

Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

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Statement of candidate

I certify that the work in this thesis entitled *Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh* has not previously been submitted for a degree and nor has it been submitted as part of a requirement for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me, except as otherwise indicated. Any help and assistance that I have received in my research work and the preparation of the thesis have been appropriately acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

All study protocols have been approved by the Macquarie University Human Research Ethics Committee, with reference number 5201200877.

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Abstract

Bangladesh is one of the most vulnerable countries in the world to cyclones and storm surges. Due to climate change, the frequency of cyclones and storm surges is expected to increase on the Bangladesh coast. These events create enormous damage and loss and increase community vulnerabilities. Over the last decade, many studies have examined how these vulnerabilities can be addressed and how the capacities of households can be strengthened to build more resilient communities. Little of this research has considered the contribution of social capital to disaster resilience and recovery in Bangladesh, and on the Indian sub-continent generally. This current research seeks to address this gap in the research by examining the contribution of social networks (particularly bonding networks – households' relationships with immediate family members and other relatives; bridging networks – households' relationships with neighbours and friends; and linking networks – households' relationships with organisations, for example, NGOs, local government and other community-based organisations) to disaster resilience and recovery.

Through a mixed methods approach using household surveys, focus groups, key informant interviews, workshops and meetings, this study examines when social networks perform strongly and poorly in disaster resilience and recovery; how households' assets enable and constrain their contributions through bonding and bridging social networks; how social networks are articulated in the disaster management policies of Bangladesh; and what opportunities there are to strengthen the capacity of social networks to contribute effectively to disaster resilience and recovery, using two coastal villages affected by Cyclone Sidr as case studies.

Findings show that bonding and bridging networks provide very important support – sharing of food and shelter, providing comfort, etc. – immediately after a disaster. As the time after the disaster increases, these networks perform less well due to households' limited physical, financial and human capital, and the uncertainties of their access to natural capital. After a period, bridging networks become less active and sometimes break down due to competition and conflict over access to external relief support. Bonding networks, however, do not break down. Household members continue contributing to the recovery process by reducing food intake, helping with alternative income and livelihood

options through temporary migration, and so on. For longer-term recovery, however, disaster victims usually need support through linking social networks – from NGOs (e.g. local, national and foreign NGOs), local government and other community-based organisations (CBOs). Their links with NGOs and local government provide households with strong support in the form of emergency relief, shelter, livelihood assistance, and reconstruction of major community services. However, while providing this support, they often engage in corruption through favouritism and taking bribes. These poor practices of NGOs and local government foster inequality, discontent and mistrust (between households, and between households and organisations), which, in the long run, harm linking relationships.

This study found that despite the importance of social capital in disaster resilience and recovery, households' social networking relationships are not given adequate emphasis in the disaster management policies of Bangladesh; and linking social networks are given greater focus than bonding and bridging networks. Within linking networks, government's links with various national, regional and international organisations and foreign states are prioritised, not households' links with local and national organisations.

This study argues that NGOs and local government should strengthen the capacity of local households to contribute effectively to disaster resilience and recovery. This can be accomplished by placing more emphasis on disaster risk reduction programs rather than simply relief works, fostering on alternative income options, providing more robust housing, and rebuilding trust through fair distribution of recovery support to build disaster-resilient communities. Through these measures, disaster-affected households would be able to reduce their dependency on the intervention of external organisations (linking social networks) to recover from a disaster. This study also suggests that disaster policies should be revised to make better use of the potential of local social capital to contribute to disaster resilience and recovery.

Keywords: Social capital, Social networks, Disaster resilience and recovery, Cyclone Sidr, Bangladesh coast.

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Dedication

To my parents, who enabled and encouraged me to start my educational life in the early 1980s from a typical Bangladeshi village. The simple step taken by my father of ‘sending me to school’ has tremendously changed my world.

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Contribution to papers

This PhD is presented in a thesis by papers form. Some chapters include stand-alone papers. These papers are published, submitted to the journals or prepared for publication, as indicated in Chapter 1. The papers included in this thesis are co-authored by the PhD candidate and supervisors. The table below summarises the respective contributions of authors to each of the papers included in this thesis.

Table of candidate's contribution to each paper contained in this thesis

Chapter	Paper title	Concept	Data collection & analysis	Writing
2	How bonding and bridging networks contribute to disaster resilience and recovery on the Bangladeshi coast	85% Rabiul 15% Greg	100% Rabiul	90% Rabiul 10% Greg
3	How households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks in the Bangladesh coast	90% Rabiul 10% Greg	100% Rabiul	95% Rabiul 5% Greg
4	How do links between households and NGOs promote disaster resilience and recovery? – A case study of linking social networks on the Bangladeshi coast	85% Rabiul 15% Greg	100% Rabiul	90% Rabiul 10% Greg
5	How local governments support households to recover from cyclones in coastal Bangladesh: an investigation of local social capital	80% Rabiul 15% Greg 5% Marco	100% Rabiul	90% Rabiul 10% Greg
6	Social networks and paradoxes in government disaster policies: how are social networks articulated in the disaster management policies of Bangladesh?	90% Rabiul 10% Greg	100% Rabiul	95% Rabiul 5% Greg

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Abbreviations and Acronyms

ABCD	Asset-Based Community Development
ADP	Annual Development Program
ADPC	Asian Disaster Preparedness Centre
ADRC	Asian Disaster Reduction Centre
ASEAN	Association of Southeast Asian Nations
AU\$	Australian Dollar
BBS	Bangladesh Bureau of Statistics
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BCCTF	Bangladesh Climate Change Trust Fund
BDT	Bangladesh Taka
BMD	Bangladesh Meteorological Department
BRAC	Bangladesh Rural Advancement Committee
CBDRR	Community-Based Disaster Risk Reduction
CBFM	Community-Based Fisheries Management
CBOs	Community-Based Organisations
CCA	Climate Change Adaptation
CDMP	Comprehensive Disaster Management Programme
CEGIS	Centre for Environmental and Geographic Information Services
Cf.	Cite From
CGI	Corrugated Galvanised Iron
CODEC	Community Development Centre
COP	Conference of Parties
CPP	Cyclone Preparedness Program
CSOs	Civil Society Organisations
DCI	Direct Calorie Intake
DDM	Department of Disaster Management
DFID	Department for International Development
DMA	Disaster Management Act
DMB	Disaster Management Bureau
DPIs	Disaster Practitioner Interviews
DRR	Disaster Risk Reduction
EPI	Expanded Program on Immunisation

FAO	Food and Agriculture Organization
FBOs	Faith-Based Organisations
FEI	Food Energy Intake
FEMA	Federal Emergency Management Agency
FFWC	Flood Forecasting Warning Centre
FGDs	Focus Group Discussions
GOs	Government Organisations
HFA	Hyogo Framework for Action
IFRC	International Federation of Red Cross and Red Crescent Societies
IGAs	Income Generating Activities
IMDMCC	Inter-Ministerial Disaster Management Coordination Committee
INGOs	International Non-Governmental Organisations
IRIN	Integrated Regional Information Networks
KIIs	Key Informant Interviews
MDGs	Millennium Development Goals
MFIs	Microfinance Institutions
MoDMR	Ministry of Disaster Management and Relief
MoEF	Ministry of Environment and Forests
MoFDM	Ministry of Food and Disaster Management
MVCs	Most Vulnerable Countries
NAPA	National Adaptation Programme of Action
NDMC	National Disaster Management Council
NGOs	Non-Governmental Organisations
NPDM	National Plan for Disaster Management
PMIs	Policymaker Interviews
PPRR	Prevention, Preparedness, Response and Recovery
PPT	Parts Per Trillion/ <i>Parts Per Thousand</i>
PSF	Pond Sand Filter
SAARC	South Asian Association for Regional Cooperation
SOD	Standing Order on Disasters
SPSS	Statistical Package for Social Sciences
TIB	Transparency International Bangladesh
Tk.	Taka (Bangladeshi currency)
UDMC	Union Disaster Management Committee
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

UNICEF	United Nations International Children’s Emergency Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UNO	Upazila Nirbahi Officer
UP	Union Parishad
US\$	United States Dollar
USAID	US Agency for International Development
VGD	Vulnerable Group Development
VGf	Vulnerable Group Feeding
WCDR	World Conference on Disaster Reduction
WDB	Water Development Board
WDMC	World Disaster Management Committee

Glossary

<i>Abashon</i>	<i>Abashon</i> is the government-funded community housing for the destitute people in the coastal areas of Bangladesh.
<i>Aksona</i> land	<i>Aksona</i> land means the one-cropped land. Due to saline water intrusion, coastal farmers can grow only one crop per annum.
<i>Aman</i>	<i>Aman</i> is a dominant rice variety in Bangladesh. It is the largest harvest accounting for more than half of the total annual production. Planting season of this rice is April to May and harvesting season is November to December (during winter).
<i>Aus</i>	<i>Aus</i> is a dwarf rice variety in Bangladesh. This is the second-largest harvest. <i>Aus</i> is sown in March to April (sometimes April to May) and harvested during July and September (during autumn).
<i>Bagda pona</i>	<i>Bagda pona</i> is the juvenile size of black tiger shrimp.
<i>Chollisha</i>	<i>Chollisha</i> is the fortieth day rituals after a human death. In this study, <i>Chollisha</i> means the fortieth day after a disaster.
<i>Chowkidars</i>	<i>Chowkidars</i> are the village watchmen – the staff of local government i.e. <i>Union Parishad</i> . They play a vital role in disseminating early warnings, search and rescue, and distributing relief goods before, during and after cyclones.
<i>Dadondars</i>	<i>Dadondars</i> are the informal moneylenders in the coastal villages of Bangladesh. They provide loans for nets and boats to fishermen, but in return, fishers are contracted to sell their catches to these moneylenders.
<i>Fitkari</i>	<i>Fitkari</i> is a Potassium Aluminium Sulphate, commonly used for water purification in the coastal villages of Bangladesh.
<i>Fitra</i>	<i>Fitra</i> is a gift of food or money that each mature Muslim individual pays on the day of <i>Eid-ul-Fitr</i> (a large religious celebration after Ramadan). It is a charitable tax to be paid to the poor people, which is obligatory in Islam.
<i>Hilsa</i>	<i>Hilsa</i> is the national fish of Bangladesh. It is the most popular and tasty fish locally known as <i>Ilish</i> . Catching <i>Hilsa</i> fish is a major livelihood option in the coastal villages of Bangladesh.
<i>Jatka</i>	<i>Jatka</i> is the younger size (smaller than 1 inch) <i>Hilsa</i> fish. Catching <i>Jatka</i> is prohibited in order to save future generations of the fish.
<i>Kaun</i>	<i>Kaun</i> is one of the species of catfish. Coastal people catch <i>Kaun</i> fish in the offseason of <i>Hilsa</i> fishing, for example, during November to mid-March

(Bengali *Kartik* to *Falgun*).

<i>Killa</i>	Raised earthen platforms used as an initial shelter for livestock.
<i>Kutcha</i> house	<i>Kutcha</i> house is made of: floor – mud; walls– bamboo, jute stick, straw; and roof – paddy/wheat straw.
<i>Longorkhana</i>	<i>Longorkhana</i> is a temporary camp with free food and shelter for disaster-affected people.
<i>Milad</i>	<i>Milad</i> is the special prayer by Imam.
<i>Musti chal</i>	<i>Musti chal</i> is a handful of rice. It is a usual practice of rural women to save <i>Musti chal</i> every day (during cooking time) in a certain pot to manage post-disaster food crises.
<i>Obarodh</i>	<i>Obarodh</i> is the time that fishing in the sea is banned (during the full-moon spawning time of <i>Hilsa</i> fish – <i>Purnima</i>) in October (Bengali month in <i>Aswin</i>).
<i>Passer daktar</i>	<i>Passer daktar</i> means the physician with a basic medical degree i.e. MBBS.
<i>Pucca</i> house	<i>Pucca</i> house is made of brick, cement and CGI sheets.
<i>Pucca paikhana</i>	<i>Pucca paikhana</i> is the sanitary latrines.
<i>Rikshaw</i>	<i>Rikshaw</i> is the three-wheeled passenger cart in the city areas of Bangladesh. This is one of the prime sources of income for poorer urban people.
Saudi House	The houses that were a donation from the Saudi Government after Cyclone Sidr in 2007, locally known as “Saudi House”.
Semi-pucca house	Semi-pucca house is made of: floor – mud, brick or cement; walls – bamboo mats, timber, CGI sheets; and roof – CGI sheets.
<i>Union Parishad</i>	<i>Union Parishad</i> is the lowest tier of local government in Bangladesh.
<i>Upazila</i>	<i>Upazila</i> is an administrative unit (sub-district) of local government in Bangladesh.

Chapter 1: Introduction

This study aims to explore the contribution of social capital to disaster resilience and recovery on the Bangladesh coast. It is intended that the knowledge generated from this study will provide new insights and information to the growing body of social capital and disaster literature. This research uses a mixed methods approach to determine the answers to the research questions. Several sampling techniques are used to select the research participants – for example, household-heads are selected randomly, and focus groups and local key informants are selected purposively. The national key informants (disaster practitioners and policymakers) are selected through following a snowball sampling technique. Two Bangladeshi coastal villages, which were severely affected by the devastating Cyclone Sidr in 2007, are selected purposively as the study area.

This introductory chapter begins with a background of the issue that frames the study problem. Following the definition of the problem, social capital and disaster studies in the global, regional and Bangladesh context are explored in order to identify gaps in the research. Based on these gaps in the research, the research aim and questions are determined, which are then followed by a methodological discussion. The methodological discussion is included in the introductory chapter rather than placing it in a different chapter. This is a thesis by publication. This thesis contains some stand-alone papers (that are either published, submitted for publication, or prepared for publication), which have a separate methodology section. Therefore, avoiding redundancy, methodology section is briefly discussed in the introductory chapter.

This chapter also discusses the conceptual framework to address the research questions, the thesis argument, contributions of the thesis and the thesis structure. This chapter concludes with a table outlining where responses to each of the research questions are located within the thesis.

1.1 Introduction

The central aim of this thesis is to explore the contribution of social capital to disaster resilience and recovery. This study uses a social capital framework to explore when households' social networks (e.g. bonding, bridging and linking) contribute well and poorly; and also how the capacities of social networks can be developed to contribute effectively to disaster resilience and recovery on the Bangladesh coast. Social capital resources and households' networks are vital contributors to disaster resilience and recovery (Minamoto, 2010, LaLone, 2012, Aldrich, 2012).

Bangladesh is one of the “most vulnerable countries” (MVCs) to climate change in the world due to its geographical location, dominance of floodplains, low elevation above sea level, and high population density (Barua et al., 2010, Shamsuddoha and Chowdhury, 2007, Sarker et al., 2012, Ministry of Environment and Forest (MoEF), 2005, Alauddin and Sarker, 2014, Rashid and Paul, 2013). The United Nations Development Programme (2004) identified Bangladesh as the most vulnerable country in the world to tropical cyclones and the sixth most vulnerable country to floods. Two types of major disasters that affect Bangladesh are cyclones and storm surges, and these have subsidiary effects such as coastal erosion and salinity, which damage the homestead and cropping lands of coastal people (Disaster Management Bureau, 2010a). Bangladesh has a long history of climatic disasters. In 1970, the devastating Bhola Cyclone killed at least 300,000 people; another catastrophic cyclone was Cyclone Gorky in 1991, which killed nearly 140,000 people. Moreover, other large cyclones (in terms of human casualties) hit the Bangladesh coast in 1961, 1963, 1965 (during the East-Pakistan period), 1985 and 1988, where human deaths were 11,466; 11,520; 20,152; 11,069; and 9,590, respectively (Haque et al., 2012b). In recent years, cyclones and storm surges have become more frequent in the Bay of Bengal; a severe tropical cyclone hits Bangladesh, on average, every three years (Alam et al., 2011, Disaster Management Bureau, 2010a, Ministry of Food and Disaster Management (MoFDM), nd). For example, six major cyclones¹ hit the Bangladesh coast in the eight years from 2007 to 2014 (Bangladesh Meteorological Department, 2013). These hazards caused massive damage and enormous loss of lives, livelihoods,

¹ Six successive cyclones, for example, Sidr – 15 November 2007; Reshmi – 27 October 2008; Nisha – 28 November 2008; Bijli – 17 April 2009; Aila – 25 May 2009; and Mahasen – 16 May 2013, hit the Bangladesh coast.

infrastructure and economic assets. Bangladesh is one of the worst affected countries in the world in terms of cyclonic casualties (Disaster Management Bureau, 2010a). The high-intensity cyclones and storm surges have killed many people during 1970 to 2013 in the Bangladesh coast, which is shown in Table 1.1.

Table 1.1 Major cyclones on the Bangladesh coast

Year	Name	Wind speed (km/h)	Height (metres)	Category	Human toll
1970	Bhola	222	5.5	4	300,000
1985	Noakhali	154	3.2	3	11,069
1988	Mongla	162	4.5	3	9,590
1991	Gorky	235	6.0	4	138,000
2007	Sidr	260	5.0	5	3,406
2008	Rashmi	80	1.8	1	28
2009	Bijli	95	2.1	1	5
2009	Aila	120	4.0	2	300
2013	Mahasen	95	1.0	1	17

Source: Haque et al. (2012b), Bangladesh Meteorological Department (2013) and web sources.

Note: Cyclone category as Saffir-Simpson hurricane scale.

The coastal zone (710 kilometres) of Bangladesh hosts over 35 million people (out of 160 million) who are the prime victims of the extreme climate events through their loss of housing, properties, jobs and livelihood opportunities. The primary income source of around 0.5 million coastal households (family members 2.7 million) is fishing, and they lose working days because of rough weather in the Bay. Moreover, over 160,000 coastal fishermen and an estimated 185,000 shrimp fry collectors are involved in coastal fisheries (Disaster Management Bureau, 2010a). In addition, due to saline water intrusion, the coastal people cannot cultivate their cropping lands throughout the year – they can produce only one crop per annum (Islam and Walkerden, 2014). Therefore, cropping intensity and production levels are much lower in the coastal region than in other parts of the country (Rashid and Paul, 2013). In the other parts of Bangladesh, farming lands are cultivated almost all throughout the year, with farmers producing two to three crops per annum (Mondal et al., 2001). Thus, the coastal climate hazards result in physical, socioeconomic and ecological vulnerabilities.

Considering the frequency of disasters causing damage and loss, Bangladesh has taken significant steps to develop institutional arrangements at both national and local levels for effective disaster management and to build resilience of disaster-affected communities (Asian Disaster Reduction Centre (ADRC), 2003). The first institutional effort, the Cyclone Preparedness Program (CPP), was established in 1973. From 1973 until 1990,

disaster management was understood to be emergency response (e.g. relief) and rehabilitation. After the cyclone in 1991, the Government of Bangladesh realised the importance of disaster preparedness and felt that comprehensive disaster management is more important than the reactive response activities (Comprehensive Disaster Management Programme (CDMP), 2012). Consequently, the Disaster Management Bureau (DMB) was established in 1993. [Since November 2012, the DMB has been known as the Department of Disaster Management (DDM) under the Ministry of Disaster Management and Relief (Government of Bangladesh, 2012b)]. Following the establishment of the DMB, a Standing Order on Disasters (SOD) was formulated in 1997 (amended in 2010) (Comprehensive Disaster Management Programme (CDMP), 2012). In 2005, the National Adaptation Programme of Action (NAPA) was taken to reduce climate change impacts and incorporate potential response measures into the overall development planning process (Ministry of Environment and Forest (MoEF), 2005). The Bangladesh Climate Change Strategy and Action Plan was established in 2008 (then revised in 2009) to integrate climate change constraints and opportunities into the overall plans and programs of the country (Ministry of Environment and Forests (MoEF), 2009). In 2012, the Disaster Management Act was implemented with the aim of developing an effective disaster management structure to respond to all kinds of disasters through coordinated and objective-driven programs (Ministry of Disaster Management and Relief (MoDMR), 2012).

The Government of Bangladesh also constituted the National Plan for Disaster Management 2010-2015 in light of the Hyogo Framework for Action (HFA)² (Comprehensive Disaster Management Programme (CDMP), 2012). In 2004, the Ministry of Food and Disaster Management, with the assistance of donors, began the Comprehensive Disaster Management Programme (CDMP). After the successful implementation of the first phase of the CDMP, the second phase was launched (finishing in 2014). The goal of this program was to introduce disaster management into the

² The Hyogo Framework for Action (HFA) is a 10-year plan (2005-2015) of the United Nations Office for Disaster Risk Reduction (UNISDR) to make the world safer from natural hazards. The main goal of HFA is building the resilience of nations and communities to disasters by 2015, which means reducing loss of lives and social, economic, and environmental assets when hazards strike. It describes and details the work that is required from all different sectors and actors to reduce disaster losses. The UNISDR has already reviewed the HFA and developed a Post-2015 framework for disaster risk reduction through the Sendai Declaration (The Sendai Framework for Disaster Risk Reduction 2015-2030, Sendai, Japan 14-18 March 2015), which is activated from the end date of the HFA.

activities of the 13 associated Ministries³ and organisations, and to give disaster management a comprehensive and institutional identity (Comprehensive Disaster Management Programme (CDMP), 2012). Moreover, the government has the high-powered National Disaster Management Council (NDMC) and the Inter-Ministerial Disaster Management Coordination Committee (IMDMCC) for promoting and coordinating risk reduction, prevention and preparedness activities (Asian Disaster Reduction Centre (ADRC), 2003). Social capital is not well portrayed in all of the government's policies, programs and actions (details in Chapter 6); however, local social capital is the first responder after a disaster, it plays a role in recovery from disasters and promotes resilience, and is considered to be an asset of communities (LaLone, 2012, Nakagawa and Shaw, 2004b). To address disaster vulnerabilities, disaster-affected households usually use their various social networking relationships (bonding, bridging and linking social networks), which are discussed in Section 1.5 of this chapter.

Social capital is gradually being recognised as a pivotal contributor to disaster management (Hishida and Shaw, 2014). There is a growing body of literature which recognises the importance of social capital in disaster resilience and recovery (Chamlee-Wright and Storr, 2011, Aldrich, 2012, Islam and Walkerden, 2015, Jordan, 2015). Social capital is an important resource that enhances resilience and enables communities to promote climate change adaptation (Adger, 2003, Wolf et al., 2010), because climate change adaptation needs a collective response from a variety of actors (van Kasteren, 2014). Strong social capital has remarkably helped climate migrants to deal with crises (Aßheuer et al., 2013, Braun and Aßheuer, 2011). Social networks and social capital are important tools for coping with climate stresses and for mitigating the adverse outcomes of climate-induced disasters (Koh and Cadigan, 2008). Communities with a diverse range of formal and informal networks are more disaster resilient than the communities with fewer networks (Pelling and High, 2005). Jordan (2015) found that social capital influences resilience to climate stress in Bangladesh. Rahill et al. (2014) found the dual roles (both positive and negative) of social capital in shelter recovery after the Haiti earthquake. Communities with strong social capital (e.g. bonding, bridging and linking

³ These Ministries are: Ministry of Education, Ministry of Fisheries and Livestock, Ministry of Agriculture, Ministry of Women and Child Affairs, Ministry of Environment and Forest, Ministry of Home Affairs, Ministry of Health and Family Welfare, Ministry of Water Resources, Ministry of Local Government and Rural Development, Ministry of Energy and Mineral Resources, Ministry of Defense, and Ministry of Food and Disaster Management.

networks) and leadership promote quickest recovery and enhance collective actions in the disaster recovery process (Nakagawa and Shaw, 2004b). Social capital is also linked to community preparedness, as various social capital elements – such as social cohesion and social networks – strengthen disaster preparedness (Dynes, 2006). Linking social capital such as community-based organisations (CBOs) can help the loosely connected communities to overcome post-disaster challenges through sharing and collecting information, keeping regular contact, organising community meetings, and planning with community members (Storr and Haeffele-Balch, 2012). Aldrich (2010b) considered social capital (neighbourhood, solidarity, trust and participation) among disaster-affected communities to be a critical component of the post-disaster recovery process.

Social capital has been studied in various disaster contexts; for example, in the context of the Indian Ocean Tsunami (Sakamoto and Yamori, 2009, Aldrich, 2011b, Berke et al., 2008, Minamoto, 2010, Munasinghe, 2007, Joshi and Aoki, 2014), Hurricane Katrina (Chamlee-Wright and Storr, 2011, Hawkins and Maurer, 2010, Storr and Haeffele-Balch, 2012, Beaudoin, 2007, Airriess et al., 2008, Weil et al., 2012) , and wildfire (Cox and Perry, 2011). It has also been discussed in the context of regional events, such as climate change in the Philippines (Allen, 2006), floods in Japan (Mimaki and Shaw, 2007), and Cyclone Nargis in Myanmar (Calkins and Win, 2013). Several studies have also explored social capital in the context of earthquake disasters; for example, Nakagawa and Shaw (2004b) (Kobe and Gujrat earthquakes), Zhao (2013) (Wenchuan earthquake), Fleming (2011) (Chilean earthquake), Bhakta Bhandari (2014) (Kathmandu Valley earthquake), Aldrich (2010b) (Kobe earthquake), Rahill et al. (2014) (Haiti earthquake), and Aghabakhshi and Gregor (2007) (Bam earthquake, Iran).

There is a lack of research on “social capital and disasters” in the context of Bangladesh. Only two studies on this issue in the Bangladesh context have been found. First, Rotberg (2010) discussed the contribution of key individuals (as a linking network of local households) to adaptability to floods and river erosion in rural Bangladesh. Second, Jordan (2015) examined the roles of social capital in disaster resilience after Cyclone Aila in Bangladesh. Some literature exists on climate change and cyclones in Bangladesh, which concentrated on diverse issues related to cyclones and storm surges. Some of the studies focused on indigenous/local knowledge (Paul and Routray, 2013,

Firoz, 2010, Anik and Khan, 2012), health and nutrition (Ray-Bennett et al., 2010, Paul et al., 2012), vulnerability and response (Alam and Collins, 2010), warning signals and evacuation (Paul, 2012, 2009, Haque, 1995), and livelihoods and physical infrastructure (Mallick et al., 2011a). Others described corruption (Mahmud and Prowse, 2012), local adaptation and coping strategies (Mallick et al., 2009, Paul and Routray, 2011b, Roy et al., 2013), and people's migration (Ahsan et al., 2011a, Kellett et al., 2014, Naser and Afroz, 2009, Naser, 2015, Mamun Rashid, 2013, Mallick and Vogt, 2012). None of the research has focused on social capital and disaster recovery as their primary objective. Few of the studies have discussed the coping capacity of local households (Mallick et al., 2009, Paul and Routray, 2011a), or institutional and community responses (Alam and Collins, 2010) as the cross-cutting issue of social capital. These facts and findings imply that there is a lack of empirical research on "social capital and disasters" in Bangladesh.

1.2 Research gap

This study recognises that existing literature dealing with disasters in the context of Bangladesh does not adequately focus on the role of social capital. Local social capital and households' networks were sufficiently discussed in the literature of regional and global disaster events, for example, the Indian Ocean Tsunami in 2004 (in the affected-country specific context e.g. India, Sri Lanka, Indonesia and Thailand), Hurricane Katrina in 2005 (New Orleans, USA), and the Kobe earthquake in 1995 (Japan). However, the social capital discussion is not contained in the literature covering the large disaster events of Bangladesh, for example, Bhola Cyclone in 1970, Cyclone Gorky in 1991 and Cyclone Sidr in 2007, and the floods in 1988 and 1998. Moreover, global disaster literature has not focused specifically on Bangladeshi events.

A number of studies have been conducted in Bangladesh that look at different aspects of cyclones and storm surges. These aspects are, for example: prevention and preparedness (e.g. coping strategies, infrastructure, livelihoods, etc.), and response and recovery (early warning, evacuation, relief, etc.). However, most of the disaster literature relating to Bangladesh neglects the social capital discussion. Therefore, research and literature on the contribution of social capital to disaster resilience and recovery is lacking, because post-Sidr studies did not focus on social capital directly. Considering this gap in the literature,

several social capital and disaster studies in the context of Bangladesh have suggested that further research needs to be carried out on this issue. For example, Rotberg (2010) advised that further research is needed about the role of bonding social capital and the pathways to strengthening local social capital to withstand climate change impacts. In addition, Jordan (2015) noted that the climate change research community could reflect on the strengths and weaknesses of social capital in their research to fill the gap of limited in-depth research on the specific role of social capital in improving resilience and recovering from a disaster. Hence, a critical evaluation of social capital is essential to understanding its role in climate change adaptation (Jordan, 2015), meaning that the current research is valid and significant. Therefore, based on the qualitative and quantitative data, this study aims to fill this gap in the literature by exploring the role of social networks in disaster resilience and recovery on the Bangladesh coast. This investigation is important for the global research community, as it explores the experiences of Bangladeshi coastal households in their recovery from cyclones. This inquiry will also help researchers and other climate-vulnerable countries to understand how the people of a highly climate-vulnerable country like Bangladesh cope with extreme climate events through using their social networking relationships (bonding, bridging and linking networks). [Bangladesh is one of the most vulnerable countries in the world to tropical cyclones and floods (Section 1.1)]. The experiences of Bangladeshi households in coping with disasters are also important for the sub-continent countries – such as India, Pakistan, Nepal and Myanmar – as their socioeconomic contexts, cultures, institutional interventions and hazards are very similar to those of Bangladesh.

Previous research on social capital and disaster recovery has tended to focus on social networks as a source of necessary assistance, with most emphasising linking social networks (i.e. organisations). However, the primary focus of this study is to explore the contribution of bonding, bridging and linking social networks to disaster recovery rather than just focusing on one individual aspect of social networks, for example, either bonding *or* bridging *or* linking. In addition, considering the climate vulnerability and frequency of cyclones on the Bangladesh coast, there exists the need for a more empirical study to explore the strengths and weaknesses of local social capital in contributing to disaster resilience and recovery. This empirical research is necessary for the government, non-government organisations (NGOs) and other key stakeholders to establish appropriate

policies and programs to strengthen the capacity of local social capital. The lack of empirical research results in a significant gap in information for disaster practitioners and policymakers, necessary to develop appropriate policies and strategies for disaster recovery and to promote resilience through using local social capital. This study identifies the following gaps:

1.2.1 Database

There is a significant amount of literature in the existing database (e.g. Google Scholar and Scopus), for example, “social capital” and “resilience” (57,600), “social networks” and “resilience” (70,700), “social network” and “resilience” (36,600), and “social capital” and “recovery” (47,200). But fewer papers have both “social capital” and “resilience and recovery” (620), and “social capital”, “resilience and recovery” and “Bangladesh” (73) (as of 22 June 2015).

1.2.2 Literature and study approach

Most of the literature is based on conceptual analysis rather than empirical data. Most of existing empirical studies are either purely quantitative or purely qualitative; most are quantitative, and there is less focus on mixed methods. The current study is an empirical study that uses a mixed methods approach, which enables a more robust assessment of social capital and disaster resilience and recovery than does a single method approach.

1.2.3 Insight

The Bangladesh coastal area is home to the poorer communities. They have less physical and financial capital and lots of uncertainties in their access to natural capital. Therefore, there is a need for more empirical research in the context of coastal Bangladesh to determine possible ways of strengthening household capacities for building disaster resilience. This empirical research will help to generalise the overall recovery conditions of coastal villages in Bangladesh. The experience of poor coastal villages will also be useful in the contexts of other countries (e.g. India, Myanmar and Sri Lanka) who face similar disasters to the Bangladesh coast.

The current study addresses these gaps in the literature and research approaches, and the lack of existing research in the context of Bangladesh.

1.3 Research aim and questions

The main objective of this study is to explore the contribution of households' social networking relationships to disaster resilience and recovery on the Bangladesh coast. The following research questions are considered in the process of fulfilling the main goal of the study (e.g. to explore the contribution of social capital to disaster resilience and recovery) and in answering specific concerns or issues within the research questions (e.g. the detailed research questions). The questions are developed from the prevailing interests of social capital and disaster literature (based on the research gaps and community needs identified through the social capital discussion in the literature on disaster resilience and recovery), from a social capital framework, and from the problem of climate change and disasters in the context of coastal villages of Bangladesh. The research questions assist the researcher in understanding the focus of the research and establishing the context of the work (through answering the “what” question). These questions also help to establish why someone else would be interested in this work (through answering the “so what” question). These questions are linked to the concerns of the larger research and disaster-affected communities; they might be interesting to that larger community and also contribute to the wider conversation of social capital and disaster resilience.

To acquire the specific information necessary to satisfy the research aim, the research questions of this study are:

1. When do social networks (e.g. bonding, bridging and linking) perform well and poorly in disaster resilience and recovery?

This research question is addressed in Chapter 2 (*Paper 1 – Bonding and bridging networks*), Chapter 4 (*Paper 3 – Linking networks, NGOs*), and Chapter 5 (*Paper 4 – Linking networks, local government*).

2. How do households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks?

This research question is addressed in Chapter 3 (*Paper 2 – Households' assets*).

3. How are social networks addressed in the disaster management policies of Bangladesh?

This research question is addressed in Chapter 6 (*Paper 5 – Policy analysis*).

4. How can social networks' capacities be developed to contribute effectively to disaster resilience and recovery?

This research question is addressed in Chapter 8 (*Conclusion – Policy implications section*), and also the policy implications sections of each paper in Chapters 2–6.

1.4 Towards a theoretical framework: framing the issue

Over several decades, social capital has gained prominence as a means of understanding the dynamics of individual and community resources (Hawkins and Maurer, 2012). Social capital describes the relations that knit together communities through a sharing of trust (Callahan, 2005). This section establishes a conceptual framework for understanding the relationships between social capital and disaster resilience and recovery. The notion of social capital used in this thesis originates from the work of three main contributors to this field of study: Bourdieu (1984), Coleman (1990) and Putnam (1993); their works on social capital underpin this study. From a household perspective, this thesis understands social capital as the households' social networking relationships with people (e.g. family members, relatives, neighbours and friends) and organisations that, amongst other things, function as a resource for them – both in general, and specifically when coping with disasters. These networks combine ties, norms and trust. Discussions of the conceptual understanding of social capital and social networks are also provided in Chapters 2–6, as they are stand-alone papers. The social capital concepts of Bourdieu, Coleman and Putnam are discussed below.

1.4.1 Bourdieu

The sociologist Pierre Bourdieu defined the concept of social capital as the real or prospective resources which are linked to “possession of a durable network of more or less institutionalized relationships” or to membership of a group (Bourdieu, 1986b, p. 249). These relationships (within an organisation and/or a group/community) are evident during and after disasters through the exchange of material and immaterial support (cash, shelter, comfort etc.). These relationships may also be socially identified and guaranteed by a

common name (e.g. the name of a family, a class, or a tribe or of a school, and a party) (Bourdieu, 1986b). Bourdieu emphasises the potency and contingency of social capital as:

“An attribute of an individual in a social context. One can acquire social capital through purposeful actions and can transform social capital into economic gains. The ability to do so, however, depends on the nature of social obligations, connections and networks available around them” (Bourdieu, 1986b, cf., Sobel, 2002).

Social capital, for Bourdieu, is intimately linked to other forms of capital, for example, “cultural capital”⁴ (socially constructed qualifications of one sort or another), and “symbolic capital”⁵ (prestige or honour), which enter significantly into the formation and reproduction of class (Harriss, 2002). Pelling and High (2005) argued that Bourdieu used the concept of social capital as a part of a theory of social stratification. Bourdieu introduced social capital to highlight social ties that are used by elite groups to reproduce their privileged status. For Bourdieu, social capital is one of four forms of capital, the others being economic, cultural and symbolic capital. These four main forms of capital are unevenly distributed in the community, and interact to determine each individual’s position within social and economic – and even geographical spaces (Meyer, 2013).

Bourdieu offered a relatively early approach to social capital that highlights how social ties can be seen as “collectively-owned capital”, which can be obtained through a network or from membership of a group (Miller, 2007). This definition clearly identifies social capital as an interaction-based concept existing within social connections (Meyer, 2013). The key insight of Bourdieu’s discussion is that social capital is social resources that can be attained through the social networking relationships and ties within a household, group, community or a place.

⁴ This study considers “cultural capital” as community’s “norms of reciprocity” or cultural practice through which disaster-affected households help each other at the early recovery phase after a cyclone.

⁵ This study found few instances of “symbolic capital” practised in the coastal villages of Bangladesh. For example, one school teacher refused to take “relief goods” after a cyclone, as he thought this was disgraceful for him as a dignified individual in the society, though his household members suffered a lot due to the cyclone. On the other hand, to maintain a distinguished status, in a few cases “rich people” did not want to mix with the poor, and sometimes they were reluctant to maintain neighbourhood relationships in the coastal villages of Bangladesh. Therefore, the relationships of poor coastal people are mainly “horizontal” (i.e. between poor neighbours) (Fieldwork 2013).

1.4.2 Coleman

A rational-choice theorist, Coleman (1988) introduced the concept of social capital in a “micro-socioeconomic framework” (cf. Jordan, 2011). Where Bourdieu focused on the existence of social networks, Coleman understood social capital in a functional way, stating that:

Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: they all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure (Coleman, 1990, p. 302).

This definition implies that social capital assists individuals (through material and immaterial support⁶) within a social structure. In contrast to Bourdieu, Coleman interprets social capital as a functional concept that applies broadly (people receive benefits and opportunities wherever they are located in social strata e.g. with respect to race, caste, religion, gender, wealth etc.) (Bridge et al., 2009). Callahan (2005) argues that social capital has its dark side: “civil social capital” (e.g. political parties) can function in a very biased way – including or excluding groups of people on such bases as corruption, ethnocentrism and sectarianism. In other words ‘social capital in civil society’ may be very uncivil: *not* embodying social connectedness and civic engagement based on equity and trust.

Coleman (1988, 1990) emphasised the significance of trust and norms of reciprocity, which create “networks of obligations and expectations” within social relationships. Through these relationships, information is exchanged, and norms and mutual support are evident. Coleman (1990) considered trust, norms, social organisations (such as sources of help through linking social networks when disaster strikes) and information channels as several forms of social capital through which community members receive benefits in diverse ways (d'Hombres et al., 2010, Lucini, 2013).

⁶ These were evident in the disaster-affected coastal villages of Bangladesh where affected households received material (e.g. emergency relief goods) and immaterial (emotional care) support through their networking relationships from immediate family members, relatives, neighbours and friends, and organisations (e.g. NGOs and local government).

Coleman, like Bourdieu, viewed social capital as a productive resource that exists within networks but, unlike Bourdieu, he emphasised mutual trust, information channels and effective social norms as forms of social capital (Chamlee-Wright and Storr, 2011). Although social capital is a broad term encompassing a variety of structures, emerging from a variety of sources, and serving a variety of purposes, as Woolcock (1998) argued, a consensus has appeared in the literature regarding that social capital is the networks, norms and trust that individuals and groups (especially households) use to attain their goals and fulfil their needs (Chamlee-Wright and Storr, 2011); this is the understanding of social capital that is used in this thesis.

1.4.3 Putnam

In this vein, political scientist Robert Putnam defined social capital as “features of social life – networks, norms, and trust that enable people to act together more effectively to pursue shared objectives” (Putnam, 1995, p. 67). This definition provides three distinct elements of social capital: norms of reciprocity, trust, and networks that facilitate coordination and cooperation for mutual benefit (Berke et al., 2008). Likewise, Woolcock and Narayan (2000a) understood social capital to be the norms and networks that enable collective action.

Bourdieu highlighted “institutionalized relationships of mutual acquaintance and recognition”, and found class “distinction” to be a more important “resource” than trust in his social capital discussion (Farr, 2004, p. 9). Coleman emphasised social capital as an asset of social structure, not individuals. Putnam has figured so centrally in contemporary discussions of social capital and has clarified his definition – the notion of social capital can be broken down into key elements, notably networks, norms and trust. Putting these elements (i.e. networks, norms and trust) together, Farr (2004, p. 9) conceptualised social capital as:

The network of associations, activities, or relations that bind people together as a community via certain norms and psychological capacities, notably trust, which are essential for civil society and productivity of future collective action or goods, in the manner of other forms of capital.

This current study primarily follows Putnam's definition of social capital (Putnam, 1995) and understands the notion of social capital as the norms of reciprocity, social networks and trust within and amongst the households in the community, and between the households and organisations.

This definition is illuminating in studies of how coastal villages in Bangladesh cope with disasters. For example this study found the *norm of reciprocity* was practised through sharing of food, shelter and information and mutual works within the community after a cyclone. Due to *trust* and strong ties, family members and relatives provided support to the disaster-affected households in both the early and long-term recovery phases. However, *mistrust* between households and neighbours was created through competition and conflict to receive benefits from their linking *networks* (Bourdieu, 1986b, Coleman, 1990, Putnam, 1995), notably, NGOs and local government. In addition, unfair distribution of recovery support through NGOs and local government also created *mistrust* between households and organisations.

The social capital of individuals, groups and communities can each be analysed is understood at the individual, group and community contexts. Social capital articulates links between these different resolutions of analysis (Schuller et al., 2000), as it exists at the micro level (individual – in this study, households) (Burt, 2009), meso level (groups, and other community members such as neighbours and friends) (Coleman, 1982), and macro level (society/community, and organisations) (Putnam, 2000). This study analyses households' social capital, because households are the primary unit of analysis in this study. In Bangladeshi villages, the household-heads make major economic, social and recovery decisions after a disaster, together with household members; household-heads represent their family members in most data collection in this study (Paul, 1998b). In this study, individuals' resources (e.g. gold ornaments of women, poultry and livestock, and cash), skills, income opportunities, links with external organisations (e.g. membership to community groups, NGOs, local government, political parties, and cooperatives) etc. are part of households' capital.

Social networks are a crucial embodiment of social capital. Lin (1999) resonantly said that social capital is rooted in social networks and social relations. In this study, the aspect

of social capital focused on is social networks. Contributions of norms and trust are integral to how networks operate. Networks depend on norms and trust, and the existence of norms and trust implies networks. Because social networks are the focus of this study, and because “social capital” necessarily involves the presence of “social networks”, the two terms are used interchangeably within this text as they are in other studies (e.g. Aldrich, 2012, Zakour, 2008). When “social capital” is mentioned, it is particularly referring to “social networks”, and when “social networks” are mentioned, the term is referring to the other aspects of social capital, because the networks imply their existence. Networks can be described at many resolutions. This study takes households as the primary unit of analysis, because in Bangladeshi villages, relationships amongst household members are very tight, and in many aspects of disaster recovery, households act as a unit led by the household-head (Paul, 1998a).

1.5 Types of social capital

There are three distinct types of social networks (bonding, bridging and linking) found in the social capital literature (Woolcock, 2001, Putnam, 2000). *Bonding networks* are discussed within households (micro context), *bridging networks* are understood between households and neighbours (meso context), and linking networks are discussed between households and organisations (macro context) in the study villages.⁷ In the light of existing social capital literature, this study understands bonding, bridging and linking social networks as follows.

1.5.1 Bonding networks

Putnam (2000, p. 22) described bonding social capital as “undergirding specific reciprocity and mobilizing solidarity” among homogeneous individuals (which Putnam sees as inward-looking relationships, see Table 1.2). This study uses Putnam’s understanding of bonding capital, as norms of reciprocity (e.g. sharing food, reducing food intake by household members, sharing shelter and relief information) and solidarity (e.g. providing emotional care, repairing shelter, mutual works for reviving livelihoods, selling

⁷ Based on the households’ relationships of Bangladeshi coastal villagers, this study understands bonding, bridging and linking networks differently from the analysis of existing literature, which is discussed in detail in Chapter 2 (bonding and bridging paper), and Chapters 4 and 5 (linking network papers i.e. NGOs and local government).

labour) are found within the bonding networks (e.g. immediate household members and other relatives) in the coastal villages of Bangladesh. Bonding social capital is based on persistent and personal inward-oriented networks and is created between people who share similar characteristics (demographic, social, ethnic, etc), such as immediate family members, neighbours, close friends, and business associates (Bridge, 2002, Wuthnow, 2002, Woolcock and Narayan, 2000a). This definition understands family members, neighbours and friends as bonding social capital. The current study differs, with this point based on the households' perspectives and nature of contribution of family members, neighbours and friends after a disaster; the ties that households have with family members are not the same as those they have with neighbours and friends. Therefore, this study understands *bonding networks* as households' relationships with immediate family members and in-laws. Instead, the neighbours and friends are considered as *bridging networks* in this study, because households' relationships with neighbours and friends are a kind of bridge/link for households outside the immediate household environment.

Beaudoin (2007) stated that a bonding social network involves social connections that reinforce exclusive identities and homogeneous groups, such as people of the same ethnicity or same socioeconomic status. A bonding social network refers to the strong social links that exist between like-minded individuals in homogeneous groups – the networks comprised of immediate family members, or close friends, or group members (Healy and Hampshire, 2002). These definitions highlight two key aspects – *social connections* and *strong social links*. This study understands that these two aspects are not part of bonding networks, because “social connections” and “social links” (e.g. households' or individuals' relationships with other individuals/households or organisations in their *social* life) are involved with the concept of *bridging and linking social networks*. “Social connections” and “social links” were evident within the bridging and linking social networks in the study villages, where households have social connections and links with neighbours and friends, and organisations (e.g. NGOs and local government). Cattell (2001) identified that bonding social capital contributes to quality of life by promoting mutual understanding and support between people within households and communities. Bonding ties are considered more as an important component of coping with climate change impacts (Adger, 2003), as through these networks, households usually share information, food and shelter during disasters and work collectively to

recover from a disaster. Brisson and Usher (2005, p. 645) stated that “bonding social capital is the network of trusting relationships, or social cohesion and trust, among members of a neighbourhood”. This definition provides two important components of social capital – *trust* and *cohesion*. The current study agrees with this discussion, as strong trust and solidarity is found within bonding social networks in the coastal villages of Bangladesh.

1.5.2 Bridging networks

Bridging social networks “encompass(es) people across diverse social cleavages” (Putnam, 2000, p. 22), which Putnam sees as outward-looking relationships of households (see Table 1.2). In agreeance with Putnam’s understanding of *outward-looking relationships*, this study understands *bridging social networks* as households’ relationships with neighbours and friends, which are, in fact, “outward-looking relationships” of households, outside the household territory. Bridging social capital, which forms in the presence of weak ties, involves inclusive social connections with people from different social groups (Beaudoin, 2007). This study also agrees with the point that bridging social networks are comparatively *weak ties* compared to bonding networks. *Bridging network* describes the ties among people from different ethnic, geographical and occupational backgrounds but with similar economic status and political influence (Woolcock, 2002).

During crises, bridging social capital can increase solidarity and cohesion and can provide crucial networks for mutual support among groups that have common interests (Jordan, 2011). It is mainly based on relatively weaker and impersonal external networks between diverse people and institutions (Bridge, 2002, Wuthnow, 2002). Healy and Hampshire (2002) stated that bridging networks are characterised by both formal and informal relationships as well as strong and weak ties, which is vital for linking individuals and communities to resources or opportunities outside their personal networks. Brisson and Usher (2005, p. 645) defined bridging social capital as the “trusting network of relationships between members of a neighbourhood and outside organizations and institutions. The network’s view attends to both intra- and extra-community relationships’.

1.5.3 Linking networks

Linking social networks are different from bonding and bridging networks, as they involve vertical ties rather than horizontal. Woolcock (2002) defined linking social capital as the ties between community and organisations such as banks, government and non-governmental offices, schools, and housing authorities. It refers to households' alliances with individuals or groups to gain access to resources needed for social and economic development. Linking networks (e.g. households' connections with government officials, policymakers, business community, political leaders, and service provider organisations, etc.) enable individuals and communities to speak directly to formal decision-makers and support providers rather than have their views expressed through others (cf. Healy and Hampshire, 2002).

Linking social capital improves the effectiveness of institutions by providing opportunities and support for individuals, groups and communities. This support distribution process creates the potential for increasing appropriateness, accountability and transparency of organisations (Healy and Hampshire, 2002). Aldrich (2011b) found that disaster-affected villages with high levels of linking social capital (tightly linked to outside organisations) received greater amounts of post-disaster recovery aid more quickly than communities which possessed only bonding capital. However, sometimes less accountability and transparency is found within organisations during distribution of relief support after a disaster, as the organisations (e.g. NGOs and local government) often favour (e.g. include specific groups of people) and disfavour (e.g. exclude some other groups of people) some parts of the community (Islam and Walkerden, 2014). Similarly, Aldrich (2011b) found that minority groups and outcasts were often excluded from receiving assistance after the Tsunami in India.

Linking social networks are the most important network for the poor households and for the betterment of the economic environment (Nakagawa and Shaw, 2004b). For example, during disasters, bonding and bridging social networks might work as a very fragile safety net (as they cannot be supported long-term). In such circumstances, linking social capital plays a critical role in reducing vulnerability (through structural and non-structural mitigation activities), strengthening livelihoods (through providing income opportunities,

microcredit and livelihood assistance, for example, fishing nets and boats and farming seeds), and making a safer and more sustainable environment through providing various forms of support (Nakagawa and Shaw, 2004b). However, Woolcock (2002) observed that poor people tend to have strong bonding social capital and some level of bridging capital, but little linking social capital. In the current study, this was also found to be the case in the study villages where households' relationships were mostly horizontal (bonding and bridging relationships between poor households), and less vertical (between households and organisations and between poor households and rich households). Based on the above discussion, definitions of bonding, bridging and linking social networks are presented in Table 1.2.

Table 1.2 Types of social networks and their nature

Social networks	Main theme	Nature
Bonding	Relationships between family members, close friends and neighbours	Inward-looking horizontal relationships
Bridging	Relationship between more distant friends, associates and colleagues	Outward-looking horizontal relationships
Linking	Relationships with official organisations to gain access to resources, information and intellectual capital	Vertical relationships

Source(s): Adger (2003), Woolcock (2001) & Putnam (2000).

This study does not follow the conventional definitions of bonding, bridging and linking social networks, rather, it redefines these networks based on households' experiences and the nature of networking relationships to acquire post-disaster recovery support in the coastal villages of Bangladesh. In this study, *bonding social networks* are defined as the households' relationships with immediate family members and other relatives who provide continuous assistance (e.g. food, comfort, labour, cash, etc) to the households' recovery process after a disaster. This relationship does not break down due to their strong ties and trust.

This study defines *bridging social networks* as the households' relationships with neighbours and friends who provide support after a disaster by sharing food, shelter and information, and mutual works/collective efficacy at the early recovery phase (up to one month after a disaster). At the longer-term recovery phase (from one month up to several years after a disaster), this network does not continue support; it becomes weak and

sometimes breaks down due to conflict and competition to get access to the external benefits.

Finally, *linking social networks* are defined as the households' relationships with organisations – for example, NGOs, local government and other CBOs – through which disaster-affected households receive emergency relief, shelter and livelihood assistance (Islam and Walkerden, 2014). However, during distribution of recovery support, linking social networks (e.g. NGOs and local government) are often involved in favouritism and corruption, which creates mistrust between households in the community, and between households and organisations.

The existing literature considers “family and neighbours” as the “bonding capital”. However, this current study understands that the support that disaster-affected households receive from “family members” is not the same as that which they receive from “neighbours” – there is a significant difference in the support that immediate family members and relatives provide, and the support that neighbours and friends provide. From a household perspective, family members are more inclined to assist their households, and their contribution to the recovery process is stronger/larger than the contribution of neighbours. In addition, considering the “household as a unit of analysis”, this study defines social capital through “inward-looking relationships” (inside households i.e. bonding), and “outward-looking relationships” (outside households, i.e. bridging and linking). The details behind the clarification of these networks are provided in Chapter 2 (bonding and bridging networks paper), and Chapters 4 and 5 (linking networks papers i.e. NGOs and local government).

1.6 Elements of social capital

Lin (1999) stated that the notion of social capital contains three ingredients: resources embedded in a social structure; accessibility to such social resources by individuals; and use of such social resources by individuals through a purposive action. Thus conceived, social capital contains three elements intersecting structure and action: the structural (embeddedness), opportunity (accessibility), and action-oriented (use) aspects (Lin, 1999). Despite Lin's conclusion on social capital elements, most social literature identifies three

common elements of social capital – norms (Coleman, 1988, Putnam, 1995, Fukuyama, 2001), trust (Coleman, 1988, Putnam, 1995, Fukuyama, 2001), and networks (Bourdieu, 1986b, Putnam, 1995, Burt, 2009). These elements are important in the community context. LaLone (2012, p. 211) resonantly stated that:

Social capital refers to the resources of support that are embedded within social networks, and that are cemented and reinforced through relationships of trust and social norms emphasizing reciprocity and mutual assistance.

The key elements of social capital are discussed below.

1.6.1 Norms

Norms are a collective behaviour, collective societal expectations, and collective reactions to behaviour (Gibbs, 1965). Norms encompass values, rules and expectations that exist within a social group and community (Halpern, 2005). Sociology literature considers a “norm” as a statement of members of a group. It is an abstract pattern that sets certain limits for behaviour (Gibbs, 1965). Social norms are initially created among individuals and can eventually become “generalised” norms, accepted by the vast majority of the community or even formalised in law (Benson, 1993). Social norms and social capital are closely related, as social capital can serve as a source of social norms (Chalupnick, 2010), which are practised through households’ networking relationships in the community.

Norms can be legislative, cultural or behavioural and decisively influence the functioning of human society and the interactions between society and nature, or within social-ecological systems (Folke, 2006). It can not only guide individuals through certain rules and practices, but larger organisations and whole societies too (Birkmann and von Teichman, 2010). Through social norm two main outcomes are found: first, a community can sustain cooperation (e.g. sharing food, shelter, information, emotional care during and after a disaster) even when each agent knows nothing more than their personal experience; and second, the community can realise any mutually beneficial outcomes (e.g. mutual works/social cohesion, and collective efficacy after a disaster) when each agent carries a label such as reputation, membership and neighbourhood (Kandori, 1992). The norm of

reciprocity is actively observed during a disaster. For example, Weil et al. (2012) found evidence of reciprocity after Hurricane Katrina where neighbours helped their neighbours and the community responded to fulfil each other's needs as their usual social expectation. From a social capital perspective, "solidarity" and "reciprocity" are particularly important norms (Aßheuer et al., 2013) that are highly evident in the community after a disaster⁸.

This study understands *norms* as the practice of reciprocity or share of mutual benefits within the households (immediate family members and relatives), between community members (neighbours and friends), and with organisations (NGOs, local government, other CBOs, and Faith-Based Organizations (FBOs)).

1.6.2 Trust

Trust is a crucial component of social capital, necessary for sustaining economic vitality and performance of government, NGOs, and the community (Putnam et al., 1994). Trust is "confidence in the reliability of a person or system, regarding a given set of outcomes or events" (Giddens, 2013, p. 34). It is established or increased as a by-product of networks and shared values (Fukuyama, 1996, cf. Muir, 2011). In many ways, trust is linked to hazards and disasters. For example, social trust can make people familiar with the hazard, and make hazard information available to the community through providing credible early warnings. Trust in the civic agencies can enhance risk communication and influence the community to take hazard preparedness (prevention/mitigation for effective disaster risk reduction). Organisations' capacity to engage local people with hazard mitigation activities depends on the level of *community trust*⁹ towards the organisations (Paton, 2007).

Trust has many social implications. First, "mutual trust" works as an "effective information channel" that can create effective social norms in the community (Bourdieu,

⁸ The practices of norms of reciprocity were found in the coastal villages after cyclones, where villagers shared foods, shelter and information, and engaged in mutual cooperation through collective efficacy and emotional care.

⁹ Due to the low level of trust in the early warning provider organisations, many people did not follow the warning signals before Cyclone Sidr in the coastal villages of Bangladesh, as the organisations sometimes fail to provide credible early warnings. There was also mistrust created between villagers and relief provider organisations (e.g. NGOs and local government) due to favouritism and corruption during distribution of relief support to the affected community.

1986b). For example, households within the study villages shared relief and recovery information among them immediately after a disaster due to their mutual trust, social norms and connectedness. In contrast, this mutual trust often declined at the long-term recovery phase when households engaged in competition to get access to the external recovery support. Thus, mistrust was created among the neighbours, and during this time, quite often, households did not share information with other households. Second, “interpersonal trust and norms of civic cooperation” and “economic performance” of a community are positively related (Knack and Keefer, 1997). For example, in the study villages, during the crisis after Cyclone Sidr, some affected households received loans (with and without interest) from neighbours and friends based on the “interpersonal trust” (meso-level horizontal trust). Similarly, due to trusting relationships between households and organisations (macro-level vertical trust), NGOs provided microcredit as a form of livelihood support (e.g. to recover farming activities and fishing, small business, rearing poultry, fish cultivation, etc.), which increased the economic activities in the community after a disaster. Third, Putnam (1995) concluded that a decline in social capital leads to civic disengagement and widespread distrust in democratic institutions (Chamlee-Wright and Storr, 2011). For example, distrust between community people and civic democratic organisations like local government is evident in the coastal villages of Bangladesh, while local government representatives engage in favouritism and corruption during distribution of post-disaster recovery support among the victims.

Trust also lubricates cooperation in a society. Due to trustworthy relationships, most of the flood-affected people felt safe and could lend money to neighbours in Bangladesh (Aßheuer et al., 2013). Trust reduces the transaction costs between people and the organisations, which saves money and time, and creates a social obligation (Pretty and Ward, 2001). For example, based on trust, NGOs are running their microcredit programs in the rural areas of Bangladesh. Through a volunteer leader of a microcredit group (also known as a group leader), NGO workers provide loans to the group members and collect instalments (repayments) without any service cost. Local people consider this trusting relationship between the group members and NGO workers as a social obligation. Fukuyama (1996) said that trust encourages cooperation and cooperation creates trust in a steady development of social capital. Nakagawa and Shaw (2004b) found community’s

trust of political leaders and community leaders helps to progress disaster resilience and recovery activities. Though, this trust should be reciprocal.

This study understands *trust* as the nature of confidence (e.g. households' confidence in the family members) and reliability (on the neighbours, friends and organisations) among people and organisations in the community. Confidence and reliability were found (or declined) within households, among the neighbours, and between households and organisations (NGOs and local government) in the coastal villages of Bangladesh after a disaster.

1.6.3 Networks

The theoretical development of social networks did not advance quickly until the emergence of the concept of social capital (Zhao, 2013). Putnam (2000) defined social networks as people's embeddedness or engagement in the community. "A social network is defined as a set of socially linked or interconnected discrete individuals or groups, as well as the structure, number and character of the relationships that link members of the network" (cf. Hawkins and Maurer, 2012, p. 355). Social networks have several features: first, structural or morphological aspects (e.g. size, centrality, directionality, density, and direct and indirect contacts), and second, interactional aspects (e.g. role composition, reciprocity, value of relationships, and frequency of contact) (Wasserman, 1994). Quality of networking relationships and mutual exchanges within a network can be understood through the nature and extent of social support (Hawkins and Maurer, 2012).

Varda et al. (2009) commented that networks can be at the individual (e.g. networks within household members), community (e.g. networks between neighbours and friends), and organisational levels (e.g. networks between households and organisations or networks between organisations). Organisational networks can be through memberships and links; for example, membership of FBOs (e.g. mosques, temples, cooperative associations), government (local government, central government) and NGOs, business organisations, sporting associations, community-based organisations, and workplace relationships (George, 2013).

Networks are linked to promote disaster resilience and recovery. For example, Murphy (2007, p. 302) found that “people with strong networks and relationships fare better within all phases of the hazard cycle from planning to reconstruction” than those who do not have access to these types of networks. In addition, community organisations and individuals within informal community networks can provide an enormous amount of assistance, practical and emotional support to the disaster-affected communities (George, 2013). For example, Zhao (2013) found that after a disaster, informal social networks (community people and disaster victims) helped each other and played a prominent role in search and rescue.

Networks have particular features that differentiate their application in the disaster context. After a disaster, these features need new types of links, for example, collaboration and resource sharing that are specific to disaster response and recovery. Social networks are likely to be a significant basis for collective action in communities that facilitates a flow of information for individuals and the community to attain their goals, which can be leveraged in the case of disasters (Ritchie and Gill, 2007).

In a resilience context, community networks and ties are also beneficial, because they allow individuals to draw on community resources and increase the likelihood that such communities can effectively address their collective concerns (Green and Haines, 2011). In addition, social networks are important because they allow people to resolve collective problems more easily. The most resilient communities are those that work together towards a common goal (Davidson, 2006). Community networks can also provide an external resource. Mayunga (2007) argued that where characteristics of a strong community are missing, members of that community tend to have less capacity to cope with disasters, as they can collect less external resources through their networking relationships.

This study understands *networks* as households’ formal and informal relationships with immediate family members and relatives (bonding networks), neighbours and friends (bridging networks), and organisations, for example, NGOs and local government (linking networks) in the coastal villages of Bangladesh.

1.7 Understanding disaster resilience and recovery

Disaster resilience and recovery are the key terms of this thesis, as it aims to explore the contribution of social capital to resilience and recovery processes. These terms are defined in the papers or findings of Chapters 2, 3, 4 and 5. This section provides a short overview of these concepts.

1.7.1 Disaster recovery

A disaster is a serious disruption of the functions of a community through which widespread human, material, economic and environmental damage and loss has occurred (Asian Disaster Preparedness Centre (ADPC), 2015). Since disaster creates enormous disruption, recovery efforts are essential for bringing the community back to normalcy after a disaster. Disaster recovery is a crucial phase in the disaster management cycle. The term “recovery” is commonly used in the sense of “bringing the post-disaster situation to some level of acceptability [which] may or may not be the same as the pre-impact level” (cf. Chang, 2010, p. 304). The Asian Disaster Preparedness Centre (ADPC) (2015, p. 9) defines recovery as “the restoration and improvement where appropriate – of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors”. Smith and Wenger (2007) defined disaster recovery as the differential process of restoring, rebuilding and reshaping the physical, social, economic and natural environment through preventive planning and post-event actions. Considered holistically, “recovery” is “putting a disaster-stricken community back together” (Mileti, 1999, p. 229). The United Nations International Strategy for Disaster Reduction-UNISDR (2009) defined recovery as the restoration and improvement of facilities, livelihoods and living conditions of disaster-affected communities – including efforts to reduce disaster risk factors. The disaster recovery phase is also important in the process of community resilience. Therefore, long-term planning needs to incorporate a holistic and comprehensive understanding of community relationships or networks and resources during the whole recovery process (Smith and Boruff, 2011). Moreover, the recovery period offers an opportunity to strengthen local organisational capacity to facilitate economic, social and physical development long after the disaster (Berke et al., 1993).

The above discussion raises some crucial issues regarding disaster recovery, for example, community restoration and improvement; preventive planning and action; economic, social and physical development; and holistic efforts. This present study considers disaster recovery as the capacity of households and communities to restore households' livelihoods and the essential community services after a disaster and bounce back to a pre-disaster state. Many stakeholders (e.g. households, local community, NGOs and local and national government) are involved with the recovery process after a disaster. From a household perspective, during recovery from a disaster, Bangladeshi coastal households depend on household members and relatives (bonding social networks), neighbours and friends (bridging social networks) and NGOs (local, national and international), FBOs, other CBOs, Civil Society Organizations (CSOs), and local and national government (linking social networks). The disaster recovery processes include a set of policies, programs and actions implemented by key stakeholders, which enable the community to recover from a disaster.

1.7.2 Disaster resilience

Disaster resilience is one of the new concepts that has recently entered into disaster discourse, but its entrance could be seen as the birth of a new culture of dealing with disasters (Manyena, 2006b). The outcomes of the World Conference on Disaster Reduction (WCDR) 2005 confirmed that the concept had been gradually finding more space in both theory and practice in a wide range of disaster risk reduction (DRR) discussions and related interventions (Manyena, 2006a). Resilience has been previously used in both ecology and physics. In the sphere of ecology, the concept of resilience gained prevalence following Holling's (1973) work on "Resilience and Stability of Ecological Systems" (Klein et al., 2003). Holling (1973) used the term "resilience" for ecosystems as a measure of the ability of these systems to absorb changes. He defined resilience as the ability of a system to return to a state of equilibrium after a temporary disturbance.

The Oxford English Dictionary defines resilience as (a) the act of rebounding or springing back and (b) elasticity (Klein et al., 2003). Basically, resilience is derived from the Latin word "resilio", which means to "jump back" (Klein et al., 2003, p. 35). However, since the 1970s, the concept has also been used in a more metaphorical sense to describe

systems that undergo stress and have the ability to recover and return to their original state (Klein et al., 2003). Resilience is the community's ability to return to its previous state after a disaster (Carpenter, 2013). It is the ability of a community that has been exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner through the preservation and restoration of its essential basic structures and functions (UNISDR, 2009). Resilience is the capacity of a community to adapt and influence the course of environmental, social and economic change. The resilience of social-ecological systems is often described as a combination of three characteristics – the capacity to absorb shock; capability for self-organisation; and the capacity for learning and adaptation (Folke et al., 2002). The International Federation of Red Cross and Red Crescent Societies (IFRC) (2012, p. 7) defined resilience as:

The ability of individuals, communities, organisations, or countries exposed to disasters and crises and underlying vulnerabilities to: anticipate, reduce the impact of, cope with, and recover from the effects of adversity without compromising their long-term prospects.

In addition, many researchers now claim that a successful recovery should not return the community to its pre-disaster condition, but should result in an increase in disaster resilience (Mileti, 1999, Smith and Wenger, 2007). The Asian Disaster Preparedness Centre (ADPC) (2015, p. 9) provides a comprehensive definition of resilience:

Resilience, the ability of a system, community or society exposed to hazards to resist, absorb, accommodate and/or recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Bruneau et al. (2003, p. 5) defined resilience as “the ability of social units (e.g. organisations, communities) to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimise social disruption and mitigate the effects of future earthquakes”. Wallace and Wallace (2008) understood the term “resilience” as the ability of an individual or group to bounce back from a blow.

In this study, because it focuses on responses to disasters, *resilience* refers primarily to the capacity for recovery. This study explores how households use their capacities through social networking relationships (bonding, bridging and linking) to contribute to disaster resilience.

1.8 Methodology

In conducting this study, the researcher was aware of the complexities in the field of disaster and the coastal communities of Bangladesh, as well as the challenges in exploring the contribution of social capital to disaster recovery. This study is more empirical (based on data gathered through intensive fieldwork) than theoretical, and empirical data (directly collected from field) was used to answer the particular research questions. In examining the research questions and understanding the underlying relationships between social capital and disaster recovery, the “social capital framework” was used. Through a mixed methods approach and using both qualitative (interviews, focus groups) and quantitative (surveys) data, conclusions were drawn as to when households’ social networks perform well and poorly, and what the possible options are to develop the capacities of social networks to effectively contribute to disaster resilience and recovery.

The techniques or procedures used in this thesis to collect and analyse data related to the research questions (Crotty, 1998) are described below. This section overlaps slightly with the method sections of subsequent chapters (or papers).

1.8.1 Study approach

A mixed methods approach¹⁰ (using both quantitative and qualitative data from various data sources) was employed to investigate how Bangladeshi coastal households used their bonding, bridging and linking networks in their recovery process after Cyclone Sidr. Mixed methods was an appropriate approach because it enables triangulations on questions via diverse kinds of data (Creswell and Clark, 2007). The mixed methods approach is usually used in social and human sciences when the limitations of quantitative

¹⁰ Through a mixed methods approach a researcher tends to base knowledge claims on pragmatic grounds (e.g. consequence-oriented, and problem-centred). It employs strategies of inquiry that involve collecting data to best understand the research problems. The data collection also involves gathering both quantitative and qualitative information (Creswell, J. W. 2003. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, London, Sage Publications).

and qualitative methods are relevant to the enquiry (Creswell, 2003). In this research, mixed methods approach is used for a more robust investigation of the contribution of social capital to disaster resilience and recovery than does a single method approach. Other reasons for using mixed methods approach are:

- it facilitates data triangulation that increases the robustness of reliability and validity of data. It also helps to develop a complete understanding of a research problem.
- it helps using multiple data such as qualitative data (interviews, focus groups) and quantitative data (surveys). Integration of qualitative and quantitative data maximizes the strengths and minimizes the weaknesses of each type of data (Creswell, 2011).
- qualitative data (e.g. trust, norms, peoples' experiences with cyclones, their needs, and other resources that households used for post-disaster recovery and resilience) was used to develop better descriptions of local social capital perspectives and their contribution to disaster recovery process (Chamlee-Wright and Storr, 2011). Quantitative data was used to identify broad patterns in social life (e.g. damage and loss from cyclones, households' income, expenditure, loans, household heads age and level of education, occupation, etc.) - specifically in matters relevant to recovery processes - in the study villages.

1.8.2 Study area

This study was conducted in South Charduani and Tafalbaria villages of Charduani *Union* (the smallest local government unit), Pathorhgata *Upazila* (sub-district) of Barguna district, between February and July 2013. The villages are situated on the southern coast of Bangladesh, on the banks of the Baleshwar River – a channel of the Bay of Bengal (Fig. 1.1) – where a significant number of households exist close to and/or outside the protection of the embankments. Study villages were selected purposively based on earlier studies which indicated that the coastal villages are susceptible to multiple hazards (Paul and Routray, 2013). The study villages were selected for several reasons:

- (a) They are located within a high cyclone risk zone (Fig. 1.2) and are highly prone to cyclones and storm surges. Six major cyclones – Sidr 2007; Reshmi 2008; Nisha 2008; Bijli 2009; Aila 2009; and Mahasen 2013 – hit this area (and our study villages in particular) in the seven years from 2007 to 2013 (Bangladesh Meteorological Department, 2013). This study focused on Cyclone Sidr.
- (b) Cyclone Sidr severely affected these villages, causing 344 deaths of inhabitants, which was 4% of the total population of the villages; about 90% of houses in these villages were destroyed (Multi Task, 2009, Islam and Walkerden, 2014).
- (c) Consequently, the villagers' responses to Cyclone Sidr revealed aspects of resilience and recovery in extreme circumstances, which we expected to be useful for developing cyclone disaster management policies for the Bangladesh coast. Cyclones and related storm surges have many subsidiary effects in these areas, including flooding, saline intrusion into agricultural land, and erosion (Alam and Rahman, 2014).

1.8.3 Cyclone Sidr

On 15 November 2007, the super Cyclone Sidr roared across the south western coast of Bangladesh with heavy rain and high waves. It affected 30 districts (out of 64), 200 *Upazilas* and 1,950 Unions, causing extensive physical destruction, casualties, damage to crops and livestock and flooding of low-lying land. The cyclone-induced storm surge reached a maximum height of approximately 20 feet in certain areas and winds up to 220 km per hour. Total damage was estimated to be USD 1.6 billion. Sidr was a category 4 with a diameter of nearly 1,000 km and sustained winds up to 240 km per hour. It was the second most destructive cyclone out of 14 that have hit Bangladesh in the last 15 years since 1991. Sidr claimed 3,406 human lives. More than 55,000 were injured, and about 9 million people were affected, while over 1,000 remain missing (Government of Bangladesh, 2008a). This was a big disaster for the poverty-stricken coastal villages of Bangladesh. The characteristics of Cyclone Sidr and the extent of damage and loss of coastal villages make it an appropriate focus for this study. Households of study villages provided a strong test of resilience because they faced a destructive cyclone, and therefore,

this study particularly revealed how households' social networks performed to recover from Cyclone Sidr.

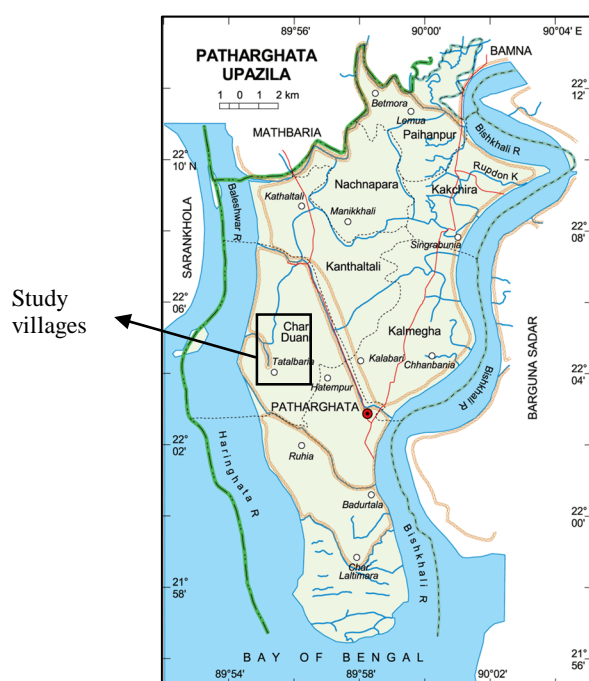


Figure 1.1 Study villages.
Source: Banglapedia, 2006

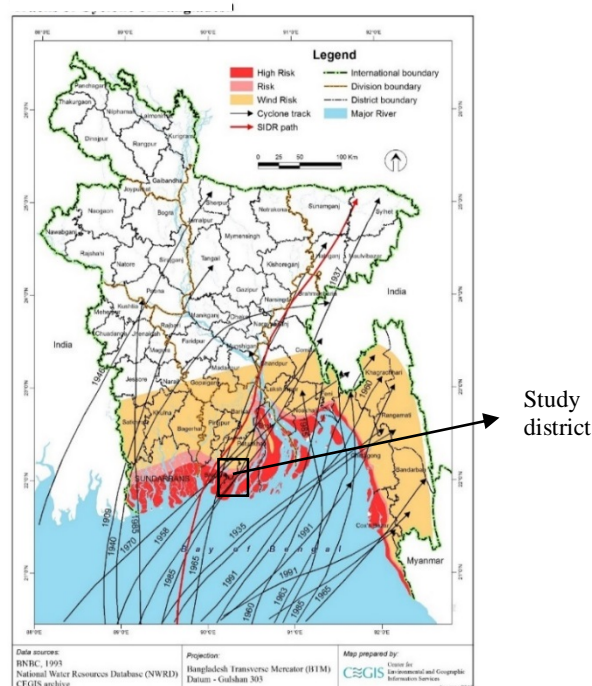


Figure 1.2 Cyclone tracks
Source: CEGIS, 2008

1.8.4 Sampling and recruitment of participants

The study used a combination of random and purposive sampling (Chamlee-Wright and Storr, 2011). The study villages were selected purposively: the researcher identified a disaster-affected coastal district, then an *Upazila*, a Union, and finally, two villages, ensuring that the study villages were typical in the region and had been substantially impacted by Cyclone Sidr. The focus of this study is household experiences, not village life; therefore, taking only two villages is quite reasonable for this study. Moreover, based on two study villages, the findings regarding the contribution of social capitals to disaster resilience and recovery are expected to apply generally along the Bangladesh coast, as the hazards and vulnerabilities of the coastal villages and their socioeconomic characteristics are very similar throughout this region (Alam and Rahman, 2014, Islam and Walkerden, 2015).



Figure 1.3 Path of Cyclone Sidr.
Source: Google image.

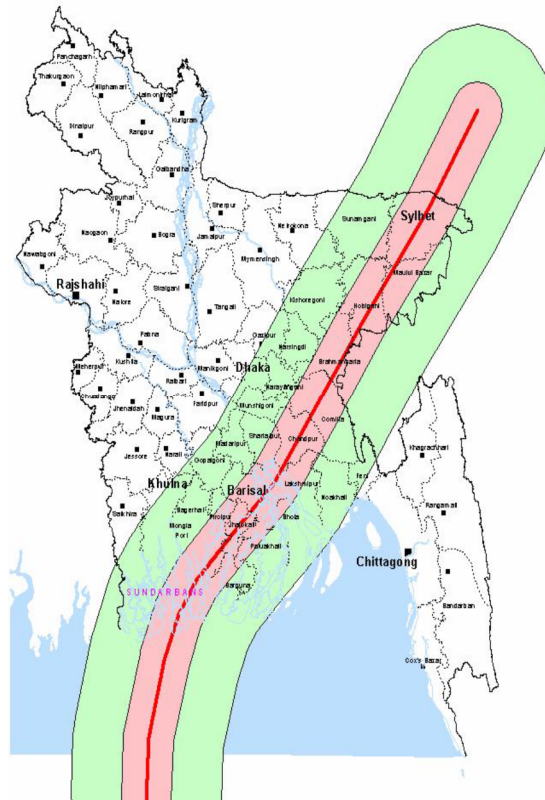


Figure 1.4 Destructive path of Cyclone Sidr.
Source: CEIGS, 2008

One hundred and fifty-nine randomly selected household-heads were interviewed, and valid responses were obtained from 156 (74 from South Charduani, and 82 from Tafalbaria, and 3 incomplete questionnaires during data editing, which were deducted), sufficient for 93% confidence that the percentages observed in our sample are within 7% of those typical of households in the villages (Yamane, 1973). (A 95% confidence interval would have doubled the level of fieldwork required, and 93% confidence was considered to be sufficient to inform policy development, given that the study approach hinges on triangulating multiple lines of evidence (Karim et al., 2012)). The participants in case studies, FGDs, local KIIs, and PMIs were selected purposively, and a snowball sampling technique was followed to identify the participants for DPIs.

Participant recruitment for this study was entirely voluntary and a consent form (see Appendix A) was used. If anyone was not interested in participating, they were not recruited. When the research team (I and two research assistants) returned to a home to work through the questionnaire, household-heads were asked again if they wished to

volunteer, and they were reminded that they can withdraw at any time, without consequence, including without anyone else being told that they have chosen to do so.

Household-head participants received Tk. 800 (AUD 10)¹¹ for the interview session; this approach was similar to that of Hawkins and Maurer (2010). Existing research shows that the coastal people are poor and most of them are involved in agricultural and fishing labour. They usually work on others' agriculture farms and fishing boats as day labourers. Each interview session took approximately two hours; as a result, the participants did not attend work on the day of the interview. It is appropriate that they are paid, as their family members are dependent on their daily income to meet basic human needs. All study protocols (including providing a payment to participants) were approved by the Macquarie University Human Research Ethics Committee.

Table 1.3 Sampling procedures for selecting study area and recruiting research participants

Study area and participants	Sampling procedures and methods
Study district, <i>Upazila</i> (sub-district), Union and villages	Study area is selected purposively based on the geographic location, proneness to multiple hazards and intensity of cyclones, storm surges, salinity and coastal erosion.
Households	Households are selected randomly.
Case studies	Case studies are selected randomly.
Focus groups	Focus groups are selected purposively.
Key Informant Interviews (local level)	Key informant interviews are selected purposively.
Key Informant Interviews (national level)	Disaster practitioners are selected through snowball sampling, and policymakers are selected purposively.
Disaster practitioners	
Policymakers	
NGO workshops	NGOs are selected purposively for the workshop.
Meeting with local government staff	Union Parishad staff (<i>Chowkidar</i> -village watchmen) are selected purposively.
Meeting with local journalists	Local journalists are selected purposively.

Source: Fieldwork 2013.

¹¹ This payment did not create any bias. To avoid probable biasness, household-heads were randomly selected and payment was provided after all interviews in each of the villages were completed. The household-head participants were asked to come to a local NGO office (nearer to the villages) to receive the money. To avoid any local pressure for household-heads to become involved as participants (many more people could have been interested to participate if the payment was known), the payment issue was kept secret.

1.8.5 Data sources and data collection tools

For data triangulation, multiple data sources and data collection techniques were used. Data sources were both primary and secondary. *Primary data* were collected through questionnaire surveys, interviews with local key informants, key informants from the national level (e.g. disaster practitioners and policymakers), and focus groups. NGO workshops, and meetings with local government staff and local journalists were also conducted. *Secondary data* were collected from government and NGO records, previous studies, publications, journal articles, reports and local newspaper articles about the recovery processes in the study villages and overall contribution of social capital to disaster resilience and recovery. The data collection techniques were as follows.

1.8.5.1 Household-head surveys

The researcher and two research assistants (university graduates who are trained social workers and experienced with conducting several fieldworks) were directly involved in conducting face-to-face interviews through a structured survey questionnaire with 43 close-ended and open-ended questions (see detailed survey questionnaire in Appendix B). The questionnaire was pre-tested (10% of total sample) and necessary corrections were made before the final survey was administered. A local NGO assisted during the fieldwork to introduce the researchers to the villagers.

During the interviews with household-heads, the physical settings and the everyday lives of villagers were observed, which contributed to overall understanding. The interviews with households were complemented by a variety of qualitative investigations (along with quantitative questions) to provide additional perspectives on resilience and recovery. Qualitative methods create a lens through which social norms, trust, mutual cooperation, people's emotions, needs, and other culturally and socially embedded resources that are used by households for post-disaster recovery (Islam and Walkerden, 2014, details are also discussed in Chapter 2) can be viewed. Household-heads were interviewed in their homes, and on most occasions, other household members were part of the conversation and contributed additional information. In these villages, the usual practice is for household-heads to be the primary spokesperson on a family's behalf, as

they have a good sense of their household's vulnerability to cyclones (Islam and Walkerden, 2014).

1.8.5.2 Case studies

To minimise any gaps in the data obtained from the interviews interview four case studies were conducted to obtain in-depth information. Case studies were also conducted to understand individuals' experiences in recovering from Cyclone Sidr, where they described the severity of Cyclone Sidr and their socioeconomic challenges to recover from damage and loss. Interesting information about moneylenders and sea-pirates was also obtained. Out of the four case studies involved, two were knowledgeable about pirates as they had experienced abduction. Besides, case studies provided additional information to that received through interviews. Respondents for case studies were chosen purposively from the household-heads (not involved in the surveys) of study villages (Khalil, 2012). A checklist was developed for conducting case studies (Appendix C), where a variety of open-ended questions were asked about the contribution of family members, relatives, neighbours, friends, and NGOs and local government to post-Sidr recovery. They were also asked to comment on NGOs' microcredit, moneylenders' loans, corruption, early warnings, and cyclone shelter centres. They provided additional information about their recovery challenges and future pathways to building a disaster-resilient community. In this technique, verbal queries were made and responses were noted. Two research assistants helped to take notes while discussions were held.

1.8.5.3 Focus Group Discussions

Focus Group Discussions (FGDs) were employed to obtain more in-depth and diverse data for study aims and research questions, and to understand the real and perceived disaster threats and recovery challenges, and how households employ social networks as a capacity to recover from Cyclone Sidr. Eight FGDs with the villagers were conducted through a semi-structured open-ended checklist (see Appendix D). Each focus group consisted of eight to 10 members. Some basic criteria were followed during group formation, for example, homogeneity, different occupational groups (e.g. fishing, farming, housewives and students), age, education, and gender. FGDs were carried out in a room in an NGO office, refreshments were arranged, and a moderator from the community was

selected and briefed about the questions and gave a summary to the participants about the aims of the study. Ten questions were set, and the duration of each discussion was 50–70 minutes for each group. The researcher and two research assistants took notes during each discussion. A classical focus group logic was followed, for example, FGDs continued until no new answers or information was forthcoming.

1.8.5.4 Key Informant Interviews

Thirty-seven Key Informant Interviews (KIIs) took place with key local leaders including local government and NGO officials, Imams, teachers, village leaders, moneylenders, volunteers and so on. A checklist was used to conduct the interviews (see Appendix E). These people are the key individuals in the villages and played a direct and indirect role in the community rebuilding process after Cyclone Sidr. Therefore, their experience was important to include in the thesis as to how bonding, bridging and linking social capital contributed to disaster recovery, and what major challenges they faced. Along with local key informants, national-level disaster practitioners and government policymakers were also included. Combining national, regional and local experience enabled issues at each level to be considered to draw a conclusion on the contribution of social capitals to disaster resilience and recovery on the Bangladesh coast. The categories of local key informants are presented in Table 1.4.

Table 1.4 Key Informant Interviews at the local level

Category	Number
Local government representatives and staff (Union Parishad-UP) (UP Chairman, Members (both male and female and current and ex))	10
Senior citizens	2
Village doctors	2
Moneylenders	2
Imams	2
Teachers (school and madrasa)	4
VDP member (Village Defence Party)	1
Village headmen	2
Club secretary	1
Microcredit group leaders	1
Village shopkeepers	1
Union agriculture workers	1
CPP (Cyclone Preparedness Program) volunteers	1
CPP officials	1
NGO officials	5
Upazila Nirbahi (executive) Officer (UNO)	1
Total	37

Source: Fieldwork 2013.

1.8.5.5 Disaster Practitioner Interviews

As national-level key informants, 14 disaster practitioners were interviewed (national and international NGO officials and freelance researchers – Disaster Practitioner Interviews (DPIs)). They were interviewed to explore the outlooks of national-level disaster experts. The disaster practitioners were well experienced in the disaster and climate change fields, and they had been working in these areas for 10–15 years. Their extensive field-level experience provided additional insights that added value to this study. A semi-structured open-ended checklist (see Appendix F) was used to interview the disaster practitioners. Questions were asked on the strengths and weaknesses of bonding (family members and relatives), bridging (neighbours and friends), and linking (NGOs and local government) networks. They also provided information on corruption, early warnings, community shelter centres, livelihoods, major policy gaps, and finally, the pathways to building a resilient coastal community.

1.8.5.6 Policymaker Interviews

Five policymakers were interviewed (executives of Ministries and departments – Policy Maker Interviews (PMIs)), who were involved with formulating disaster management policies and plans, and designing programs for disaster resilience and climate change adaptation. Policymakers were taken from the Ministry of Disaster Management and Relief, Department of Disaster Management (DDM), and Comprehensive Disaster Management Program (CDMP). A semi-structured checklist (see Appendix G) was used to conduct the interviews. Questions were asked on the contribution of local government (Union Parishad) and the Union Disaster Management Committee (UDMC) to recovery after cyclones. Disaster practitioners provided additional information on post-disaster corruption, social capital, disaster policies, policy gaps, and building a disaster-resilient community.

1.8.5.7 NGO workshop

A day-long NGO workshop, arranged by the Upazila Nirbahi Officer (UNO), the chief executive of a sub-district, was an effective way to obtain stakeholders' views on post-Sidr redevelopment. Twenty-six local NGOs participated in the workshop and shared their

experiences of Cyclone Sidr and ideas on disaster resilience and recovery. Most of them have disaster risk reduction programs and experience working with post-Sidr redevelopment activities. A semi-structured checklist was used (see Appendix H) to explore the issues during the workshop. A discussion was initiated on how local NGOs contributed to post-Sidr redevelopment, what challenges they faced during recovery activities, and what community problems they identified that require further attention to develop. The NGOs also talked about post-disaster corruption, policy issues, local moneylenders, alternative farming, constraints of fishing, and microcredit activities of NGOs. Based on the existing needs and problems of the local community and various stakeholders, finally, they proposed a possible pathway to building a disaster-resilient coastal community.

1.8.5.8 Meeting with local government (Union Parishad) staff

The researcher held a discussion meeting with village police i.e. village watchmen, locally called *Chowkidar/Gram* police. Nine *Chowkidars* – the representatives of the local government unit (Union Parishad) – were present in the discussion meeting. The *Chowkidars* are responsible for disseminating early warning information in the local communities before a cyclone, and work as rescuers after a disaster. The discussion meeting provided important information about the capacity of Union Parishad in disaster recovery, how they worked after Cyclone Sidr, what problems they faced, the existing challenges of Union Parishad and, finally, the possible options to strengthen the capacity of Union Parishad to contribute effectively to disaster resilience and recovery. They also identified a lack of logistical support and low salaries as two of the key causes of their poor performance in disaster recovery activities. A semi-structured checklist was used for the discussions (see Appendix I).

1.8.5.9 Meeting with local journalists

A meeting was conducted with local journalists, also known as local civil society members, who work as local representatives of different national daily newspapers. Twelve journalists were in the meeting. Journalists played a vital role both at the pre-disaster and post-disaster levels through disseminating early warnings, reporting in the

newspapers, and distributing relief goods as volunteers. A semi-structured checklist (see Appendix J) was used for this meeting. Various questions were asked that extracted information about the strong and weak performance of NGOs and Union Parishad after Cyclone Sidr, their observations of post-disaster relief distribution and corruption, and early warnings and peoples' responses. Finally, they were asked for suggestions on how to strengthen the capacity of NGOs and Union Parishad to contribute effectively to disaster recovery, and identified possible options for building disaster-resilient coastal communities.

1.8.6 Study coordination schema

Table 1.5 presents how the research questions were addressed in the study methods through data sets, data sources, and data collection tools, and implies the powerful research design of this study. The table also shows evidence of data triangulation, where multiple data sources and data collection techniques were used.

Table 1.5 Study coordination schema

Study questions	Data sets	Data sources	Data collection methods
When do bonding, bridging & linking networks perform well and poorly in disaster resilience and recovery?	Strengths and weaknesses of bonding and bridging social networks.	Households, focus groups, key informants, journalists, NGOs, local government staff, current literature.	Surveys, interviews, FGDs, case studies, meetings.
How do households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks?	Contribution of households' asset-based capital to bonding and bridging networks.	Households, focus groups, key informants, current literature.	Surveys, local KIIs, FGDs, case studies, NGO workshop.
How are social networks addressed in the disaster management policies of Bangladesh?	Social networks' inclusion in disaster management policies.	Policy documents, disaster practitioners, policymakers, NGOs, current literature.	Policy document analysis, DPIs, PMIs, NGO workshop.
How can social networks' capacities be developed for effectively contributing to disaster resilience and recovery?	Recommendations for strengthening social networks.	Households, focus groups, key informants, journalists, NGOs, local government staff, current literature.	Surveys, FGDs, local KIIs, DPIs, PMIs, meetings, NGO workshop.

Source: Fieldwork 2013. Note: FGDs=Focus Group Discussions, KIIs=Key Informant Interviews, DPIs=Disaster Practitioner Interviews, PMIs=Policymakers Interviews.

1.8.7 Data analysis techniques

The quantitative data were analysed using the Statistical Package for Social Sciences (SPSS), which provided descriptive statistics, for example, frequency distributions, percentages and tables (Paul and Routray, 2013, George, 2008). Notes were taken during interviews, workshops and other group processes. In addition, field observations were used to assist with understanding the physical settings and everyday practices of village life (Pouliotte et al., 2009). During the interview sessions, questions were asked about the effectiveness of social networks' initiatives in rebuilding the community and returning it to "normal" after Cyclone Sidr, and how social networks' capacities could be strengthened to contribute effectively to disaster resilience and recovery. Qualitative data were analysed by coding meeting notes with initial concepts and grouping data to identify key themes, and finally analysing the interview, focus group, and meeting notes related to each theme to draw out key findings (Schutt, 2011, Islam and Walkerden, 2014). Qualitative data was coded according to the broad theme/category relating to research questions. These themes were: the contribution of bonding networks (household members and other relatives), bridging networks (neighbours and friends), and linking networks (NGOs and local government), and weak performance of bonding, bridging and linking networks. Based on these themes collected data were coded/labelled according to the well and poor performance of these networks in disaster recovery. The good support was labelled in different categories such as food, shelter, cash, building material, clothing, physical labour, mutual works, search and rescue, emergency relief, housing, and livelihood. On the other hand, poor support was labelled by limited physical and financial capital, conflict, competition, favouritism, and corruption. Qualitative and quantitative data were considered together, to increase confidence in interpretations and to provide a combination of breadth and depth.

1.8.8 Ethical considerations

All study protocols were approved by Macquarie University Human Research Ethics Committee (reference number 5201200877, see Appendix K) and were designed to minimise risks from disclosure of views about corruption. The researchers only raised questions about possible corruption in private/individual discussions (e.g. household surveys and KIIs). When the topic of corruption was raised in focus groups, some

participants started to point out individuals; the researcher and research assistants intervened and explained that the focus groups were not an appropriate medium for such a conversation. Sources of views on corruption were not identified personally in order to protect identities.

1.9 Thesis argument

The key thesis argument is that households' social networks (e.g. bonding, bridging and linking) contribute to the disaster recovery process in the cyclone-affected coastal villages of Bangladesh. Along with this central argument, other supporting arguments are:

First, bonding social networks (e.g. immediate family members and other relatives) provide crucial support to the affected households after a disaster. Immediate family members continue to support the household until the long-term recovery phase after a disaster. However, limited physical and financial capital, poverty, frequent disasters, and horizontal relationships greatly increase their vulnerability after a disaster and make recovery much more difficult. Relatives (e.g. in-laws' households) usually provide support at the early recovery phase (up to one month after a disaster). After this time, they are often only able to provide support in the form of labour due to their poverty and because they are also affected by the disaster. Despite the limited capacities and existing recovery challenges, these bonding networks never break down due to their tight-knit relationships and strong trust.

Second, bridging social networks (neighbours and friends) exchange support after a disaster through search and rescue, sharing of food, water and shelter, and cooperative works. The exchange of support within the bridging networks sustains in the early recovery phase (up to one month after a disaster). After that, bridging relationships become less active and sometimes break down due to poverty, conflict and competition to access to the external resources (recovery benefits). Thus, the crucial social capital elements such as norms of reciprocity and trust decline. In addition, due to limited households' assets, for example, physical, financial and human capital and uncertainties of natural capital, coastal households cannot provide longer-term recovery support within the bonding and bridging networks. Based on these weaknesses of bonding and bridging

networks, this thesis argues that for longer-term recovery, disaster victims usually need support through linking social networks, for example, NGOs, local government and other community-based organisations.

Third, linking social networks (NGOs and local government) provide strong support after a disaster through emergency relief, shelter and livelihood assistance. However, they do not provide equitable support to the affected households due to their favouritism and corruption. This malpractice creates conflicts and fosters dissatisfaction and disparity among the households in the villages. It also creates mistrust between households, and between households and relief provider organisations, which weakens both the bridging and linking networks.

Fourth, local social capital (bonding, bridging and linking) is not properly articulated in the disaster management policies of Bangladesh. The policy documents give more importance to linking social networks than bonding and bridging social networks. For example, government's links with various organisations and foreign states are given higher priority than the households' links with organisations. Even post-disaster government reports have not acknowledged the contribution of local social capital to the recovery process. Moreover, there is a gap between existing policies and ongoing implementation practices.

Fifth, this thesis argues that effective actions are required for strengthening households' capacities (bonding and bridging networks) through increasing local employment and securing existing livelihoods. Linking networks (NGOs and local government) should increase their emphasis on DRR, providing more robust housing, distributing recovery support equitably, and through strengthening community participation to contribute effectively to disaster resilience and recovery in the coastal villages. This thesis also argues that through community participation (in particular, involving community leaders – for example, Imams, village headmen, and school and madrasa teachers) in the relief distribution process, post-disaster corruption and favouritism can be reduced. These community leaders can play key roles at the local level, and civil society organisations such as Transparency International Bangladesh can play key roles at the national level.

1.10 Thesis contribution

This thesis explores the intersection of two issues – “social capital” and “disaster resilience and recovery”. It explores the contribution of social networks, particularly bonding (households’ relationships with immediate family members and other relatives), bridging (households’ relationships with neighbours and friends), and linking networks (households’ relationships with organisations, for example, NGOs, local government and other CBOs) to disaster resilience and recovery in the coastal villages of Bangladesh after Cyclone Sidr. In examining the contribution of social networks, this study documents the existing practices of social capital elements – norms of reciprocity, values, trust, and networks among the villagers (households) and between the villagers (households) and organisations (NGOs and Union Parishad). By addressing four research questions, this thesis contributes to existing knowledge in several ways.

1.10.1 Value added to existing knowledge and social capital literature

This thesis is a unique contribution to the body of knowledge and fills the gaps in the limited literature in the field of social capital and disaster studies in Bangladesh and in the Indian Sub-continent context (India, Pakistan, Nepal, Sri Lanka and Myanmar, because their socioeconomic conditions and livelihoods are very similar to those in Bangladesh). This thesis explicitly contributes to the wider research community by providing further understanding of the contribution of social capital to disaster resilience and recovery. It also explores how social capital elements such as trust, networks, norms, and reciprocal relationships are practised during an emergency through the flow of support, for example, relief, cash and shelter. The current study also assists the practitioner community by providing evidence-based knowledge about what actually occurs (strengths and weaknesses of social networks) with social capital and disaster recovery in the disaster-affected coastal villages of Bangladesh. This thesis operationalises the nexus between social capital and disaster recovery (through providing evidence of how households’ social networks contribute to disaster resilience and recovery) in the specific socioeconomic and cultural context of Bangladeshi coastal villages, which adds value to the existing body of knowledge. This study also revisits the notion of *bonding and bridging social networks* rather than following the conventional understanding, which is an original contribution to the body of knowledge.

This study explores an explicit link between social capital and other livelihood assets, and helps to generate new knowledge and insights into social networks and disaster resilience and recovery in the context of a particular hazard (cyclone and storm surge), a particular place (Bangladesh coast), and a particular study approach (mixed methods). For practical interest, if future researchers want to carry out any comparative study on social capital and disasters between developing and western countries, this study provides a point of reference. It also assists in understanding how households' assets strengthen or weaken the bonding and bridging social networks to contribute to disaster resilience and recovery, which is also an original contribution to the existing knowledge and adds new information to the social capital and disaster literature.

1.10.2 Contribution to policy

This thesis is an evidence-based policy prescription for disaster management. It provides knowledge and information on how social networks are addressed in the disaster management policies of Bangladesh, and how capacities of social networks (bonding, bridging, and linking) can be developed for contributing effectively to disaster resilience and recovery. This is helpful for the policymakers, development practitioners and other stakeholders (concerned groups and agencies) to develop more robust policies, programs and actions to strengthen the capacities of social networks.

1.10.3 Benefits to the research participants

This thesis may also benefit research participants (especially the coastal villagers). As research participants, coastal villagers provided opinions about their needs, expectations and problems based on previous experience with disasters and social capital practices. Based on their experiences, this thesis is designed to have key policy implications. The researcher is committed to sharing the key findings of this study with Bangladeshi key stakeholders, for example, NGOs (through providing precise findings in the Bengali language), and government policymakers and allied departments (e.g. Department of Disaster Management, and Ministries), and this was a condition of the ethics approval for this thesis. The research participants (the coastal villagers) will benefit if the government develops any policies and actions based on these findings. In addition, several thesis chapters have already been published in international peer-reviewed journals, and study

findings have been presented at various international conferences. The international community (donor agents, scholars and concerned groups) can take initiatives for the betterment of Bangladeshi coastal communities. Thus, the coastal villagers can benefit from the thesis findings.

1.11 Limitations

The limitations of this thesis are in three main areas. *First*, in the case of the surveys, only household-heads were interviewed, meaning there is less detailed information about the experience of women and children of the households because they were not interviewed. However, interviews were conducted with eight female-headed households and two focus groups with female members¹² in the two study villages. These provided additional information about women's experiences in disaster resilience and recovery. *Second*, the overall study approach focused on local social capital and local networking relationships. The relationships between national NGOs and international NGOs, and local government and national government, have not been explored in detail. The main focus was, in fact, the immediate context of Bangladeshi villages after a disaster. However, social capital is not the only framework that can be used to look at disaster resilience and recovery, as there is an economic framework for looking at social life and the disaster recovery process; the current framework does not involve the economic activities of social life. The economic framework is a helpful framework in the area of policy dialogue, as many of the decision makers emphasise economic values and there is also a rich research tradition of focusing on an economic framework. *Third*, the fieldwork was carried out after five years of Cyclone Sidr. The memories of interviewees might fade over time. This study crosschecked the various data sources (e.g. surveys, interviews, focus groups, workshops, and meetings) to overcome this limitation. Field data was also verified through existing literature to strengthen the validity and reliability of data.

¹² A local female NGO worker helped the researcher to make initial contact with the female-headed households and female focus groups to conduct the interviews and discussions.

1.12 Thesis structure

This is a thesis by publication¹³ because the researcher is committed to making these research findings available to the research community, and this approach provides significant research training.

Chapter 1 of this thesis provides a basic introduction, explores the research background and gaps in existing research, and describes the research design and conceptual framework. The later sections (Chapters 7 and 8) provide a discussion (synthesis) and an overarching conclusion that brings the key findings and key policy implications of each of the papers together. In contrast to a conventional thesis, the middle sections of this thesis contain a number of stand-alone papers that are either published, submitted for publication, or prepared for publication. A similar structure is found in the other paper-based theses at Macquarie University, for example, Rice (2014) and Ireland (2013). Unavoidably, there is some overlap between the papers within this thesis, especially in the methods and introduction sections. This thesis comprises five papers which form a coherent body of research that addresses the research questions. Two of the papers have been published; one has been submitted to a journal; and other two is prepared for submission. I, Rabiul Islam, am the lead author of all the papers. The researcher's contribution to each of the papers is outlined at the beginning of the corresponding chapters. Input from other contributors is appropriately acknowledged in the individual papers. For the purpose of this thesis, each paper constitutes a chapter. Responses to all of the specific research questions are spread across the papers located in various chapters of this thesis. Table 1.6 at the end of this chapter summarises the overarching research aim, specific research questions, and where the answers to these questions can be found in this thesis.

Chapter 2 is based on bonding and bridging networks. It investigates how bonding networks (households' relationships with family members and relatives), and bridging networks (households' relationships with neighbours and friends) contribute to recovery from disaster. This chapter reveals how bonding and bridging relationships play a vital role in how a community responds to extreme climate events, including cyclones and

¹³ Along with the traditional thesis, thesis by publication is also a usual practice. It is also Macquarie University's preferred thesis model. See: http://mq.edu.au/policy/docs/hdr_thesis/policy.html.

storm surges. It identifies the strengths and weaknesses of these networks through exploring how long these networks can support each other, and when they need to seek external support to face the longer-term disaster challenges. It provides examples of how social capital elements such as norms of reciprocity, mutual works, social values, and trust are practised (or affected) in the Bangladeshi coastal villages after a cyclone disaster. It also presents a number of recommendations to strengthen the contributions of bonding and bridging networks to disaster resilience and recovery.

Chapter 3 is also linked to the discussion of bonding and bridging networks. It explores how households' assets strengthen or limit their contributions to disaster resilience and recovery through bonding and bridging networks. Households' assets are investigated using a livelihood assets framework (DFID, 1999). This chapter shows that due to lack of physical and financial capital, poor conditions of human capital, and uncertainties in access to natural capital (e.g. fishing in the sea and farming land), local households cannot proactively contribute to disaster resilience and recovery through their bonding and bridging networks. It also determines the possible opportunities to strengthen households' assets to contribute effectively to disaster resilience and recovery through bonding and bridging social networks in the coastal villages of Bangladesh.

Chapter 4 is based on an aspect of linking social networks. This study considers NGOs as an important linking network of coastal households due to their increasing number and growing involvement with local people, as well as their provision of support for the disaster victims (Ikeda, 2009, Khan and Rahman, 2007). This chapter examines when NGOs perform well and poorly in disaster recovery. It explores NGOs' post-disaster recovery support, for example, emergency relief, shelter, and livelihood assistance. However, NGOs favour their microcredit borrowers and often take bribes during distribution of livelihood assistance to households, which affects linking networks. This chapter identifies some possible options to develop NGOs' post-disaster activities for providing fair support to the affected households. It also recommends that NGOs should increase their emphasis on DRR activities, providing more robust housing and fostering alternative livelihood options rather than relief-centric activities, because households have a strong preference for empowerment and resilience rather than being relief-dependent.

Chapter 5 is also based on an aspect of linking social networks. This study considers local government as another important linking network of coastal households. Union Parishad (UP) is the lowest tier of local government, and it is closely linked to the local people, as the UP representatives are elected through their direct votes (Khan and Ara, 2006). This chapter examines when UP has performed well and poorly in disaster resilience and recovery. It describes that UP provides important support, such as relief distribution, livelihood assistance and reconstruction of major community services. However, while providing this support, UP representatives sometimes act corruptly, favouring members of their political group and taking bribes. Such malpractice fosters inequality, discontent and mistrust between local households and UP leaders. This chapter argues that UP should be reformed – with civil society leadership – to improve transparency and equity in disaster relief, through a mix of procedural changes and institutional development measures.

Chapter 6 analyses key disaster management and climate change policies of Bangladesh. It aims to explore how social networks are articulated in these policies. This chapter critically analyses three policies – Bangladesh Climate Change Strategy and Action Plan, the National Plan for Disaster Management, and the Disaster Management Act. The critical review of these policies has been juxtaposed to the findings from disaster practitioner and policymaker interviews, meetings with local journalists and local government officials, and the NGO workshop. This chapter describes that despite the importance of social networks in disaster resilience and recovery, these networks are not given adequate emphasis in the policy documents. Analysis reveals that linking social networks are given more focus in the policies than bonding and bridging networks. Moreover, there is a gap between existing policies and ongoing field-level implementation practices – where grassroots views and needs are typically ignored. This chapter argues that existing disaster management policies should be revised, considering the capacities of social networks and the needs of local people, rather than following a top-down approach.

Chapter 7 provides a discussion on findings before reaching a conclusion. It identifies the forms of support essential for recovery and resilience, and critically analyses them. This chapter outlines how households' social networking relationships (bonding, bridging and linking) contribute to these essential forms of support and also identifies the

weaknesses of these relationships. It discusses how social capital elements (norms, trust and networks) are practised in the recovery trajectories through the intervention of bonding, bridging and linking social networks. This chapter also discusses the contribution of other crucial bridging networks (e.g. community leaders) and linking networks (e.g. FBOs) to disaster recovery. It identifies the limitations within the communities (i.e. within the framework of social capital) that affect and limit the overall performance of social capital in contributing to disaster resilience and recovery. Finally, this chapter concludes with the limitations of this study and suggests further research directions.

Chapter 8 provides a conclusion for this thesis. This chapter collates the key findings that are discussed in the individual chapters to provide the final conclusions. It re-states the research aim and questions and provides an indication that these have been fulfilled. This chapter offers an account of key readings of the established literature in the area of social capital, disaster resilience and recovery to rehash the key concepts and arguments. It begins with an introduction and then presents a summary of the findings, the importance of the findings, and limitations of the current study. Finally, it draws a conclusion with recommendations for further research and policy to strengthen the local social capital through building the capacity of households to contribute effectively to disaster resilience and recovery on the Bangladesh coast. Table 1.6 indicates the research questions and response locations in the thesis.

Table 1.6 Research questions and location of answers

Research question 1: When do social networks (e.g. bonding, bridging, and linking) perform well and poorly in disaster resilience and recovery?
This research question is addressed in three papers in the three different chapters.
Chapter 2
Paper 1: “How bonding and bridging networks contribute to disaster resilience and recovery on the Bangladeshi coast” has been published in the <i>International Journal of Disaster Risk Reduction</i> 10 (2014) 281–291.
Chapter 4
Paper 3: “How do links between households and NGOs promote disaster resilience and recovery? – A case study of linking social networks on the Bangladeshi coast” has been published in <i>Natural Hazards</i> 78 (3), 1707-1727.
Chapter 5
Paper 4: “How local governments support households to recover from cyclones in coastal Bangladesh: an investigation of local social capital”. This paper is submitted to the <i>Natural Hazards</i> .
Research question 2: How do households’ assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks?
This research question is addressed in Chapter 3.
Chapter 3
Paper 2: “How households’ assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks in the Bangladesh coast”. This paper is prepared for submission in the <i>Climate and Development</i> .
Research question 3: How are social networks addressed in the disaster management policies of Bangladesh?
This research question is addressed in Chapter 6.
Chapter 6
Paper 5: “Social networks and paradoxes in government disaster policies: how are social networks articulated in the disaster management policies of Bangladesh?” This paper is prepared for submission to the <i>International Journal of Disaster Risk Reduction</i> .
Research question 4: How can social networks’ capacities be developed to effectively contribute to disaster resilience and recovery?
This research question is addressed in Chapter 8.
Chapter 8
Conclusion: The policy implication section of the conclusion answers this question. The policy implication section of each paper in Chapters 2–6 also addresses this question.

Chapter 2-Paper 1: How bonding and bridging networks contribute to disaster resilience and recovery on the Bangladeshi coast

Publication details

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This chapter reveals bonding and bridging relationships play a vital role in how a community responds to extreme climate events, including cyclones and storm surges. This chapter addresses a part of key research questions for example, when bonding social networks (households' relationships with family members and relatives) and bridging social networks (households' relationships with neighbours and friends) contribute well and poorly to disaster resilience and recovery, and how can the capacities of bonding and bridging networks be strengthened for effectively contribute to disaster resilience and recovery. Addressing these questions, it identifies the strengths and weaknesses of bonding and bridging networks.

The key contribution of this chapter is, it identifies the time-specific performance of bonding and bridging networks in the recovery trajectories. It explores how long bonding and bridging social networks can help each other throughout the recovery process, when the bridging networks decline to support within neighbours and friends, and when they need to seek support through linking social networks for example NGOs and local government to face the longer-term disaster challenges. It provides examples of how social capital elements such as norms of reciprocity, mutual works, social values, and trust are practiced (or affected) in the Bangladeshi coastal villages after a cyclone. Finally, it draws number of recommendations to strengthen the contributions of bonding and bridging networks to disaster resilience and recovery.



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How bonding and bridging networks contribute to disaster resilience and recovery on the Bangladeshi coast



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ABSTRACT

Bonding relationships (with family members and relatives) and bridging relationships (with neighbours and friends) are key elements of social networks. These relationships play a vital role in how a community responds to extreme climate events, including cyclones and storm surges. This study investigates how bonding and bridging relationships contribute to recovery from disaster, using the two coastal villages of Bangladesh affected by Cyclone Sidr as case studies. We investigated these contributions through using household surveys, focus groups, meetings with NGOs and local and national key informants. Results show that after a cyclone, affected communities draw heavily on their bonding and bridging relationships to face the immediate crisis. Support through bonding and bridging networks—sharing food, providing comfort, mutual works, etc.—is very important initially. As the time after the disaster increases, these networks perform less well, because of the limited physical and financial capital. After a period of time, bridging relationships become less active and sometimes break down due to poverty, disaster impact, and competition and conflict over access to external support. Bonding relationships, however, do not break down; rather, they continue contributing to the recovery process by reducing food intake, helping with alternative income, and livelihood options through temporary migration and so on. For longer-term recovery, however, disaster victims usually need support through linking social networks, e.g. from the national and international NGOs, local government, and Community-based Organisations. The study concludes by exploring policy options for strengthening the capacities of bonding and bridging networks for disaster recovery and promoting resilience.

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1. Introduction

Bangladesh is one of the countries most vulnerable to climate change in the world [1–3]. Climate change is increasing the frequency of various extreme climatic events, for example, cyclones and storm surges, on the Bangladeshi coast [4]. Along with the cyclone disaster

there are persisting local hazards (e.g., salinity, river bank erosion etc.) in the coastal parts of Bangladesh [5]. These hazards affect many socio-economic sectors, creating many physical, socioeconomic, and ecological vulnerabilities [6]. Many initiatives have been taken to address these vulnerabilities and build community capacity to recover from disasters, and promote resilience. This study explores how bonding and bridging social networks contribute to recovery from cyclones – the most serious climate hazard in these regions – and the limitations of these networks.

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Bonding networks (relationships with family members and relatives) and bridging networks (relationships with neighbours and friends) are essential elements of social capital. These relationships play a significant role in how a household responds to natural disasters. When a disaster strikes, the first responders are the local residents because disaster response organisations often need a minimum 48–72 h to reach the affected areas—sometimes longer due to communication and access difficulties. Alam and Collins [7] report that institutional relief goods can take four to five days to reach the devastated areas. Households' reliance on bonding and bridging networks during this initial period – and their ongoing contributions of course – make bonding and bridging networks a key point to focus on to understand disaster resilience and recovery in this region. This study uses experiences with Cyclone Sidr (a category 4 cyclone which hit the Bangladesh coast on 15 November 2007), in two affected coastal villages, to reveal how bonding and bridging networks contribute to recovery from cyclones.

Several studies have considered the importance of social networks in times of disaster [e.g., 8–10, 12]. However, there have been relatively few studies that have given a comprehensive overview of how social networks contribute to disaster resilience and recovery (e.g. the following studies of the impacts of the Indian Ocean Tsunami: [13–15]). The literature on social capital and disaster recovery suggests that homogenous, tight-knit communities have an advantage over less-connected communities in promoting community rebound and redevelopment [16–18]. Likewise, Storr and Haeffele-Balch [11] argued that trust-bonding, tight-knit social networks encompassed homogenous groups, and these networks are crucial in post-disaster recovery. Social networks are important from a resilience perspective because they allow individuals to draw on community resources, and increase the likelihood that such communities can effectively address their collective concerns [19]. Similarly, Davidson [20] argued that the most resilient communities are those that work together toward a common goal. Relatedly, Mayunga [9] argued that where characteristics of a strong community are missing, members of that community tend to have less capacity to cope with disasters.

A community with strong 'bonding' and 'bridging' relationships can be expected to work together to gain access to external resources [21,22]. For example, bonding and bridging relationships played a number of roles in response and recovery, following the 1995 Kobe earthquake [22]. During the response phase, communities were involved in the evacuations and relief efforts, both helping family members (bonding relationships) and also surrounding neighbours and friends (bridging relationships). During the recovery phase, community members focused more on the needs of their particular household e.g., repairing their own shelters, and re-establishing their livelihoods [22].

Bonding and bridging networks are also useful for reducing post-disaster trauma e.g., psychological stress, depression, and other psychosocial symptoms [23,24]. Empirical evidence of post-Katrina clearly shows that lack of social networks predicts both depression and symptoms

of posttraumatic stress disorder [23]. As Aldrich [25] puts it, resilience and recovery are functions of the 'power of people'. He suggests further investigation of recovery at both at the individual and community levels to gain a deeper understanding of people's power/capacity in the rebuilding process. Despite the importance of social capital in disaster resilience and recovery, the nature and use of social capital over the entire recovery phases has received little attention from disaster researchers [26].

Few studies have probed the roles of social networks in disaster recovery in Bangladesh. Alam and Collins [7, a study of 1991 Cyclone] and Paul and Routray [27, a post-Sidr study] do discuss households' coping capacity and responses as a cross-cutting issue. Though a number of studies have been carried out in Bangladesh looking at different issues of cyclone disaster, the contribution of social networks to managing disasters is still little researched. Rotberg [28] suggested that further understanding and research is needed on the role of social bonding relationships, and ways of strengthening local networks, in adaptation to, and long-term recovery from, disasters. This study addresses this gap.

We investigated how coastal households utilised their bonding and bridging networks to survive and rebuild after Cyclone Sidr. This study aims to increase the understanding of researchers, development practitioners, and policy makers about the capacity of bonding and bridging networks, and how they promote the resilience and recovery of cyclone-affected households. This empirical evidence makes an important contribution to the literature of social capital and disaster.

2. Understanding the key concepts

2.1. Social capital

Bourdieu, Coleman, and Putnam's work on social capital underpins this study. Bourdieu [29] has emphasised social ties and how they function to reproduce status. Coleman [30] focused on obligations, sharing of information, norms, and social networks as expressions of social capital. Putnam [31, p. 67] frames social capital as 'features of social organisation such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit'. Putnam's definition differentiates three elements of social capital—norms, social values/trust, and networks [32]. Taking Coleman's and Putnam's positions together O'Brien and Fathaigh [33] define social capital as the ways families and communities foster (or fail to foster) such features of social life as trust, shared information, and positive norms of behaviour, in their networks, for everyone's mutual benefit.

2.2. Bonding and bridging networks

Social networks are a crucial embodiment of social capital. Networks can be described at many resolutions. This study takes households as the primary unit of analysis, because in Bangladeshi villages, relationships amongst household members are very tight, and in many

aspects of disaster recovery, households act as a unit led by the household head [34]. How households support themselves, how households relate to other households, and how households relate to other kinds of organisation (e.g. NGOs and local government), are all important to explore in an investigation of disaster resilience and recovery.

Social networks are commonly differentiated into networks of three kinds, based on the types of relationships people have with each other—bonding, bridging, and linking [21]. Bonding relationships are, broadly speaking, ‘inward looking’ [35, citing Putnam]: they are particularly close relationships. Bridging relationships are outward looking, ‘horizontal’ relationships – relationships with similar entities. Linking relationships are ‘vertical’ relationships – with organisations that have influence over their circumstances [36].

Commonly ‘bonding’ relationships are defined to include relationships with family members, with close friends and with neighbours [37]. However, because this study is focusing on social relationships at a particularly fine resolution – within villages – (a resolution that it is crucial to address to understand disaster resilience and recovery in coastal Bangladesh), and our unit of analysis is households, here we define *bonding* networks as a households’ relationships with immediate family members and relatives (the in-laws of household heads, and their sons and daughters), and *bridging* networks as the households’ relationships with neighbours and friends. There are significant differences in the support that immediate family members provide, and the support that relatives and neighbours and friends provide; from a household perspective, this is a contrast between inward looking and horizontal relationships.

To understand disaster resilience and recovery in these coastal villages, it is useful to separate related households into three groups:

1. Immediate households: people who are functionally members of the affected household (this includes all people dwelling in the affected home but also unmarried sons or daughters who are living elsewhere to provide remittances to support their immediate family);
2. In-law households: the parents of the husband and wife of the affected household, and households formed when a son or daughter marries;
3. Other relatives, e.g. households of the married brothers or sisters of the household head.

In our terms, households in the first two groups—which we term *immediate households* and *in-law households* are in *bonding* relationships with each other: their ties are very close. Family obligations in the third kind of relationship are less intense, because married brothers and sisters have their own households to care for. Households in the third group provide significant support for disaster recovery when they are living in the same village. Because these are better considered as horizontal relationships, rather than inward looking, we discuss relationships of this third kind as part of the discussion of *bridging* relationships—

relationships with *neighbours and close friends*. ‘Neighbours’ are those who live close by, and ‘friends’ are those with whom a household has close emotional ties who are available to help during an emergency. These groups make different contributions to a households’ resilience and recovery, as we show below. Consequently it is helpful to use a households’ perspective on intimacy and commitment – on social capital – when applying these terms in this study.

2.3. Disaster resilience and recovery

Disaster recovery is an important phase in the emergency management process and community resilience. One of the most common desires after a disaster is to ‘return to normalcy’ and ‘rebuild’ through reconstruction, restoration, and rehabilitation [38]. Smith and Wenger [39, p. 237] defined disaster recovery as ‘the differential process of restoring, rebuilding, and reshaping the physical, social, economic, and natural environment through pre-event planning and post-event actions’. The United Nations International Strategy for Disaster Reduction-UNISDR [40] defines recovery as the restoration and improvement of facilities, livelihoods, and living conditions of disaster-affected communities. Aldrich [41, p. 5] understood community recovery as ‘the process of repopulation by survivors – who may have fled or been evacuated – and new residents along with the gradual resumption of normal daily routines for those occupants’. Recovery is the response and activities of various actors (e.g., government agencies, NGOs, business communities, and disaster victims) to deal with disaster impacts [42].

Success or failure of a community’s response to disasters depends to a large extent on individuals’ and households’ capability to cope with adverse situations [43]. The term resilience is used to describe *capacity* to recover—and more generally the ability of a community that is exposed to hazards to resist, absorb, adapt to, and recover from the effects of a hazard [40, cf., 44–47]. The Department for International Development-DFID [48] defines disaster resilience as the ability of communities and households to manage change, through maintaining or transforming living standards in the face of shocks or stresses. In this study, because it is focused on responses to disasters, ‘resilience’ refers primarily to the capacity for recovery.

3. Study area and methods

The study was conducted in South Charduan and Tatalbaria villages of Charduan Union (the smallest rural administrative and local government unit) Patharghata Upazila (sub-district) of Barguna district during February and July 2013. The villages are situated on the southern coast of Bangladesh, on the banks of the Baleswar River, a channel of the Bay of Bengal (Fig. 1). This area is frequently and severely affected by various common disasters like cyclone, storm surge, coastal floods and erosion, and salinity intrusion [49]. The study area was one of the four worst Sidr-affected districts, [50] and it has a high cyclone risk: the majority of previous cyclone tracks crossed this

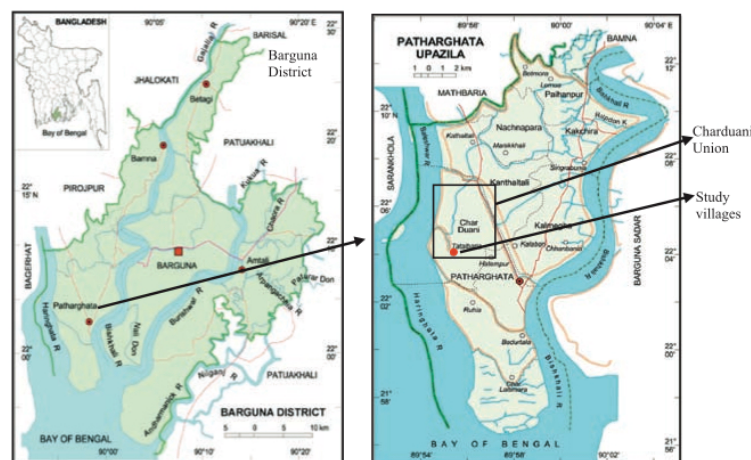


Fig. 1. Location map of the study area.
Source: Banglapedia, 2006.

district, and six major cyclones hit this area (and our study villages in particular) in the seven years from 2007 to 2013.¹ The particular villages were chosen because they were two of the most severely affected by Cyclone Sidr: Cyclone Sidr caused 344 deaths, which was 4% of the total population of the villages, and about 90% of houses were damaged [52]. The impacts of Sidr make these two villages excellent choices with which to explore the experience of severely affected communities, and this in turn makes them a good choice to inform development of robust cyclone disaster management policy for the Bangladeshi coast.

Households are the primary units of analysis in this study, because households are tightly knit in coastal Bangladesh, and act together in disaster recovery [34]. To understand households' experience we randomly selected households, and interviewed their household heads², asking both qualitative and quantitative questions. Because we interviewed them in their homes, on most occasions other household members were part of the conversation and contributed additional insights. In these communities, usual practise is for household heads to be the primary spokesperson on a family's behalf, as they have a good sense of household's vulnerability to cyclones [7]. This has obvious limitations (e.g. in the insight it offers into women's experience), however it is an appropriate, pragmatic method to investigate more general characteristics

of households' recovery, and commonly used in research in these regions [27,54,55]. The number of households interviewed was a trade-off between precision and effort. Our target was 155 households overall—sufficient to give a precision of plus or minus 7%, with 93% confidence [56], given that there were 1990 households in the two study villages; our approach was similar to that of [27,57]. We set targets for each village based on the number of households in each, and within each village selected households randomly. We interviewed 159 household heads, using a structured questionnaire, and obtained valid responses from 156 (74 from South Charduan, and 82 from Tafalbaria). When we interviewed household heads, we also observed the physical settings and the everyday lives of villagers, and that contributed to our understanding.

The interviews with households were complimented by a variety of qualitative investigations, to provide additional perspectives on, and more detail about, resilience and recovery. Qualitative methods are particularly helpful in identifying local perspectives on disaster resilience and recovery. They create a lens through which we can look at social norms, trust, mutual cooperation, people's emotions, needs, and other culturally and socially embedded resources that are used by households for post-disaster recovery [17].

To extend the investigation of village experience, four in-depth case studies were conducted to understand the individuals' experiences in recovering from the damage and loss. In addition, eight Focus Group Discussions (FGDs) with villagers were conducted to further explore how villagers perceived impacts and threats of cyclones, the socioeconomic challenges of recovery from Sidr, and how they used social networks in recovery. The perspectives of local leaders were canvassed through thirty-seven Key Informant Interviews (KIIs) and through meetings with local journalists, local government officials, and a day-long NGO workshop. The perspectives of disaster experts at the national level were explored through interviews with five policy makers (senior government employees—Policy

¹ The six consecutive cyclones e.g., Sidr 15 November 2007, Rashmi 26 October 2008, Bijli 19 April 2009, Nisha 28 November 2008, Aila 25 May 2009 and Mahasen 16 May 2013 hit the study area, and caused a lot of damage and loss [51] Bangladesh Meteorological Department-BMD, *Named Cyclone over Bay of Bengal during 2005–till date*. 2013, Ministry of Defence, Government of the People's Republic of Bangladesh: Dhaka.

² A household is a group of people living together as a family and sharing the same kitchen. The household head is defined as the person making major economic, social and household decisions who represented his/her family members as the respondent for this survey [53] Paul B.K., *Coping with the 1996 tornado in Tangail, Bangladesh: an analysis of field data*. The Professional Geographer, 1998. 50(3): pp. 287–301.

Maker Interviews (PMIs)), and with 14 Disaster Practitioners (national and international NGO employees—Disaster Practitioner Interviews (DPIs)). Combining qualitative and quantitative analysis provides both insight into personal experience, and a capacity to generalise about the villages. Combining villagers', local leaders' and experts' views provides a corrective on the perspectives of each group (i.e. it supports triangulation on key features of village experience) [58]. Combining national, regional and local experience enables issues at each scale to be considered in relation to other scales.

The quantitative data were analysed with SPSS (Statistical Package for Social Sciences), and descriptive statistics—frequency distributions, percentages, tables, and graphs. Qualitative data were analysed by coding meeting notes with initial concepts, and categorising data by key themes, and finally analysing the interview, focus groups, and meeting notes related to each theme to draw out key findings [59].

4. Results and discussion

4.1. Socioeconomic and demographic status of the households

The study villages are relatively poor and vulnerable. There is a significant gap between average annual household income and expenditure, and households do not have any savings (Table 1). Most households rely on loans from multiple sources (Table 1). Majority of them are involved in fishing-related work (67%), and less in farming (17%). Due to saline water intrusion, most farming land is only able to be cropped once per year (*aksona* land). Most of the dwelling houses (96%, both semi-*pucca* and *kutchra*) are not cyclone resilient (Table 1). The household size (5) in the study areas is higher than the national average (4.53). This implies that population growth rate is higher in the coastal areas compared to other rural areas of Bangladesh [60]. The average number of healthy adults in the households is three, however on average only two are working (Table 1).

Coastal households have limited land, and non-land assets, and limited household goods. They have loans against some of them—for boats and nets through moneylenders (*dadondars*), and solar power through NGOs.

4.2. Contribution of bonding networks: Immediate household

Disaster recovery support amongst immediate family members is very important. Beggs, Haines [61] claimed that assistance in recovery is largely provided by family members. Table 2 shows that family members provided crucial support during recovery from cyclone Sidr. All household members received emotional support from other members (Table 2). Households reported that emotional support helped them cope with disaster-induced stress. This study also found that changes in food consumption helped in recovery (Table 2). Due to the shortage of food stock, and the uncertainty of the length of the crisis, family members change eating patterns and reduce

Table 1

Socioeconomic and demographic status.
Source: Household survey 2013.

Status	Key findings
Socioeconomic and financial	Households' primary occupation: fishing 67%, agriculture 17%. Average household annual income: Tk.82576 (US\$1072) ^a . Average household annual expenditure: Tk.86278 (US\$1120). Savings: none. Loan sources: NGOs, banks, moneylenders, local shops, and relatives. Number of loan sources used: One loan 21%, Two 25%, Three 22%, Four 19%, Five 5%.
Demographic and physical	Housing quality: semi- <i>pucca</i> 78% (floor: mud, brick and cement; Walls: bamboo mats, timber, CGI sheet; and roof: CGI sheet); <i>Kutchra</i> 18% (floor: mud; walls: bamboo, jute stick, straw; and roof: paddy/wheat straw). Average household size: 5. Average working family members: 2, and average dependent family members: 2, average healthy adults: 3. Household heads' education: Illiterate 38%, primary School 42%. Household heads' average age: 42 years.
Household assets and goods	Average land ownership: 0.35 acre; no land household: 23%. Non-land assets: livestock, poultry, fishpond, furniture, electronic goods, gold ornaments, boats with or without engine, mobile phone, and solar power.

^a US\$ 1 = BDT 77 as of April 2013.

Table 2

Post-Sidr support of household members.
Source: Household survey 2013. Multiple response.

Support	Percent
Emotional	100
Repairing shelter	37
Food	26
Labour at home	53
Selling labour in markets	69
Cash/remittance	29
Selling household assets and goods	8
Reducing food intake	51
Providing relief information	26

food intake. Household heads, focus groups, and local key informants each said that during the first stages of the crisis, family members usually ate food twice a day (sometimes only once a day) rather than three times. They shift to eating dry food like *muri/chira* (puffed rice) and *gur* (juice from boiled sugarcane or dates), and community foods like *khichuri* (mixed rice with pulse) through linking networks e.g. *longorkhana*³.

³ A *longorkhana* is a temporary camp with free food and shelter for destitute people, including those affected by a disaster. These camps are run with the help of volunteer organisations and personal donations from political leaders and philanthropists.

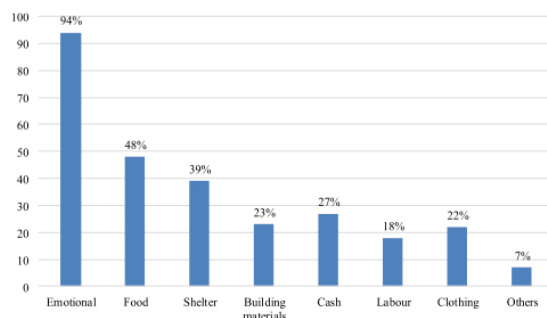


Fig. 2. Support from in-laws households.
Source: Household survey 2013. Multiple response.

Sale of family assets supports only a relatively small percentage of households (Table 2). This reflects the limited physical, and financial capital of coastal people. Survey data also shows that few affected households were receiving regular cash/remittance support from immediate family members in other locations. However, family members provided labour at home (to revive livelihoods, and recover damage and loss) and sold labour (as day labourer/*Rikshaw*⁴ puller) in the markets through short-term migration to support family income.

For households headed by women (8 households, i.e. 5% of those surveyed), the opportunities for support via bonding networks are more restricted. In rural Bangladesh, typically men are the main income earner and are the heads of households, and women's work is inside the home. In our study villages, women became the main income earners, and therefore household heads, when the male head was ill, injured or physically disabled (e.g. due to disasters), when their husband married a second time and lived in a separate household, or their husbands died (Household survey, 2013). It is more difficult for them to re-establish their livelihoods because of their dependence on household-based economic activities e.g., food processing, rearing the livestock, and poultry [62]. There are limited work opportunities available for women outside the home in the rural areas. Just two stand out: catching juvenile black tiger shrimp, known locally as *Bagda pona*, is one opportunity; the second is that local government (Union Parishad) run 'cash/food for work projects' repairing local roads, preferentially employing women (FGDs, 2013). Women are also disadvantaged in competition for community relief goods provided in public places, because cultural norms limit their ability to advocate for themselves in public places [63]. They are, however, able to access microcredit from NGOs to support their recovery.

Household heads say that they prefer independence (Household survey, 2013). The way they use their limited resources – providing emotional support, reducing food intake, and making as much use of their labour capacity as they can – demonstrates vividly their desire to solve their

own problems. What limits, what they do is their lack of assets and income (Table 1). Options for earning an income are limited – fishing and farming are the main opportunities – and both are relatively insecure. Farming income is unstable because of saline water intrusion: farmers cannot cultivate farming land the whole year round, they can grow only one crop per annum (locally called *aksona land*) (Household survey, 2013). Fishing is insecure because of piracy, illegal fishing during spawning (which undermines productivity), and exploitation by moneylenders (*dadondars*). [Moneylenders provide loans for nets and boats, but in return fishers are contracted to sell their catches to the moneylenders, who pay 10–20% below the market rate (FGDs, 2013).]

Because of these constraints, family members are only able to make a very partial contribution to their households' recovery, so seeking help from other networks is essential. However, both local and national key informants indicated that external support through NGOs, and local government sometimes leads households to become relief dependent, a conclusion is also reached by other researchers [27,64]. If we take these findings together – households' substantial efforts to solve their own problems, their limited assets and income, and the risks of relief dependence – it is obvious that better income support – i.e. assistance with employment – would make a substantial contribution to recovery. This is a conclusion supported by local people, disaster practitioners, and policy makers.

4.3. Contribution of bonding networks: in-law households

The kinship network in Bangladesh is strong, as it tends to offer support to relatives in crises [7,65]. More than 50% of Sidr-affected households received cooperation from the households of in-laws (both parents' and children's). Fig. 2 shows among the kinds of support provided by these relatives, emotional care was the most common. Each of household heads, focus group discussions, and disaster practitioners identified that in-laws spending time with, and talking with, affected household members helped to reduce fear and anxiety, encourage them in their recovery efforts.

In-laws' households provided many other kinds of support. Affected households were supported by in-laws providing food, shelter, building materials (e.g., bamboo,

⁴ A *rikshaw* is a three-wheeled passenger cart—the most popular mode of transport in the city areas of Bangladesh. This is one of the prime sources of income for poorer urban people.

CGI sheet, etc.), cash, labour, and clothing. To provide cash support, in-law households often raised loans from NGOs, and gave the sums loaned to their affected relatives. For example, one household head said, “My father-in-law (who is also poor but less affected by Sidr) got a loan from an NGO, and gave me Tk. 8,000 (US\$104). By adding my own Tk.10000 (US\$130) I made the present house”.

What limits in-laws capacity to help is the limited extent of their assets and income, and the fact that sometimes they themselves are affected by the disaster (a point made by each of household heads, focus groups, local and national key informants).

4.4. Contribution of bridging networks: neighbours and friends

Support through neighbours and friends is very crucial in recovery. Beaudoin [66] found that kin, and friends provided one another with numerous forms of support after hurricane Katrina. Beggs, Haines [61] see community ties as ‘informal insurance’ that allows victims to receive support through financial, physical, and logistic. In Bangladesh, a recent example of community support was seen in the Rana Plaza collapse, where local untrained people helped the trained rescue team, rescuing the injured, and retrieving dead bodies.⁵

This study found 60% of households exchanged mutual support with neighbours and friends. Table 3 shows that the main forms of mutual support were search and rescue, sharing of food, and cooperative works (e.g., repairing damaged house, debris cleaning, and cleaning the broken trees from roads, and damaged houses).

Sharing food is a common phenomenon in rural Bangladesh, and it is culturally driven. A Bangladeshi rural housewife always saves a handful of rice (*musti-chal*) in a certain pot to help with facing future crises. One disaster practitioner stated that while making these savings, the housewife does not think only about her family, but also about neighbours and friends. This tradition is widespread in rural Bangladesh.

Neighbours and friends also provided emotional and spiritual support (e.g. comforting victims, *milad*-special prayer by imam). Most houses in coastal villages are not cyclone resilient, so few households could provide shelter to others. Usually people relied on community shelter centres. Similarly, due to their financial vulnerability, affected households were unable to support neighbours and friends with cash (Table 3). Some household heads explained that due to the massive damage and loss that they experienced, they could not provide as much support to their neighbours as they received.

We have some uncertainties about what the households told us about how much they helped their neighbours. We think they may have understated the help they provided, in order to appear more vulnerable. This is a

Table 3

Mutual support amongst households, and neighbours and friends.
Source: Household survey 2013. Multiple response.

Types of support	Received support %	Provided support %
Search and rescue	52	43
Shelter	40	7
Food	39	22
Cooperative works	29	20
Loan with interest	10	0
Loan without interest	13	0
Cash	0	0

possible explanation of the fact that 13% of households reported that they had received interest free loans from neighbours and friends, but no households indicated that they had provided such loans, for example (Table 3). Another possible explanation of this is that only rich households (not represented in our survey data) provided these loans. (The neighbours who provided loans with interest were acting as moneylenders, so for them this is a business relationship, not post-disaster mutuality.)

Focus groups, local key informants, NGO workshop, and local journalists advised that households sometimes present themselves as disadvantaged to external people, and organisations, hoping that in the future, they individually, or as a whole community, will get further access to recovery support. A disaster practitioner stated, for example, seeing the outsiders, disaster-affected people usually think that they came to give them relief. This is a common and negative behaviour”.

5. Importance of bonding and bridging networks in the recovery phases

In these coastal villages, the early/short-term recovery phase (response and relief) lasts for up to a month, and the long-term recovery phase (reconstruction and rehabilitation) lasts from a month to several years. Baird [68] distinguished between short-term and long-term recovery this way: the short-term recovery phase includes search and rescue, providing food and temporary shelter, medical assistance, restoring interrupted essential services, re-establishing communication routes, etc. The long-term recovery phase includes livelihood support, redevelopment of damaged areas, reconstruction of houses, loans and legal assistance, community planning, etc. Bonding and bridging networks make different contributions in these different phases of recovery (Table 4).

Immediate household members support each other through all phases of recovery. As discussed above, their limited income and assets (housing, savings, investment etc.) constrain what they do at all points. Poverty greatly increases their vulnerability in the early recovery phase, and makes long-term recovery much more difficult. In-law households usually support affected households for up to a month (even if they are affected themselves). After that, they are only able to provide their labour, because of their

⁵ Rana Plaza, an eight-story commercial building, collapsed in Savar, a sub-district of greater Dhaka, on 24 April 2013. The search for the dead ended on 13 May with a death toll of 1129. Approximately 2515 injured, were rescued from the building alive [67] Burke, J., *Bangladesh factory collapse leaves trail of shattered lives*, in *The Guardian*. 2013.

Table 4
Role of bonding and bridging networks at the different phases of recovery.
Source: FGDs, KIIs, DPls 2013.

Networks	Time and support		Comments	
	Immediately before event/ evacuation phase	Early recovery phase		
		Up to a week after event		After a month to several years
Bonding	Immediate household members Relatives (in-laws)	Evacuation, share shelter and warning information Share warning information Emotional, labour, cash, asset, change of eating patterns and reduce intake Emotional, food, clothes	Occupation change, selling labour, remittance Cash, building materials, labour	Family members continue to support household—perform less well, because of limited physical and financial capital Cannot support strongly due to poverty, and disaster impact
Bridging	Neighbours and friends	Evacuation, share warning information and shelter	Search and rescue, sharing food and shelter Mutual works, information share, loans	With the increase of time & in-kind support, bridging network decreases, breaks down, becomes weak due to competition and conflict for access to recovery support

own poverty (and, if they are also affected, their own recovery challenges). However, these bonding networks do not break down. In these relationships, relatives continue to support each other. The contributions of these tight-knit relationships between households, family members, and relatives were confirmed by focus groups, local key informants, and disaster practitioners.

Neighbours and friends provide most of their support for each other in the early recovery phase. Their capacity to help with long term recovery is limited by their poverty and their own experience of the disaster. Mutual support is also reduced significantly by competition for access to relief, and conflict that emerges from this. Solidarity in local communities suffers substantially from this. For example, a household head reported, “I clashed with a neighbour during collecting relief goods – who received much more relief than me. However, he didn't sacrifice for me; rather he competed, though he wasn't needy as me – we (including my infant grand-daughter) were almost starved”. Local journalists said that since provision of supports for long term recovery is neither fair nor fully democratic, and support provided is usually less than a community needs, conflict during the long-term recovery phase is usual. Focus group discussions, and local and national key informants also confirmed this pattern.

In the long-term recovery phase, cash and in-kind support (crop seeds, nets and boats, livestock, poultry, new buildings and building materials, rice, household utensils, etc.) increases (DPls, 2013). These are not distributed fairly, as support organizations favour those with whom they have closer relationships (e.g. NGOs favour their borrowers, and local government members of their political parties). Sometimes bribery also occurs during distribution of livestock, nets and boats (FGDs, 2013). Due to the uneven distribution, there is competition and conflict over access to recovery support within bridging networks. Conflict amongst neighbours during the early recovery phase is rare, by contrast. As one focus group put it, ‘we have the competition to attain external supports, and sometimes, use our political, relatives, and friendship links; if any conflict occurs, it soon dissipates; it is not sustained for a long time’. Most households are dependent on linking social networks (e.g., local government, NGOs, and community-based organizations) for long-term recovery.

6. Policy implications and conclusions

From this analysis we can develop a variety of recommendations to strengthen the contributions of bonding and bridging networks to disaster resilience and recovery. They are relevant both to local NGOs and local government who have key direct roles, and to central government, and national and foreign NGOs, who support local actors through formulating policies, providing funding and technical support, and designing new programs.

To leverage households' preference for independence, and to reduce relief dependence in the long term recovery phase, and to help in-law households to help each other:

1. Provide support for construction of strong housing, as this is essential for local resilience, because most of the coastal houses are semi-pucca and kutcha—not cyclone and sea-surge resilient (Table 1).
2. Improve the self-sufficiency of households by such measures as:
 - supporting the multiple use of farming land through alternative crops (rather than just rice, e.g., sunflower, watermelon, potato etc.), and adopting saline resilient crop varieties; government and NGOs can provide cash, seeds, and technical support to support alternative farming practices.
 - strengthening the 'akti bari akti khamar' (one house one farm) central government programme, which promotes every household producing vegetables, cultivating fish, and rearing poultry, duck, and livestock;
 - providing interest free loans to fishers for fishing nets and boats after disasters, to remove fishers' dependence on unfair lending practices of moneylenders during recovery; (the central government, and national and foreign NGOs could each contribute to this).
3. Increase local employment, to improve households' resilience. As discussed above (Section 4.1), on average households have one person unemployed, so expanding local employment can make a considerable contribution to community resilience. Some of the opportunities are:
 - Establishing fish processing factories and ship-yards, identified as opportunities by local people.
 - Tailoring, sewing work, poultry rearing, and cottage industries for women.

Government, and national and international NGOs can help through interest free loans/donation for small projects to build small businesses.

To reduce competition and conflict between neighbours and friends over access to support during the long term recovery phase (Table 4):

1. Markedly improve transparency of distribution of recovery support, notably by providing better information to all villagers on the support that is available and being provided.
2. Greatly increase community participation in planning and management of support for long term recovery.

This paper has examined the contribution of bonding and bridging social networks to recovery from cyclone disaster and promoting community resilience on the Bangladesh coast. The purpose of the current study was to reveal how households' relationships with family members and relatives, and with neighbours and friends, contribute to disaster recovery.

The study reveals that immediately after a disaster, cyclone-affected households depend greatly on bonding (family members, relatives) and bridging (neighbours and friends) networks to cope with the crisis. The kinds of

support these networks provide include emotional care, sharing of food and shelter, labour to help with repairs, and other cooperative works.

As the time after the disaster increases, these networks perform less well, because of the limited physical, and financial capital accessible through these networks. After a period of time, bridging relationships become less active and sometimes break down due to competition and conflict over access to external recovery support, as these are distributed unfairly and unevenly, and there is less community participation in the distribution process. Bonding relationships, however, do not break down. They continue contributing to the recovery process. For longer term recovery, disaster victims usually need support through linking social networks, notably from local government, national and foreign NGOs, and community-based organisations.

The empirical findings of this study contribute to existing knowledge and add value to a growing body of literature on the contribution of bonding and bridging social networks to disaster resilience and recovery by:

1. Examining how these networks work at a fine resolution in village life, differentiating the contributions of immediate household members, in-law households, and neighbours and friends (all of which are generally lumped together as bonding and bridging networks in analyses of social capital in disaster resilience and recovery).
2. Identifying how the contributions of these networks change as the early recovery phase (response and relief) transitions into the long-term recovery phase (reconstruction and rehabilitation).

This study provides a base for further investigation of how bonding and bridging social networks play a part in coping with disasters and strengthening resilience.

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Chapter 3-Paper 2: How households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks in the Bangladesh coast

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This chapter addresses one of the key research questions for example how do households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks? The current chapter identifies the strengths and limitations of household assets and, explores the opportunities to strengthen households' assets to contribute effectively to disaster resilience and recovery through bonding and bridging social networks.

This chapter investigates households' assets using a livelihood assets framework. Contribution of this chapter is that it explores how households' assets strengthen or limit their contributions to disaster resilience and recovery through bonding and bridging networks. It finds that due to lack of physical, financial, and human capital local households do not substantially exchange their support within bonding and bridging networks. This chapter also finds the uncertainties of natural capital for example fishing and farming difficulties, which also affect disaster resilience and recovery activities.

Abstract

Social networks are an important element of disaster resilience and recovery. To address disaster vulnerabilities, Bangladeshi coastal households generally use their social networking relationships; for example, bonding (households' relationships with immediate family members and relatives), bridging (households' relationships with neighbours and friends) and linking (households' relationships with organisations, e.g. local government, NGOs and other community-based organisations). Previous studies have explored the roles and importance of social capital in disaster resilience and recovery, however, few have discussed how households' assets (e.g. the social, physical, financial, human and natural) strengthen and weakens their contributions to disaster resilience and recovery. This paper explores how households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks. To achieve this aim, the study describes the current status of household assets; identifies the strengths and weaknesses of household assets; and finally identifies possible options to strengthen these assets to contribute effectively to disaster resilience and recovery through bonding and bridging social networks. Household assets are investigated following the discussion of *livelihood asset framework*. The current status of household assets and their contribution to disaster resilience and recovery is examined through household surveys, focus groups, NGO workshops, and local and national key informant interviews. The findings show that due to lack of physical and financial capital, poor conditions of human capital, and uncertainties in access to natural capital limits the capacity of local households to contribute to disaster resilience and recovery through their bonding and bridging networks. This study argues that national government, local and foreign NGOs should place more emphasis on strengthen the household assets through providing alternative income options, education and training, robust housing and strengthening the security of existing livelihoods.

Keywords: Social capital, bonding and bridging networks, household assets, disaster resilience and recovery, Bangladesh coast.

3.1. Introduction

Bangladesh is highly susceptible to climate hazards, for example, cyclones, storm surges, coastal erosion and salinity (Disaster Management Bureau, 2010a). Cyclones and storm surges have become more frequent in the Bay of Bengal (Dube et al., 1997). A severe tropical cyclone hits Bangladesh, on average, every three years (Alam et al., 2011). These hazards cause enormous damage and loss of lives, livelihoods, infrastructure and economic assets, which increases community vulnerability to disasters. To reduce vulnerabilities and increase resilience, disaster risk reduction (DRR) and climate change adaptation (CCA) are at the top of the policy agenda of the Bangladesh Government (Ministry of Disaster Management and Relief (MoDMR), 2012, Ministry of Environment and Forests (MoEF), 2009, Disaster Management Bureau, 2010a). There is growing interest within the climate change and disaster research community to discuss the contribution of social capital to disaster resilience and recovery (Jordan, 2015, Aldrich, 2015, Minamoto, 2010, Aldrich, 2010b, Hawkins and Maurer, 2010, LaLone, 2012, Mathbor, 2007, Adger, 2003). Social networks are a crucial embodiment of social capital (Putnam, 1995). In order to address disaster vulnerabilities, local households rely on their social networking relationships – immediately after a disaster, coastal households of Bangladesh generally use their bonding networks (households' relationships with immediate family members and relatives) and bridging networks (households' relationships with neighbours and friends), because disaster response organisations take time to organise recovery efforts due to communication and access difficulties (Islam and Walkerden, 2014).

The contribution of bonding and bridging social capital to disaster recovery depends on the capabilities of the disaster-affected households to provide support to each other (within the community) through their existing capital assets. Household capacity and response to disaster resilience and recovery is frequently highlighted in disaster discourse (e.g., Paul and Routray, 2011b, Jordan, 2015, Zhang et al., 2012). Several studies have emphasised the relationships between household capacities and disaster recovery, DRR and CCA. For example, Islam (2011) showed that household livelihood assets (e.g. fishing boats, nets, livestock, etc.) are useful for recovering livelihoods of coastal people after a disaster. Household financial capacity (e.g. income, savings, foods, nutrition) and linking networks (e.g. access to institutional services) help the local people adapt to the changing climate

(Alam et al., 2013b). Alam and Collins (2010) found that lack of physical capital in the community (for example, unplanned settlements, nearby cyclone shelter centres, and transportation) is one of the major causes of people's vulnerability to cyclone hazards in coastal Bangladesh. Human capital (e.g. education and training facilities, income-earning household members, etc.) is an important factor in rehabilitating coastal livelihoods after disasters (Pomeroy et al., 2006). Access to various livelihood assets, for example, social, human, physical, financial and natural capital, significantly contribute to household incomes on the Bangladesh coast, which helps them recover from a disaster (Islam et al., 2011). Motsholapheko et al. (2011) found that household capacity to adapt to extreme flooding largely depends on strong physical and financial capital and access to natural capital. Existing literature has focused on the nexus between household assets (e.g. physical, financial, human, and natural) and disaster recovery; however, few researchers have discussed the relationships between these assets and social capital.

This paper aims to explore how households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks; identify the strengths and weaknesses of household assets; and finally find out possible options to strengthen these assets to contribute effectively to disaster resilience and recovery through bonding and bridging social networks. This will help to draw attention to the way households' assets (physical, financial, human, and natural) enable and weaken local households to contribute to disaster resilience and recovery. Thus, this paper begins by conceptualising the issues; in particular, disaster resilience and recovery, household assets, and bonding and bridging networks. It then describes the methods used in this study, and the empirical findings, to examine how various households' assets strength and weaken their contributions to disaster resilience and recovery. Finally, this paper highlights the limitations of household assets, and the opportunities to strengthen household assets to contribute effectively to resilience and recovery through bonding and bridging networks.

3.2. Understanding the issue: resilience and recovery, household assets, social capital

3.2.1 Resilience and recovery

Recovery is the actual process of restoration and improvement of facilities, livelihoods and living conditions of disaster-affected communities (UNISDR 2009), such as rebuilding infrastructure, providing housing, restoring health, social, and community services, and promoting economic life (Federal Emergency Management Agency-FEMA, 2011). Smith and Wenger (2007) defined disaster recovery as the process of restoring, rebuilding and reshaping the physical, social, economic and natural environment through DRR planning and post-event actions. Considered holistically, “recovery” is “putting a disaster-stricken community back together” (Mileti, 1999, p. 229).

Resilience is the community’s ability to return to its previous state after a disaster (Carpenter, 2013). The United Nations International Strategy for Disaster Reduction-UNISDR (2009) defined resilience as a community’s ability to resist, absorb, accommodate and recover from the effects of a hazard, and the restoration of its basic structures and functions. Resilience is the capacity of a community to adapt to environmental, social and economic changes. It is often described as a combination of three characteristics, for example, capacity for absorbing shock; capacity for self-organisation; and the capacity for learning and adaptation (Folke et al., 2002). These capacities have a profoundly social character, as Aldrich (2012) emphasises: cooperating and coordinating actions are central to them. In this study, we understand “resilience” to be the capacity for recovery, because this study focuses on responses to disasters.

3.2.2 Household assets

We understand “household assets” to be the useful or valuable thing or item of property, or person or opportunity of households available to cope with disasters, recover from disasters, and promote households’ resilience. This study considers *household assets* following the discussion of a *livelihood assets framework* (DFID, 1999, Chambers and Conway, 1992, Rakodi, 1999, Uy et al., 2010, Ellis, 2000). According to the livelihood asset framework, a household builds a livelihood by uniting five categories of assets or capitals such as social, physical, financial, human and natural capital (Ellis, 2000,

Scoones, 1998). These capitals are organized and employed by households to mitigate risk and build sustainable survival strategies (Scoones, 1998).

This study explores the current status of household assests of two Bangladeshi coastal villages and how these enable and constrain households to contribute to disaster resilience and recovery. The essence of using the *livelihood assets framework* is that the household assets are crucial for sustainable livelihoods and resilience (Ellis, 2000, Scoones, 1998). The conventional understanding here is that a community with more economic and livelihood opportunities has increased potential to reduce disaster impacts and promote resilience (Mayunga, 2007). The notion of *livelihood assets* is linked to sustainability (Smith et al., 2001), which is related to the idea of disaster resilience (Mileti, 1999, Tobin, 1999).

3.2.3 *Social capital, bonding and bridging social networks*

Social capital is typically defined as a function of trust, norms and networks (Joshi and Aoki, 2014). Social capital describes the relationships that knit together communities through a sharing of trust (Callahan, 2005). Social capital theorists define “social capital is an instantiated informal norm that promotes cooperation between two or more individuals” (Fukuyama, 2001). The term social capital refers to norms and networks that enable people to work collectively to resolve problems and achieve common goals (Stone, 2000). Focusing on *ties*, Nooteboom (2007) defined social capital as a stock of ties, the type and strength of such ties, and conditions for their functioning and their outcomes. This present study understands social capital concepts through the definitions given by Bourdieu (1984), Coleman (1990) and Putnam (1995). Bourdieu (1984) introduced social capital as those social ties that are used by elite groups to reproduce their privileged status. Coleman (1990) argued that social capital is an obligation, information, norms and social networks and is crucial for educational attainment. Our emphasis is on Putnam (1995, p. 67), who defined social capital as “features of social organizations, such as networks, norms, and trust that facilitate actions of cooperation for mutual benefit.”

Social capital enables households to deal with particular shocks (for example economic and disaster shocks). Therefore, households with more social capital, seem better able to

cope with certain shocks (Skoufias, 2003). Carter and Maluccio (2003) argued that social capital might enable informal insurance mechanisms (e.g. norms, trust, networks) to help households cope with disasters.

We understand *bonding social networks* as households' relationships with immediate family members and relatives, and *bridging social networks* as households' relationships with neighbours and friends. These networking relationships are crucial, because immediately after a disaster, bonding and bridging networks rely on each other immensely as disaster response organisations can take time to organise recovery efforts due to communication problems and access difficulties to the affected areas (Islam and Walkerden, 2014, Alam and Collins, 2010).

3.3. Methods

This study was conducted in the South Charduan and Tafaalbaria villages of Patharghata *Upazila* (sub-district) of the Barguna district, from February to July 2013. The villages are situated on the southern coast of Bangladesh. These villages were selected for several reasons: (a) they are highly prone to cyclones and storm surges; (b) Cyclone Sidr severely affected these villages and caused human deaths, and enormous damage to and loss of properties, crops, livestock and shelters (Multi Task, 2009, Islam and Walkerden, 2014, Islam and Walkerden, 2015); and (c) the villagers' experiences of Cyclone Sidr would be useful for developing cyclone disaster management policies for the Bangladesh coast.

Households were taken as the primary units of analysis, because households are the social unit through which villagers seek to recover from disasters. Rural households of Bangladesh are tightly knit, and household members work together in disaster recovery (Paul, 1998a) and collectively use their capacities to recover from a disaster. Households were randomly selected and household-heads were interviewed (as they usually speak on a family's behalf) to understand households' vulnerabilities, experiences and needs related to cyclones, using qualitative and quantitative questions.

This study used a mixed method approach. From the two study villages, 159 household-heads were interviewed face-to-face, and valid responses were obtained from 156 (74 from South Charduani and 82 from Tafalbaria). Household-heads were randomly selected based on the total number of households in the two villages, and a structured questionnaire was used for household-head interviews. During the interview session, questions were asked about the household's assets, and how these helped the households to contribute to the recovery process through bonding (household members and relatives) and bridging networks (neighbours and friends) after Cyclone Sidr. Household assets in this study include the physical, financial, human and natural capital that are explained through a set of indicators (Table 3.1).

Table 3.1 Indicators of various household assets

Household assets	Indicators
Physical	Land, housing and shelter centres, household goods, livestock and poultry, fishponds, drinking water sources, healthcare facilities
Financial	Household-heads' occupation, household income and expenditure, and savings and loans
Human	Education and training, family size, working and dependent members in the family, household-heads' age
Natural	Fishing opportunities, productivity of cultivated land, number of trees

A number of qualitative research methods were also used in this study. Qualitative investigations create a lens through which we can look at households' networks, trust, norms and reciprocity that are linked to post-disaster recovery (Chamlee-Wright and Storr, 2011). Eight Focus Group Discussions (FGDs) were conducted with the villagers to explore how affected households were able to recover through using their resources, and how they provided support to each other within the bonding and bridging networks. Thirty-seven Key Informant Interviews (KIIs) took place with community leaders, such as NGO workers, teachers, Imams, local government officials and village headmen. Workshops were held to discuss the issues with NGO officials. Interviews were also conducted with 14 disaster practitioners (national and international NGO officials and freelance researchers – Disaster Practitioner Interviews (DPIs)) to explore the views of national-level disaster experts. For interviews and workshops, semi-structured checklists were used. Together, this mix of methods enabled triangulation on key questions – particularly by comparing villagers', local leaders' and national experts' views on key issues, and by providing both qualitative and quantitative insights into the experiences of households.

Statistical Package for Social Sciences (SPSS) was used to analyse the quantitative data, and qualitative data were analysed by coding and grouping to identify key themes. To strengthen the reliability and validity, qualitative and quantitative data were correlated, and qualitative data was used to support interpretation of quantitative findings.

3.4. Household assets: how these enable and constrain households' contribution to disaster resilience and recovery

Households' assets are important factors affecting disaster resilience and recovery (Carter et al., 2004). Since the local community and households are the first responders in the aftermath of a disaster (Shaw, 2006), it is essential to explore their available assets, how these enable and constrain households' contributions to disaster resilience and recovery through bonding and bridging social networks. The discussion of household assets is organized in this paper based on the availability of assets and the local needs. For example, in the Bangladeshi coastal household context, after a disaster: first, they rely on social capital (bonding and bridging – based on networks, norms, trust and reciprocity); second, the disaster-affected households use their physical capital (housing, shelter centres, household goods, livestock, etc.); third, they rely on their financial capital (income, savings, loans, etc.); fourth, they depend on human capital (human resources – the working household members), and use their education, training, skills and experience to cope with disaster; and, finally, they rely on their natural capital for livelihoods, such as fishing in the sea, use of cropping fields, and forest lands (Household survey, FGDs, DPIs). However, all capitals are necessary because these are used in almost all circumstances such as before, during and after a disaster.

Assets are linked with livelihood strategies, risk reduction and better development outcomes (Meinzen-Dick et al., 2014), which increase the capacities of households to promote resilience. Household assets (social, physical, financial, human and natural) create a stock of capital which can be exchanged and employed to generate a flow of income or bring other benefits (Rakodi, 1999). The types of assets available to households in the coastal villages of Bangladesh, are outlined below with their strengths and weaknesses in contributing to disaster resilience and recovery.

3.4.1 Physical assets

Physical assets refer to the built environment, which comprises residential housing, public buildings and shelters, hospitals, schools, and so on. Physical capital is one of the most important resources required to build the capacity of a community to cope with a disaster (Mayunga, 2007). For example, physical infrastructure such as public shelter centres are essential for saving lives and properties during disasters. Physical assets determine households' adaptive capacity with extreme weather events/shocks. Households' physical assets (land, livestock, shelter) can play important roles in strengthening their capacity to adapt to climate change impacts (Báez Ramírez et al., 2012). Instead, lack of physical infrastructure can negatively impact on a community's capacity to cope with disasters. For example lack of risk mitigation measures for example levee, coastal farmers may reduce overall agricultural production due to saline water intrusion in the farming land (Báez Ramírez et al., 2012, Rakodi, 1999). Likewise, lack of public cyclone shelter centres and robust housing (physical infrastructure) can also increase the risk and vulnerability of Bangladeshi coastal households during cyclones. In this study, physical capital includes land, residential housing, public shelter centres, household goods, livestock and poultry, fishponds, and drinking water sources.

3.4.1.1 Housing and cyclone shelter centres

Housing quality is a key indicator of whether a community can withstand cyclones and sea-surges. Most of the coastal houses observed were fragile and of poor quality. There were three types of dwelling houses found in the study villages: *semi-pucca* 78% (floor: mud, brick and cement; walls: bamboo mats, timber, CGI sheet – locally called tin; and roof: CGI sheet); *kutcha* 18% (floor: mud; walls: bamboo, jute stick, straw; and roof: paddy/wheat straw), and *pucca* 4% (floor, walls and roof are made by brick and cement) (Household survey, Islam and Walkerden, 2014, see Appendix L). Ali et al. (2010) and Paul and Routray (2011b) also found *kutcha* and *semi-pucca* houses in the coastal areas of Bangladesh. These *kutcha* and *semi-pucca* houses are not cyclone and sea surge resilient. Consequently, the *kutcha* houses were fully damaged by Cyclone Sidr, and many victims died as houses caved in on them (New Age, 2007a). The *pucca* houses were somehow able to withstand cyclones and reduce households' damage and loss. However, very few *pucca* houses were found in the study villages (these are government-funded "community

housing”, locally called *abashan*), and few cyclone shelter centres (funded by government, NGOs and foreign donors) (see Appendix L). However, the survival capacity of *pucca* houses depends on the magnitude of cyclones and location of the housing (whether close to or outside embankments).

Existing cyclone shelter centres were unable to cope with the needs of the villagers. There were two shelter centres found in the study villages – neither was well maintained and they had less refuge capacity than the number of villagers (FGDs). The shelter centres were able to shelter hardly 2000 people while the total population of the two study villages was around 8000 (Charduani Union Information Service Centre, FGDs). Therefore, many people took shelter in elevated places, which were unsafe (FGDs). A focus group reported that due to the low refuge capacity of the shelter centres and the weak housing, many women and children took shelter on the roof of a school building. Moreover, the shelter centres were located far from the residents (about 2 km), and there was no transport or suitable roads to reach the centres (FGDs, Mallick et al., 2011a). The only option available to reach the shelter centres was by walking, which was difficult and unsafe in such rough weather (FGDs). In addition, many shelter centres were ill-equipped to accommodate women and girls, as separate toilet facilities and privacy for women were most often lacking (FGDs, Ahmad, 2011). Therefore, many women were reluctant to take refuge in the shelter centres before cyclones. For example, a focus group with women reported that due to lack of privacy for women they did not go to cyclone shelter centres during Cyclone Sidr. Also, due to lack of maintenance, many shelter centres of coastal villages were poor conditions and vulnerable to cyclones (Ahamed et al., 2012). Some shelter centres were also inundated during cyclones and storm surges; because they were built in the lowland areas (Islam, 2010). These poor conditions had also discouraged local people to take refuge in the shelter centres during cyclones.

From a social capital perspective, due to the weak housing “mutual support” and “cooperation” (Putnam, 2000) regarding sharing houses (within the bridging networks – amongst the neighbours who had lost their houses) was notably limited in the study villages after Cyclone Sidr. Because the *kutchha* houses were damaged, the local people were unable to provide shelter to other affected neighbours (Household survey, FGDs,

local KIIs). There were also very few stronger or newer houses in villages that withstood the cyclone and provided shelter to neighbours (FGDs).

3.4.1.2 Land, household goods, livestock and poultry, and fishponds

Household assets are a crucial factor in disaster resilience and recovery. Coastal households had limited assets (land, household goods, livestock and poultry, and fishponds) (Table 3.2). For example, they had limited homestead and farming land, which were on average 0.78 and 0.21 acre, respectively (Table 3.2). Twenty-three percent of households did not have homestead and farming land – they were living mainly on *khashland* (government-owned land). The national data shows that 20% of the people in Bangladesh are landless (Bangladesh Bureau of Statistics, 2010), which is a similar result to this study findings. According to the ownership of farming land (on average 0.21 acre), the households of the study areas were small/marginal farmers (Table 3.2) (households having land up to 2.5 acres are considered small farmers (Quasem, 2001)). Land helps the coastal people to recover from disasters, as people can cultivate crops and also sell their lands to face the crises (FGDs). However, coastal households cannot cultivate their land throughout the year due to saline water intrusion. Many of them also lost their land during disasters (due to riverbank erosion) (FGDs), which decrease their recovery capacity. Landlessness is one of the major causes of vulnerability of coastal people (Alam and Collins, 2010).

Due to their market value, livestock (cow, goat, sheep) and poultry (chickens, ducks) crucially support coastal households facing emergencies and promoting resilience (Parvin and Shaw, 2013). Livestock also plays a major role in households' lives and livelihoods, as these are used as their source of income. Therefore, any sudden loss of these assets can have a devastating impact on disaster-affected people (IRIN, 2012). This study found that 45% of households had livestock and 74% had poultry (Table 3.2). All household-heads confirmed that they had livestock and poultry that died during Sidr (Household survey). Since most of the coastal houses were not cyclone-resilient, and there were no safe places for livestock at cyclone shelter centres (*killas* – raised earthen platforms used as an initial shelter for livestock) (Paul, 2009), many households were unable to save their livestock and poultry during cyclones (FGDs, Local KIIs). Loss of livestock during Cyclone Sidr had reduced their recovery capacity (FGDs); as livestock damage is a big economic loss of

rural households (Garnett and Moore, 2010). Moreover, due to the impacts of climate change, local breeds of livestock and poultry are also under threat (DPIs).

Table 3.2 Household assets

Asset	Yes		Mean quantity	Average price Tk. (US\$)
	N	%		
Land ownership (Acre)				
Homestead land	118	76	0.78	531,818 (6,906)
Agricultural land	33	21	0.21	143,182 (1,860)
No land	36	23		-
Total land			0.35 acre	238,636 (3,099)
Livestock (number)				
Cows	48	31	2	23,510 (305)
Goats	20	13	2	4,810 (62)
Buffalos	2	1	4	70,000 (909)
Total livestock				98,320 (1,276)
Poultry (number)	115	74	8	1,487 (19)
Fishponds (number)	93	60	1	3,923 (51)
Household goods (number)				
Furniture	112	72	3	3,855 (50)
Electronic goods	28	18	1	2,891 (38)
Gold ornaments	101	65	1	10,152 (132)
Bicycle	2	1	1	2,250 (29)
Boat with engine	49	31	1	69,574 (904)
Boat without engine	46	30	1	11,211 (146)
Mobile phones	109	70	1	2,630 (34)
Solar power	91	58	1	19,191(249)
Fishing nets	27	17	1	22,143 (288)
Others (motorbike, van)	3	2	1	11,433 (148)
Total household goods				155,330 (2,017)

Note: Multiple responses. Number of cases 156. US\$ 1= Tk. 77 as of April 2013. Mean quantity counted based on the positive responses – who said “yes”. Source: Household survey, 2013.

Households had limited goods, for example, electronic items, gold ornaments, boat with engine and without engine, and solar power (Table 3.2). Though household goods have a price, they did not sell these goods because they were necessities. However, they had loans against some of the household goods – for example, boats and nets from moneylenders (*dadondars*¹⁴) and solar power from NGOs (Household survey, Islam and Walkerden, 2014). A local key informant (an NGO official) said, “liabilities of local people are more than their assets. Most of them have loans from various sources, for example, NGOs, moneylenders, banks and local shops.” Moreover, many households had lost their boats and nets during Cyclone Sidr (Household survey, FGDs). Households had limited gold ornaments, which could crucially help them to recover from a disaster (Table 3.1). The focus group with women reported that of the gold ornaments they had a nose-

¹⁴ *Dadondar* is an informal and traditional moneylender from whom fishers borrow money by verbal contract (conditional agreement) at excessive interest rates. Under this system, fishers borrow money in the off season against the sale of fish at a low price in the fishing season.

ring only, which was a sign of marriage and wellbeing of husband and conjugal life – the cultural practice and belief of rural women. Very few of them had necklaces, earrings or bangles; some sold and/or mortgaged these during the crisis after Sidr (FGDs).

Fishpond (both individual and group owner) is a crucial household asset, linked to households' income and nutrition, which increase their capacities to disaster risk reduction (Quisumbing and Kumar, 2011). The majority of households (60%) of study villages had fishponds (Table 3.2). It was observed during fieldwork that most of the fishponds were small and waterless. Few of them had water and fish, which are sources of income and drinking water. Many fishponds were damaged and lost their fish due to the overflow of water during Cyclone Sidr, which affected households' income and constrained recovery. (Younus et al., 2012, Islam, 2010).

Nets and boats are an important livelihood asset for the coastal households in Bangladesh. Few of the households of study villages had fishing nets (17% have own nets, Table 3.2), while the majority (67%) were involved with fishing (Table 3.3), and 61% had a boat (both with engine and without engine) (Table 3.2). This implies that some fishers worked in a group in another's boat, which are mostly run through the loans of moneylenders (Household survey, FGDs). Many households lost their nets and boats after cyclones, which affected their income and delayed recovery (Household survey, FGDs, Alam and Collins, 2010). Thus, through these limited assets, coastal households were not able to provide longer-term support to their family, neighbours and relatives (within the bonding and bridging networks) during emergencies (Household survey, FGDs). Therefore, they had to rely on linking social networks (NGOs, local government and other CBOs) for recovery support.

3.4.1.3 Water and sanitation

Water salinity is a major problem in the coastal areas of Bangladesh. Basar (2012) and Dasgupta et al. (2015) found that the people of coastal regions have been facing the problem of *water salinity* over the past couple of decades. The study villages also suffered from a lack of drinking water because of the salinity problem (Household survey and FGDs). Due to saline water, deep tube-wells were not suitable for the study villages. And due to lack of close water sources, local households often used boiled pond water and

water purification tablets and *fitkari* (Potassium Aluminium Sulphate is commonly used for water purification) (Household survey, FGDs). This reality was observed during fieldwork, and I also saw villagers collecting water far from their homes. A household-head said:

I bring drinking water from Khalifarhat, a local marketplace, where some tube-wells are available. It takes minimum two hours for a jar of water as this place is 2 kilometres far from my home.

The coastal women spend hours every day collecting water, as they need to go many kilometres to collect a pitcher of safe drinking water (Islam, 2013, Rabbani et al., 2013). Islam (2010) observed similar findings in another coastal district (Patuakhali), where villagers used to collect drinking water a long distance from their homes.

Lack of safe drinking water and water salinity have a negative impact on human health, because of the tolerance capacity of the human body. Islam (2013) found that salinity in the water of coastal areas has now reached over 20 parts per thousand (“PPT”, parts per trillion, it occasionally means “*parts per thousand*”), while the human body can tolerate only five parts per thousand. Therefore, a number of health problems were found in the study villages, such as diarrhoea, fever, skin disease and typhoid (Household survey, FGDs, Khanom and Salehin, 2012). These health issues also affect infant mortality, maternal hypertension, and post-partum morbidity and mortality (Dasgupta et al., 2015). For example, due to the small amount of water, ponds become polluted during the dry season (*Chaitra* month, mid-March to mid-April), which also causes various diseases (water-borne and skin), as pond water is often used for both cooking and taking baths (FGDs).

A number of initiatives have been implemented by NGOs and local government for safe drinking water in the coastal villages; for example, PSF (Pond Sand Filter – drinking and cooking water source, in which salinity tastes low) and rainwater harvesting (NGO workshops). However, there were some issues – for example, inequitable distribution, lack of maintenance of PSFs, and lack of technological support for rainwater harvesting. There were five PSFs in the study villages, and three of these were unusable. We also found two PSFs at the house of a UP (Union Parishad, the lowest local Government unit of

Bangladesh) Member (elected representative of UP); whereas many other communities were deprived of the benefits of PSFs. FGDs reported that by using his power, the UP Member (elected representative) set up two PSFs at his home. In addition, the local people did not have technological knowledge and equipment to fix damaged PSFs. Many NGOs set up PSFs and provided technological support during their project tenure only; after finishing the donor grants and project tenure, nobody took responsibility for fixing or maintaining them (FGDs, Local KIIs). NGO officials stated that there is a need to build community ownership of PSFs and to provide technological support and training to the community to maintain the PSFs (NGO workshops). Rainwater harvesting (at the household level through using big drums, and at the community level through using artificial ponds) is the best option to obtain safe drinking water in saline-prone coastal Bangladesh (Islam, 2013). Coastal inhabitants used to collect rainwater during the monsoon through their indigenous practices; for example, they usually used rooftop catchment to collect water and store in relatively small containers (e.g. earthen pots and plastic drums) (FGDs, Khan et al., 2011). This was largely practised on an individual basis in the study villages. Some NGOs encouraged the local people to harvest rainwater, but villagers did not have the modern technologies and reservoirs to do so. The quantity of rainwater harvesting depends on the ability of the households to organise a significant number of sizeable water-storing pots (Abedin et al., 2013). Consequently, local households expected technical and logistic support from government and NGOs to collect and use rainwater properly (FGDs).

There was a lack of sanitary latrines (*pucca paikhana*) in the study villages – very few coastal households had sanitary latrines (Islam et al., 2011). Poor sanitation facilities have dire health impacts, for example, coastal households suffer from diarrhoea, typhoid and other diseases (Islam et al., 2011, UNICEF, 2008). Sanitary latrines have been repeatedly damaged by cyclones, and it was difficult for the poorer households to replace these as latrines are costly (FGDs). Therefore, local households desired to receive sanitary latrines through local government and NGOs.

3.4.1.4 Healthcare services

Coastal households have limited access to healthcare services (Islam et al., 2011), and there were no healthcare services (community clinics) in the study villages (FGDs). To

receive healthcare services, villagers had to go to the Patharghata Upazila Health Complex that was located a considerable distance from the villages. Therefore, local people mostly received medical services from the pharmacies of *Khalifarhat* (nearer marketplace of Tadalbaria village) and *Charduani Bazar* (nearer marketplace of South Charduani village), where no MBBS doctors (basic medical degree holders, locally called *passer daktar*) were available (FGDs, local KIIs). The “Union Health and Family Welfare Centre” rarely housed a doctor or any medicine, and most often, treatment was provided through medical technicians. Thus, people sometimes received the wrong treatment for their afflictions (FGDs). This is almost a common scenario for other Union-level health centres of Bangladesh. For example, one centre had not had a doctor for the past four years; therefore, a health assistant provided treatment there (Samdani, 2015). NGO healthcare programs existed in the study villages, which were mostly confined to child and maternity health, and only their microcredit borrowers received this support. Therefore, government and NGO healthcare services should be strengthened and made more readily available to the villagers. Although, NGOs and local government were involved with distribution of post-disaster relief goods, healthcare support was still not adequate (FGDs).

From a social capital perspective, the physical assets (housing, shelter centres, household assets, water and sanitation, and healthcare facilities) of study villages were poor, which increased the vulnerability of coastal households to disaster. These vulnerable conditions did not allow households to provide longer-term support each other (within the bonding and bridging networks) after Cyclone Sidr (DPIs, FGDs).

3.4.2 Financial assets

Financial assets denote the resources that households use to achieve their livelihoods. It includes income, savings, investments and credit (Mayunga, 2007). Financial capital increases the ability of individuals, households, groups and communities to absorb disaster impacts and speed up the recovery process, which contribute to building community resilience (Mayunga, 2007). For example, the financial capability of a household can help families to take preparedness and preventive measures before a disaster and hasten the recovery efforts after a disaster. Household financial assets and capitals increase productions and income sources that enable households to minimise climate risks (Eakin and Bojorquez-Tapia, 2008). The income diversity (as a major component of financial

capital) strongly associate with a households' capacity to manage disaster risks (Ellis, 2000, Eakin, 2005). In contrast, financial crisis during disasters can affect household wellbeing; because this decreases new employment opportunity and the level of earnings of household members. It also increases the unemployment rate and the price of staple foods such as rice or wheat (Skoufias, 2003). In this study, financial capital includes occupation of household-heads, and income, expenditure, savings and loans of households.

3.4.2.1 Occupation of household-heads

Most of the coastal household-heads (67%) were involved in fishing-related jobs. For example, fishing (34% who catch fish by using their own boats and nets with a group of fishers through taking loans from moneylenders) and fishing labour (33% who catch fish on others' boats as a day labourer) were high (Table 3.3). And rest of 33% household-heads were involved with non-fishing activities for example agriculture, business, non-agriculture labour, etc. (Table 3.3). Paul and Routray (2011b) also found that the most dominant primary occupation of coastal households was fishing. The use of own boats and nets was comparatively higher among the South Charduanı villagers than the Tafalbaria villagers (Table 3.3).

Table 3.3 Household-heads occupation

Occupation	South Charduanı	Tafalbaria	Total
	%	%	%
Agriculture	8	9	8
Agriculture labour	3	15	9
Non-agriculture labour	3	5	4
Fishing	46	23	34
Fishing labour	31	35	33
Business	7	5	6
Service	1	0	1
Housewife	1	9	5

Source: Household survey, 2013

Alternatively, the incidence of fishing labour as an occupation was slightly higher in Tafalbaria than in South Charduanı (Table 3.3). The second most dominant occupation was agriculture, with 17% of coastal households involved in agricultural activities (both agriculture and agriculture labour) (Table 3.3). However, the number of villagers involved in farming and farming labour was significantly less than fishing in both study villages

(Table 3.3). Although it is common that coastal people mostly depend on fishing for their livelihoods, other reasons existed for higher dependency on fishing.

For example, due to saline water intrusion in the cropping land, coastal villagers were able to cultivate their lands only once a year, whereas, in other parts of Bangladesh, agricultural lands are used multiple times throughout the year (2–3 times for multiple crops). One household-head said, “If we’ve fish in the boat, we’ve rice in the pot”, which proves the extent to which coastal people depend on fishing. Responses from FGDs, local KIIs and NGO workshops also supported this conclusion of coastal people’s dependency on fishing.

3.4.2.2 Income and expenditure

Household income and expenditure is considered a proxy for economic status (Paul, 2010) and is the most important factor representing the coping capacity of people living at risk (Paul and Routray, 2010). Household income and expenditure is directly linked to resilience and recovery – higher-income households are more resilient than lower-income households. Also, those households whose expenditure is higher than their income are less resilient than higher-income families (Household survey, DPIs). Household expenditure is also an important factor used to identify the effect of savings and financial solvency on disaster recovery and resilience.

The annual household income of coastal people was low. The largest number of households (36%) had an annual income between Tk. 25,001 to 50,000 (Table 3.4). Non-farm activities (fishing and others) were the dominant source of household income (Table 3.3). For example, 83% of non-farm income was in the income ranges Tk. 25,001 to 50,000; 50,001 to 75,000; and 75,001 to 100,000 (Table 3.4). The prime expenditure sector was food. For example, of those belonging to income groups Tk. 25,001 to 50,000; 50,001 to 75,000; and 75,001 to 100,000 (Table 3.4), 88% of their expenditure was on food. Annual expenditure of coastal households was more than their annual income. The average annual household income was Tk. 82,576 (US\$1,072 as US\$1 = Tk.77 as of April 2013) and expenditure was Tk. 86,278 (US\$1,120) (Table 3.4). Due to this financial vulnerability, households had loans from various formal and informal sources (Fig. 3.1). The affected households also depended on institutional support (NGOs, local government,

and other community-based organisations (CBOs)), for example, emergency relief to manage the crisis (Household survey).

Table 3.4 Annual household income and expenditure

Range (Tk.)	Income %		Total %	Expenditure %		Total %
	Farm	Non-farm		Food	Non-food	
Below 25,000	61	3	1	3	80	1
25,001 to 50,000	24	37	36	47	15	19
50,001 to 75,000	12	34	32	29	5	37
75,001 to 100,000	3	12	15	12	0	24
100,001 to 125,000	0	6	6	5	0	8
125,001 to 150,000	0	4	1	.6	0	4
150,001 to 175,000	0	1	1	0	0	2
175,001 to 200,000	0	5	4	1	0	2
Above 200,000	0	6	4	1	0	3

Note: Multiple responses (Farm 33, and Non-farm 155). Number of cases=156. Source: Household survey, 2013.

The annual income of coastal households does not support them in maintaining a decent life and required food intake. According to the methods of Food Energy Intake (FEI) and Direct Calorie Intake (DCI), an individual with a daily calorie intake of less than 2122 kilo-calories is considered to be in “absolute poverty”, and less than 1805 kilo-calories is considered to be in “hard-core poverty” (Government of Bangladesh, 2012a). Hossain (2010) showed that the cost of the minimum food intake for every adult (to get 2122 kilo-calories) is about Tk. 49 per day. Following this estimation, every adult requires Tk. 1,470 per month just for food. In this regard, a family having 4.76 members (average family size of the study villages) requires a monthly income of Tk. 6,997 and annual income of Tk. 83,966, which is more than the annual average income (Tk. 82,576) of coastal households. According to this approximation, the studied households belong to the group of “absolute poverty” because this limited income does not support them to intake 2122 kilo-calories of food per day. In addition, the World Bank (2011) identified people whose daily income is less than US\$1.25 as “extreme poor”, and people who have a daily income below US\$2 as “moderate poor”. This implies that people of the study villages were “extreme poor”, because per person daily income was only US\$0.62 (as the average annual household income of the study villages was US\$1,072, per day per household was US\$2.94 – which is per person per day only US\$0.62, based on the average household size of the study villages). These poor conditions made the coastal community more vulnerable to disasters.

4.2.2.3 Savings and loans

Saving is one of the important factors used to assess household financial capacity. There was a significant gap between household income and expenditure – expenditure was more than income (see section 3.4.2.2).

Households received loans from different formal and informal sources (Fig. 3.1). The majority of the households (56%) in the study villages had dues (more than Tk. 5,000 on average) to the local grocery stores and pharmacies where they shop for daily essentials and medicines (Table 3.5). Moneylenders were the key source of loans (average amount was Tk. 85,261) (Table 3.5). Villagers used this amount for fishing boats and nets. This informal moneylending arrangement is often blamed for exploiting the fishers (Blowfield and Haque, 1995), because moneylenders always determine the fish price at 10–20% less than the actual market rate. If the local fishers protest against this injustice, the moneylenders usually ask fishers to refund the loaned money. The fishers could not refund the dues due to debts from different sources (FGDs). Local fishers said that they were tied down to selling their fish to moneylenders. The moneylenders considered them as captive, and the fishers as slaves (FGDs). Despite this unfair provision (selling caught fish to moneylenders), fishers usually depend on moneylenders due to lack of alternative loan sources and difficulties in receiving bank loans (FGDs). Instead, few households used cooperatives as an informal loan source. Only 3% of households used local cooperatives, where they borrowed on average Tk. 7,230 (Table 5). This implies lack of fishers' cooperatives in the study villages, which would enable fishers to bargain with moneylenders for a fair fish price and to advocate their needs to various stakeholders (e.g. NGOs, local government, and the Upazila Fisheries Office).

Table 3.5 Households' loan

Sources		Yes %	Mean amount (Tk.)
Informal	Relatives	30	4,072
	Neighbours & friends	23	4,038
	Local shops & pharmacies	56	5,181
	Moneylenders	47	85,261
	Cooperatives	3	7,230
Formal	Banks	50	32,655
	NGOs	76	29,897

Note: Multiple responses. Number of cases 144. Source: Household survey, 2013.

Most households (76%) used NGOs as a formal loan source, and the average loaned amount was Tk. 30,000 (Table 3.5). The number of borrowers from NGOs was higher than the number of borrowers from banks (50%) (Table 4). However, people showed their discontent with the high-interest rate of NGO loans. Obtaining a loan from an NGO was comparatively easier than obtaining a bank loan, because, for a bank loan, the borrower needs to submit their land deeds (FGDs). It was difficult for many coastal households to submit land deeds as they had limited land assets and 23% of households had no land (Table 3.2). However, some fishers received bank loans through bribery to the local brokers (FGDs). One household-head said, “It’s sometimes possible to get bank loans without land deeds through providing bribes to the brokers” (who have close relationships with bank officers).

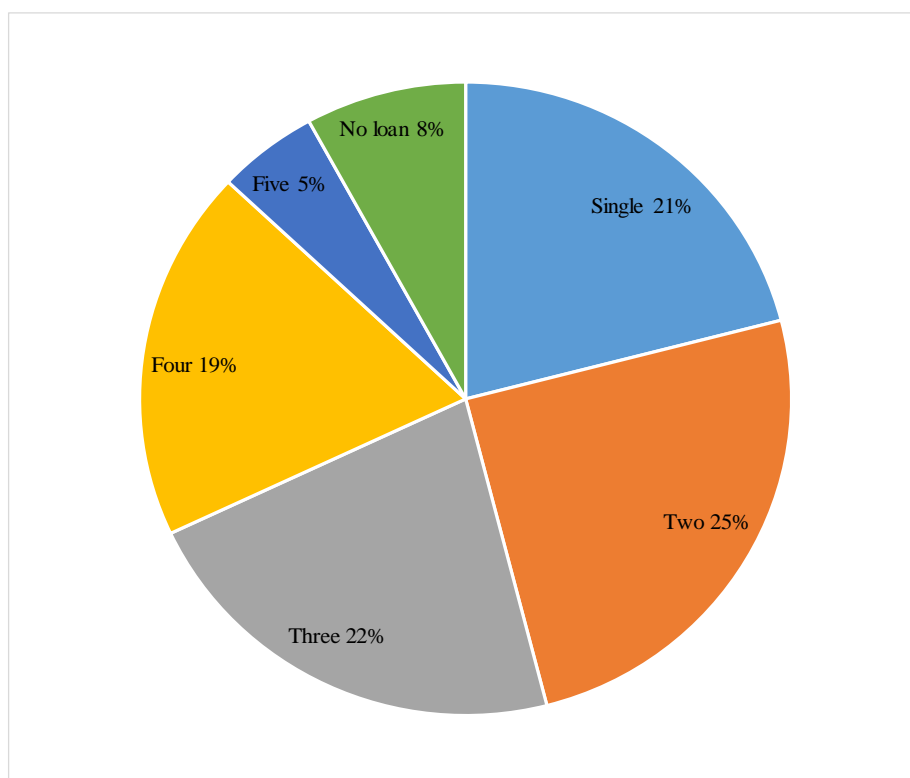


Figure 3.1 Number of loan sources of households.
Source: Household survey, 2013.

Households used a number of loan sources, which increased their loan burden. Among the households, 25%, 22%, 19% and 5% used two, three, four and five sources at a time, respectively (Fig. 3.1). Eight percent of households did not take out any loans (Fig. 3.1) because they thought their limited income would not support them to repay the loaned money (Household survey). The average loan amount of coastal households was higher

than the national average loan amount. National data shows that in rural areas of Bangladesh, the average loan per household is Tk. 21,804 (Bangladesh Bureau of Statistics, 2010), which is lower than that of the three major loan sources for coastal households – moneylenders, banks and NGOs (Table 3.5).

A number of causes were found for households' inability to repay the loaned money and for the increase in their debt burden; for example, frequency of cyclones, loss of farming land by coastal erosion (for which they received bank loans), and loss of nets and boats from cyclones (that were mostly prepared through moneylenders' loans) (FGDs, DPIs, local KIIs). The above discussion indicates that households' financial assets (occupation, income, and savings) were poor. Therefore, they were mostly unable to support each other (within the bonding and bridging networks) after Cyclone Sidr (see Chapter 2, Section 4.3 and 4.4 & Islam and Walkerden, 2014).

4.3.3 Human assets

Human assets/capital is probably one of the most important elements of resilience among all forms of capital (Mayunga, 2007). It includes possession of knowledge and skills that are recognised in a specific cultural context (Healy and Hampshire, 2002). Human capital is the capabilities, embodied in the working-age population, that allow them to work productively with other forms of capital. It is referred to as knowledge and skills that are accrued through education, training and experience. Human capital also refers to the physical ability of the working population (Smith et al., 2001). People's disaster experience (a crucial factor of human capital) helps them to cope with, adapt to, and recover from disasters (DPIs). For instance, individuals' knowledge and skill on hazards, hazard history and hazard risk would be an important resource for household and community resilience. Having an adequate, skilled and trained workforce is a prerequisite for capacity building. This implies that the more human capital available in the household, the greater the capacity for building resilience (Mayunga, 2007).

Natural disasters can affect households' human capital through death and injury of household members, job/income loss, and children's dropout from schools. Also, during a period of crisis, households may be decreased the healthcare and nutrition costs for their children, which affect the human capital as a whole (Skoufias, 2003). In this study, human

capital includes education and age of household-heads, family size, working and dependent members of the family, and training.

4.3.3.1 Education, training and employment

Education and training plays a crucial role in human resource development (Rao, 1966), and enhances human capital (cf. Callaghan and Colton, 2008). The education rate amongst coastal households was below average; for example, 42% of household-heads had up to primary level education, 10% were illiterate, and 38% were able to sign their name only – they did not know how to read or write (Table 3.6). Due to the low education level, household-heads were not involved with other jobs (in government or private organisations) outside their community. Therefore, most of them were associated with fishing and agriculture-related works in their villages (see Table 3.2).

It was evident in the study villages that the school dropout rate of male students was higher than for females, because after a certain age, boys usually drop out and become involved with fishing, where they can earn an income for their family. Also, due to the government initiative to introduce free education for female students, there has been a substantial improvement in female student enrolment in both primary and secondary education over the past two decades (Hong and Sarr, 2013). However, the early marriage of girls, who then drop out of school, is still a major problem in the coastal villages.

Table 3.6 Household-heads' education

Level of education	South Charduani	Tafalbaria	Total
	%	%	%
Illiterate	11	10	10
Can sign only	35	40	38
Up to primary	41	44	42
Up to secondary	14	5	9
Graduate	0	1	1

Source: Household survey, 2013.

There is a significant positive relationship between education and disaster recovery. Educated households have more coping and recovery capacity than less-educated households in the cyclone-prone areas of Bangladesh (Paul and Routray, 2011a). For example, many educated (up to level 10–12) household members were working (as

garment workers and shipyard labours) in the big cities (Dhaka and Chittagong) and were able to provide regular cash/remittance support to their family after Cyclone Sidr (Household survey, Islam and Walkerden, 2014). It was also evident that educated households had a better understanding of disaster warning signals and a higher ability to store food and save money, which were useful in reducing disaster vulnerability and enhancing resilience (Paul and Routray, 2011b). However, DRR and CCA issues are not properly addressed in the education curriculum (DPIs, NGOs workshops), and this is seen as a crucial element for building climate resilience in future generations.

In addition, training in DRR and CCA substantially helps to enhance community resilience. This study found a lack of these training programs in the communities. NGOs, local government and other CBOs were mostly involved with emergency relief activities (FGDs). Disaster practitioners said that NGOs mostly focused on hardware-based works (e.g. distribution of relief, cash, drinking water, sanitation, etc.) and less software-based works (e.g. training, awareness, disaster drill, local level planning, etc.). Islam et al. (2011) found NGO training was useful for fishers to improve awareness, build leadership and capacity, and interact with other stakeholders. But there was a lack of such training programs in the study villages and the impact of such training has not been fully reflected in this study.

4.3.3.2 Family size, working and dependent members in the family

Household size in coastal areas is higher than the national average. The household size in the study villages was 4.76 people (Household survey), which is higher than the national data for rural areas (4.53) (Bangladesh Bureau of Statistics, 2010). Compared to other rural areas of Bangladesh, the population growth rate was higher in the coastal areas. Poverty, illiteracy, less access to family planning services, uncoordinated family planning programs, and early marriage were the potential causes of the higher population growth rate in this region (DPIs).

Table 3.7 Family size, number of working and dependent members in the family

Members	Working members %	Healthy adults %	Dependent %
None	1	1	5
One	60	6	27
Two	28	56	32
Three	8	14	21
Four	3	16	14
Five	-	5	2
Above five	-	2	-

Note: Household size = 4.76. Source: Household survey, 2013.

The number of working and dependent members in the family affects disaster resilience and recovery. The households with more than one member earning an income did better during recovery after a disaster than those dependent on only one earner (Jabeen et al., 2010). Coastal households had less working members – 60% of households had only one earning member (Table 3.7).

The average number of working and dependent members in the family was 2. The dependent family members who did not have a job were a burden for coastal households. The average number of healthy adults in the family was about 3 (Household survey). From a human capital perspective, this implies that coastal households had the working force but had less working opportunities. Healthy family members are important for disaster resilience and recovery – families with more able-bodied members are able to recover sooner after a disaster than families with unhealthy members (Household survey, DPIs, local KIIs).

3.4.3.3 Age of household-heads

Age is an important factor in disaster resilience and recovery. Old age increases the likelihood of disaster vulnerability; although their life experiences may help households to cope with disaster (Paul and Routray, 2011b). The majority of household-heads were young – 19% were in the age group 26–30 (Household survey). The average age of household-heads was 42 years, which implies that in coastal Bangladesh, households' main breadwinners were middle-aged. Twelve per cent of household-heads in the above 60 years age group indicates that senior citizens also worked as the main income earners, despite having the physical inability to continue regular earnings. In the study villages, involvement of senior citizens in the main income earning activities existed due to the absence of young working members in the family, lack of male household members, and

because younger sons form a separate household (Household survey, FGDs). Such a condition has increased old age insecurity and broken down the traditional joint family. Younger family members and household-heads would provide more recovery assistance than older people after a disaster (cf. Haines et al., 1996). For example, post-disaster income diversification was higher among the younger groups of household-heads than the older groups, as the aged were unable to carry out labour-intensive work (Paul and Routray, 2011b).

From a resilience and human capital perspective, the households with younger members are more resilient and able to recover sooner after a disaster than the households with older members. From a social capital perspective, a low level of household human capacity (education, training, and employment, household size, working and dependent members in the family, age of household-heads) cannot properly support the households' recovery (within the bonding networks).

3.4.4 Natural assets

Natural assets refer to natural resources, such as water, minerals, oil, and land that provides space for people to live and work (Smith et al., 2001). It is essential not only for human life but also for all forms of life. In the disaster resilience context, natural capital plays an important role in protecting coastal areas from cyclones and floods (Mayunga, 2007); for example, mangrove forests can save coastal communities from the impacts of cyclones and coastal flooding. From the experiences of the study villages, villagers said that the "Haringhata mangrove forest" (adjacent to the study villages) saved them during Cyclone Sidr, as this was able to reduce the strength of the cyclone (FGDs). The natural assets help people depend for their survival, just like financial, social or physical assets. Natural assets also contribute to other social capitals and securities such as income, employment, and health (Ericksen, 2008). Natural capital sustainably enhances the community capacities and fosters long-term adaptation to climate change. Instead, the crises of natural assets are also a responsible reason for increasing household vulnerability (Lemos et al., 2013). Paul (2013) defined natural capital as households' access to open water bodies, forests and grazing lands, fertility of cropping land, and adequacy of

irrigation water for cropping land. This study considers fishing opportunities, productivity of cultivated land, and number of trees as the natural capital of households.

3.4.4.1 Fishing opportunities and livelihoods

The livelihoods of coastal Bangladeshis are mostly based on fishing-related activities, for example, catching and drying fish, fish marketing, and net and boat making. However, the coastal people cannot catch fish throughout the year and fishing opportunities (specially catching *hilsa*¹⁵ fish) are gradually declining (Mome, 2007). For example, coastal people can catch hilsa fish for only five months of the year, from mid-May to mid-October (Bengali month *Joystha* to *Aswin*). For another five months, from November to mid-March (*Kartik* to *Falgun*), they are in fact involved with casual jobs, for example, mud cutting as a day labourer (at the rich peoples' houses of their own village or adjacent villages), catching small fish (such as *Bagdapon*, the fish spawn – juvenile size of shrimp) and *Kaun*¹⁶ (species of catfish), and pulling a *rikshaw* (a three-wheeled passenger cart) in nearer city areas through short-term migration. The remaining two months from mid-March to mid-May (*Chaitra* to *Baisakh*) are the neediest time for these people due to the incidence of unemployment (Household survey, FGDs, local KIIs, NGO workshops).

Coastal fishing in Bangladesh has been facing some challenges. First, catching fish during *ban time* poses a big threat to local livelihoods and to the future generations of hilsa fish (Ahmed and Troell, 2010). The Ministry of Fisheries and Livestock of Bangladesh has imposed a 10-day ban (locally termed as *obarodh*, during full moon – *Purnima*) in October (*Aswin*) on catching, selling, marketing and importing hilsa, because during this time, adult fish migrate to the rivers from the deep sea for spawning (FGDs). The ban time is beneficial for the long-term interests of fishers so they can catch more fish in the future. However, some fishers continue to catch hilsa during ban time through providing bribes to coastguards and local police stations, which is a big threat to future

¹⁵ *Hilsa* is the national fish of Bangladesh. It is the most popular and tasty fish locally known as *Ilish*. Hilsa is found in the Padma-Meghna-Jamuna delta of the Bay of Bengal. Catching hilsa fish is a major livelihood option in coastal Bangladesh.

¹⁶ *Kaun* is one of the species of cat fish. Fishers need special skills to catch them, as they live in the soil holes under water. Fishers have to dive into the deep water (10-15 *hat* i.e. 15-20 feet) and set the nets outside their holes (FGDs).

generations of hilsa. Second, the use of banned nets (*current and badha*¹⁷) is also a major threat for the livelihoods of local fishers. A local key informant reported, “Last season we weren’t able to catch the expected quantity of fish, as the river was full of banned nets”. FGDs reported that by using *badha* nets, some dishonest fishers regularly catch and kill hundreds of tonnes of juvenile fish, including younger hilsa. These small-sized fish are usually used as food for the cultivated fish in the private farms (*gher*) or in the ponds. One focus group reported that if it is possible to stop *Jatka*¹⁸ catching (the juvenile size of hilsa) during October and November (mid-*Aswin* to end of *Kartik*), they could catch hilsa fish the whole year round. Ahmed and Troell (2010) found that due to lack of alternative livelihoods, poor people sometimes engaged in larvae fishing, which is one of the major challenges during ban time (Ahmed and Troell, 2010). An Upazila Fisheries Officer said, “We usually run mobile courts, seize banned nets, and burn them. However, due to lack of manpower, we can’t do it regularly.” In addition, along with Bangladeshi fishers, illegal fishing by the fishers of Myanmar and India is also a major problem. Indian fishers often enter 50–60 kilometres inside the Bangladesh sea areas and catch fish freely. The Indian fishers also disturb Bangladeshi fishers by damaging their fishing nets and boats, even beating them when they protest (Rahman, 2013). Third, fishers are sometimes tortured by the forest robbers and pirates (even sometimes by the forest officers and coastguards), which makes earning a livelihood difficult for the poorer coastal households. For example, a household-head that was kidnapped by pirates was finally released from captivity through providing a hefty ransom (Tk. 225,000), though some fishers were killed by the pirates (Household survey).

From a resilience perspective, coastal peoples’ livelihoods are vulnerable due to uncertainties of fishing, proneness to illegal fishing, and fear of sea pirates (as fishers are being abducted along with their trawlers, fish and nets, and released only after they pay extortion money). Such vulnerabilities of livelihood and lack of alternative livelihood options in the villages obstructed the recovery of coastal households after Cyclone Sidr.

¹⁷ There are different fishing nets available in the coastal areas of Bangladesh, for example (a) *Badha jal*—height 40 *hat* i.e. 60 feet, are used for catching small fish; (b) *Current jal*—height 30 *hat* i.e. 45 feet, are used for catching *Jatka* fish; (c) *Chandi jal*—height 20 *hat* i.e. 30 feet, are used for catching *hilsa* fish in the river/channel of sea; (d) *Lakko jal*—height 30 *hat* i.e. 45 feet, are used for catching medium and large fish; (e) *Lasher jal*—height 90 *hat* i.e. 135 feet, are used also for catching hilsa fish in the deep sea; (f) *Char jal*—height 15 *hat* i.e. 23 feet, are used for catching small fish. Among those, the *Badha* and *Current* nets are most harmful, as they kill small fish and *Jatka* (FGDs, local KIIs).

¹⁸ *Jatka* is the younger size (smaller than an inch) *hilsa* fish. Catching this is prohibited. However, some fishers catch it illegally by providing bribes to the local law enforcing agents.

3.4.4.2 Productivity of cropping land

Due to salinity, soil fertility is relatively low in the coastal regions of Bangladesh, which limits the productivity of agricultural crops throughout the year, and in severe cases, total yield can be lost (Haque, 2006, Mahmuduzzaman et al., 2014). This scenario is very threatening to the primary production system and affects the dominant crop (*Aman* rice) (Haque, 2006). Because of saline water intrusion, farming production is unstable in the coastal villages, as farmers cannot cultivate cropping land the whole year round. They can grow only one crop per annum (locally called *aksona* land) (Household survey, Islam and Walkerden, 2014). In the study villages, many uncultivated lands were observed which were not cultivated due to saline water intrusion and lack of alternative saline-resilient crop varieties.

3.4.4.3 Number of trees

Trees are considered to be one of the more significant sources of household income in coastal Bangladesh because trees provide economic benefits to the households and protection from cyclones (Rabbani et al., 2013). Both fruit (e.g. banana, coconut, betel nut, mango, jackfruit, etc.) and timber (e.g. rain tree, mahogany, raj koroi, etc.) trees were found in the study villages (Household survey, Islam et al., 2013). The coastal trees usually face two major challenges. First, most fruit trees are relatively sensitive to salinity. Due to saline water, many trees (both fruit and timber) in the study areas were dead (FGDs). Second, the frequency of cyclones harms and destroys (through uprooting) many trees. Damage to trees badly affects households' economy, as trees have market value that can enable households to recover from a disaster. There are some native plants that can grow well in saline soil, for example, coconut, betel nut, mango, jackfruit, guava and palm. Among them, coconut and palm are strong saline-tolerant species in the coastal areas of Bangladesh (Islam et al., 2013). Therefore, many CBOs are creating awareness among coastal people and recommending they plant saline-tolerant palm trees to reduce climate change consequences at the household level (Mangroves for the Future, 2013).

3.5. Policy implications: opportunities to strengthen household assets

The analysis above leads to the following policy recommendations. These are designed to strengthen households' assets and capacities to contribute effectively within bonding and bridging relationships to disaster resilience and recovery on the Bangladesh coast.

3.5.1 *Provide strong housing and increase facilities in the cyclone shelter centres*

Robust housing is needed for the coastal households to minimise the damage and loss from disasters. Other reasons for providing strong housing are:

- most of the coastal houses observed during fieldwork were not strong enough to withstand cyclones, as most of them are *semi-pucca* and *kutchha* (as discussed above in section 3.4.1.1).
- due to fear of losing household goods and resources (e.g. furniture, fishing and cropping equipment, livestock, poultry, pet animals, foods, etc.) (Paul and Routray, 2013) and lack of a congenial atmosphere for the women, pregnant and disabled in the shelter centres, people usually do not want to leave their homes during cyclones (Household survey, FGDs).
- there is also a strong belief and lack of a disaster education among the elderly people that homes should not be empty during a disaster (FGDs). Local belief is “at least one person should stay inside a house during a disaster. Otherwise, misfortune will come to the family”. For example, one household-head reported:

My father didn't agree to move to a safer place keeping the homes empty. Only then, he agreed to move to a safer place, when I assured him, somebody, will take care of homes in absence of you.

Therefore, strong housing is needed for the coastal households; but poor coastal people are unable to build strong houses. The government, in collaboration with national and foreign NGOs and donors, should provide strong housing (two-storey buildings – pucca houses) to the local people, which would more likely withstand the effects of a disaster. This housing should be built in a safer place (outside embankments) and on own land. One disaster practitioner suggested that the government should provide houses as interest-free loans for 20 years, and in this case, government rules (that are practised at Dhaka city to allocate

plots/flats) could be followed. The local people also agreed that they would receive this housing if the opportunity arose (FGDs). Interested households would receive these houses via an allocation system, and community participation should be ensured to avoid further conflicts.

Moreover, there is a need to increase facilities in the cyclone shelter centres. Cyclone shelter centres were found not to be gender friendly and did not cater to the privacy of women (section 3.4.1.1). Separate rooms and toilets should be provided for women and adolescent girls. NGOs, local government and community volunteers could specify the separate rooms and toilets for women in the existing shelter centres. The government, foreign NGOs and other donors should prioritise gender issues in times of building further shelter centres. There is also a need to arrange different places in the shelter centres for livestock and poultry, as these are crucial livelihood options for the rural poor people. Paul (2009) found *killas* were not located adjacent to public cyclone shelters, which was a reason for villagers' unwillingness to take refuge in the shelter centres – they could not take their livestock with them. During fieldwork, we did not see any *killas* near the shelter centres of study villages. Mallick et al. (2011a) resonantly suggested to introduce *killas* at all shelter centres for the safety of livestock. Building multi-purpose cyclone shelter centres (e.g. mosque, school, hospital, and public and NGO offices-cum-shelter centres) should be a priority in the coastal areas, as this would provide multiple benefits for the community.

3.5.2 Increase water, sanitation and healthcare services

Lack of safe drinking water and sanitary latrines are a major problem in the coastal areas of Bangladesh, and this creates many health issues (as discussed in section 4.1.3). For supplying safe drinking water, PSFs should be set up to meet the needs of the villagers. Local and foreign NGOs should provide training and technical support to maintain the PSFs, because regular water quality monitoring and maintenance of PSFs could ensure the availability of safe drinking water for coastal Bangladesh (Harun and Kabir, 2013). Local NGOs can help the people through forming a “community committee” for each PSF to maintain it, thus, community ownership would be created. A couple of good examples of maintaining PSFs through “community committees” in the other coastal

villages were found during fieldwork, and this could be the starting point for establishing further committees.

NGOs should provide technical support (training, large drums or reservoirs) to the coastal households for rainwater harvesting, as local people do not have any modern technologies or facilities to preserve rainwater (section 3.4.1.3). In addition, due to repeated cyclones, sanitary latrines are frequently damaged, and it is difficult for the local poor people to repair or replace these due to the high cost. Local government and NGOs should supply the sanitary latrines either free or at a low cost. Similarly, healthcare services should be made available and improved to protect against some common diseases that exist due to disaster impacts, lack of safe drinking water and lack of sanitary latrines.

3.5.3 Strengthen existing livelihood security and create alternative livelihoods

Both fishing and farming opportunities need to be secured, as these sectors are facing challenges (as discussed in section 4.4.1). *Jatka* fishing and use of banned nets (e.g. *current* and *badha* – small mesh that kills lots of juvenile fish) should be strictly controlled through joint actions and transparency of coastguards, local law-enforcing agents, and political leaders. During *ban time*, the ice factory should be closed so that opportunist fishers could not freeze their catch (FGDs); local government leaders, NGOs and law-enforcing agents must work together with the owners of ice factories. Government and local law-enforcing agents should strengthen the security measures to protect against sea pirates through providing additional manpower for the coastguard. Physical torture of fishers and illegal behaviour of forest officers should be stopped, as they sometimes take fish forcefully from the fishers (FGDs).

Moreover, saline-water-resistant rice and crop varieties should be increased to promote multiple uses of farming land, as saline water intrusion means local farmers can grow only one crop per annum (as discussed in section 3.4.4.2). For example, a salt-resistant paddy – *BRRI Dhan-47* (Invented by the Bangladesh Rice Research Institute) – has been cropping in the coastal region and the farmers are achieving good yields (FGDs, NGO workshops). This should be popularised (through NGOs and Upazila Agriculture Offices), and many other alternatives need to be adopted. It is necessary to promote alternative farming (e.g.

sunflower, watermelon, potato etc.) and utmost use of farming land. As a potential crop, potato cultivation should be promoted, as the local sandy-loam soils are suitable for potato farming, and cold storage has already been built in the study areas (DPIs, NGO workshops). Government and NGOs should provide loans, seeds and technical support to promote this alternative farming. There is also a need to introduce saline-resistant fishing, animal husbandry, poultry and trees to cope with the changing climate because many local breeds cannot be sustained in the adverse situation of climate change.

Alternative income options should be created in the coastal villages in order to increase household capacities and build community resilience against the effects of disaster. Households could increase their number of fruit and timber trees and be more likely to withstand disasters, as households with strong resources (both monetary and in kind) can recover quicker than households who are less asset-based. Knowledge and skills on disaster preparedness and alternative livelihoods should be promoted, so that coastal people can avoid depending on a single livelihood option (DPIs).

The government should provide interest-free/low-interest loans for both the farming and fishing community so that households can discard moneylenders' loans and emerge from the debt trap. The government also needs to put measures in place to discourage male students dropping out of school early and to discourage the early marriage of female students, in order to build human resources in the coastal region (as discussed in section 3.4.3.1). The government and NGOs could introduce vocational training facilities for coastal people, which would provide additional job opportunities for local people within the country and abroad.

3.6. Conclusion

This study aimed to explore how households' assets enable and constrain their contributions to disaster resilience and recovery through bonding and bridging networks on the Bangladesh coast. This paper described households' assets following the discussion of *livelihood asset framework*.

- From a physical capital perspective, most of the coastal houses are not cyclone and sea-surge resilient, as these types of houses were built using weak building materials (mostly mud, bamboo, straw, timber, CGI sheet, and in a few cases brick and cement) (as discussed above in section 3.4.1). Consequently, most of the houses were damaged by Cyclone Sidr, so local households were only able to share limited shelter facilities within bridging networks (e.g. neighbours and friends). Due to weak houses, people usually rely on public shelter centres to take refuge before cyclones. Inadequate cyclone shelter centres, lack of a gender-friendly environment within the centres, and unsuitable communication systems (both roads and vehicles) between residents and shelter centres impedes people from obtaining the full benefit of the shelter centres. In addition, lack of separate places for livestock in/near the centres leads to increased damage and losses for households. Coastal people have limited household assets (household goods) and productive assets (lands, livestock, poultry, fishponds, and fishing and farming equipment) to recover from a disaster. In addition, due to poor water and sanitation conditions, people suffer from various diseases, and these are not adequately dealt with due to limited healthcare services. This weak physical capital makes the coastal households more vulnerable to cyclones and limits their ability to provide support through bonding and bridging networks.

- From a financial capital perspective, coastal households were not able to provide longer-term recovery support each other for example within the bridging networks (neighbours and friends) in the community after Sidr. Household-heads' occupation, annual households' income and expenditure, and their savings and loans indicate that coastal households had limited financial capital. Their annual income was less than expenditure, which leads families to take loans from various sources; moreover, frequent disasters increase their financial vulnerability (section 3.4.2). The poor financial conditions constrained households' recovery after Cyclone Sidr. Limited income also impacts food consumption; consequently, household members do not receive the required food intake (daily per person 2122 kilo-calories), which affects health and nutrition and further impacts households' productivity.

- From a human capital perspective, members of the coastal households have limited capacity to help the family after disasters. Education, training, employment, age and household size are the important indicators for human resource development. Households' human resources were not developed due to the lower level of education and training, which bound the household-heads to involve with fishing and agriculture-related work. There are also limited training programs on DRR and CCA in the study villages, which has an impact on creating a disaster- and climate change-resilient community. Household size (4.76) of the study villages is higher than the national average (4.53), and coastal households have less working members; they also have dependent members. However, every household has the able-bodied working member, but there is a lack of working opportunities in the villages; therefore, the dependent members are a burden for family. Middle-age people (average 42 years) are mostly occupied as the households' main breadwinners, which is helpful for family recovery after disaster, as younger household-heads are more active in post-disaster income earning than the older household-heads.

- From a natural capital context, coastal households are vulnerable as they are not able to catch fish throughout the year and have few alternative uses for cropping land. Fishing is a main livelihood option for the coastal households. However, this is full of uncertainties, as they can only catch fish five months a year and the rest of the year means hardship for them. Other uncertainties in fishing are: illegal fishing during the ban (spawning) time, use of banned nets, physical assault by forest robbers and sea pirates, and exploitation of moneylenders (details are in section 3.4.4). These uncertainties make fishing more insecure and vulnerable. There are also uncertainties in farming. Due to saline water intrusion in the cropping land, the coastal people are able to grow only one crop per annum (discussed above in sub-section 3.4.4.2). Though trees are considered an important form of natural capital for households (due to their market value and utility), these are also vulnerable because of salinity and frequency of cyclones.

Within their limited assets, most of the cases households were not capable of providing longer-term recovery support to family members and relatives (within bonding networks), and neighbours and friends (within bridging networks) after Cyclone Sidr.

The findings suggest that the national and local government, Upazila (sub-district) Agriculture and Fisheries Departments, and national and foreign NGOs should help the coastal households to secure their existing livelihoods through securing sea-fishing and alternative uses of cropping land (as discussed above in section 3.5.3). They need to create additional job opportunities for sustainable livelihoods – these would strengthen households' financial capacity, which could enable them to contribute to disaster resilience and recovery and help each other better within the bonding and bridging social networks (discussed above in section 3.5.3). In addition, increasing water, sanitation and healthcare services in the communities would protect villagers from water-borne diseases and enable household members to recover faster from a disaster (discussed above in section 3.5.2). Providing strong housing and increasing facilities in the cyclone shelter centres would reduce damage and loss of properties and livestock (discussed above in section 3.5.1).

The empirical findings of this study provide a new understanding of how other asset-based forms of capital (physical, financial, human and natural) contribute to social capital (bonding and bridging networks) and promote disaster resilience and recovery. While this study has considered two villages, the findings are expected to be able to be applied generally along the Bangladesh coast, because the households' assets, capacities, hazards and vulnerabilities are very similar in other coastal villages (Alam and Rahman, 2014).

Chapter 4-Paper 3: How do links between households and NGOs promote disaster resilience and recovery? – A case study of linking social networks on the Bangladeshi coast

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This chapter addresses a part of key research questions for example, when linking social networks (households' relationships with NGOs) contribute well and poorly to disaster resilience and recovery, and how can the capacities of NGOs (as a linking network) be strengthened for effectively contribute to disaster resilience and recovery. Addressing these questions, it identifies the strengths and weaknesses of NGOs.

This chapter describes NGOs' strong and poor performance in disaster recovery activities. It explores NGOs post-disaster well support for example emergency relief, shelter, and livelihood assistance. This also explores NGOs' poor activities after disaster for example unfair relief distribution and involvement with bribery. These are the key contribution of this chapter through which it is identified how a linking social capital involved with unfair activities during distribution of recovery support following a disaster. This chapter also identifies the drawbacks of NGOs microcredit, which negatively impact on the recovery process and affects trustworthy relationships between households and NGOs. This chapter identifies possible options to strengthen NGOs post-disaster recovery activities for providing more robust support to the affected households. This chapter also recommends the pathways to fair distribution of recovery support through effective community participation in the recovery activities.

How do links between households and NGOs promote disaster resilience and recovery?: A case study of linking social networks on the Bangladeshi coast

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Abstract Households' links with NGOs are an important support for disaster resilience and recovery in Bangladesh. Previous studies have examined how social capital promotes disaster recovery. However, few explore the complexities of linking social networks and, in particular, the role of NGOs, after disasters. Through a case study of Cyclone Sidr—2007 affected two coastal villages of Bangladesh, using household surveys, focus groups, and key informant interviews, this study examines when these linking networks perform well and poorly. NGOs provide strong support through immediate relief (food, water, medicine, household utensils), shelter (building materials, new houses), and livelihood assistance (microcredit, cropping seeds, livestock, fishing boats, and nets). However, this catalyzes relief dependency also, NGOs generally favour households they lend to, sometimes demand normal repayments continue even though a disaster has occurred, and often take bribes when they are distributing livelihood assistance to households. We suspect many Bangladeshi NGOs focus on relief activities rather than preparedness, because post-disaster relief provides significant opportunities for financial irregularities, as the cash flows (donor support) are relatively large. Instead, NGOs should increase their emphasis on disaster risk reduction, providing more robust housing and fostering alternative livelihood options rather relief centric activities, because households' have a strong preference for empowerment and resilience, rather than relief dependency.

Keywords Social capital · Linking social networks · Disaster resilience and recovery · Cyclone Sidr · Bangladesh coast

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1 Introduction

Social capital is gradually being recognized as a vital issue in the disaster management domain. In recent years, there has been an increasing interest among disaster scholars, academics, and practitioners in social capital, especially since the Indian Ocean Tsunami and Hurricane Katrina, that is reflected in current scholarship (Aldrich 2010; Chamlee-Wright and Storr 2011; Joshi and Misa 2013; Murphy 2007). Over the past few years, a body of literature has explored ‘social capital’ in terms of the strengths and weaknesses of the networks within and between communities (Murphy 2007). Social networks enable collective action in communities. Among other things, these networks provide information that individuals and communities use as they pursue their goals following disasters (Ritchie and Gill 2007). In the recovery phase of Hurricane Andrew 1992 in Louisiana, individuals who received more social support experienced better physical health and lower levels of depression than individuals who received less (cf. Varda et al. 2009). Islam and Walkerden (2014) found that immediately after a disaster, affected households depend on *bonding networks* (relationships with immediate family members and relatives) and *bridging networks* (relationships with neighbours and friends) to cope with crises—support from outside, the affected area is not available initially and local organizations take at least a few days to regroup. The capacity of these bonding and bridging networks is limited by the networks’ physical and financial capital, the strengths and weaknesses of these horizontal relationships, and the magnitude of the disaster. For longer-term recovery, disaster victims usually need support through *linking social networks*, for example from local government, NGOs, and other community-based organizations.

Linking social networks—households’ links with organizations—form an important part of support for disaster recovery (Carpenter 2013). Households’ links to local and national NGOs provide opportunities for people to express their needs and receive recovery support (Aldrich 2011b). The aim of this study was to explore how links between households and NGOs promote disaster resilience and recovery. This study reports a case study of two coastal villages in Bangladesh affected by the devastating Cyclone Sidr in 2007. Sidr, a category 4 cyclone, was the most destructive cyclone of the last decade. Sidr caused damage and loss of about 1.6 billion US dollars and human casualties of 3406. More than 55,000 people were injured and about 9 million affected by Sidr (Economic Relations Division 2008).

The increasing involvement of NGOs in disaster resilience and recovery has been noted by several authors. Benson et al. (2001) reported that NGOs play a significant role in disaster *mitigation* and *preparedness*. Likewise, Allen (2006) claimed that NGOs play a vital role through providing funds, disaster management knowledge, and helping households to improve their financial resilience (by undertaking additional kinds of income-generating activity, e.g. tailoring). In Bangladesh, NGOs also have a good record in assisting people to *recover* from disasters (Khan and Mozaharul 1991). Ikeda (2009) found that in the disaster prone areas of Bangladesh, NGOs support through casual employment and health services help communities to recover from crises. Khan and Rahman (2007) show that NGOs make significant contributions through partnerships and networks with local stakeholders, for example local government, community-based organizations, and households. Berkes and Ross (2013) highlighted how this work leads to social learning. Aldrich (2011a) identifies that local connections with NGOs help disaster victims recover more quickly and easily.

Diverse recent studies (e.g. Aldrich 2010; Hawkins and Maurer 2010; Minamoto 2010; Storr and Haeffele-Balch 2012; Zhao 2013) have shown the fundamental connection between social capital and disaster recovery. However, there is much less scholarship addressing the intricacies of *linking social networks* and, in particular, the role of NGOs, after disasters. Some researchers have discussed the positive contributions of NGOs to disaster recovery; problems with these contributions (e.g. favouritism and corruption) have received much less scrutiny. This paper attempts to take stock of, and critically reflect upon, the contribution of NGOs (as a component of households' linking networks) to disaster resilience and recovery.

We focus on both the early/short-term recovery phase (which lasts for up to a month after a disaster, during which NGOs usually provide emergency relief such as food, water, sanitation, and medical assistance) and the long-term recovery phase (which typically lasts from a month to several years after a disaster, during which NGOs engage with reconstruction and rehabilitation works, such as providing new houses, and livelihood support, such as providing microcredit) (Baird 2010; Islam and Walkerden 2014). We address the following research questions, using the experience of a major cyclone in a particular area of the Bangladeshi coast to illuminate them, paying particular attention to households' experiences: How well do NGOs contribute to disaster recovery—what are their strengths and weaknesses—and what options are there for strengthening NGOs' contributions to disaster resilience and recovery trajectories?

2 Disaster resilience and recovery viewed through a social capital lens

Resilience is the community's ability to return to its previous state after a disaster (Carpenter 2013). Resilience is often described as a function of capacities to self-organize, learn, and adapt (Federal Emergency Management Agency-FEMA 2011; Folke et al. 2002). These capacities have a profoundly social character, as Aldrich (2012) emphasizes: cooperating and coordinating action are central to them. Recovery, likewise, is inherently social. Considered holistically, 'recovery' is 'putting a disaster-stricken community back together' (Mileti (1999), p. 229).

This study orients from the accounts of social capital given by Bourdieu (1984), Coleman (1990) and Putnam (1995). Our emphasis is, as Putnam (1995), p. 67 puts it, on 'features of social organization [...] that facilitate coordination and cooperation for mutual benefit'. Three aspects of social capital are often differentiated—networks, norms, and trust (Berke et al. 2008; Hishida and Shaw 2014). In this analysis, we focus particularly on networks and trust.

Social networks are relationships that develop between individuals and/or groups (Carpenter 2013). Individuals' social networks are commonly differentiated into bonding networks (with family members), bridging networks (with neighbours and friends), and linking networks (with organizations) (Woolcock 2001). This study focuses on a key group of linking social networks, from a disaster recovery perspective: households' relationships with NGOs. Disasters trigger a shift in the way households' relationships with NGOs function: NGOs help with emergency relief, sanitation, shelter, health, and livelihood recovery; and new relationships between households and NGOs may form.

From a village perspective, NGOs fall into three main groups: locally created NGOs, national NGOs that have local outlets supported by the national organization, and international NGOs whose contributions underpin a lot of relief and recovery works through

local and national NGOs. Most local and national NGOs run substantial microcredit programs in coastal regions of Bangladesh, as well as contributing to disaster management (Khan 2008; Parvin and Shaw 2013). In our study area, all local NGOs identified, contributed to disaster recovery, and provided microcredit (NGO workshops, DPIs). Our research focuses on disaster recovery, with a particular emphasis on microcredit, because these are key supports for villagers and because recommendations around these themes have the potential for wide application in Bangladesh.

3 Study area and methods

The growing emphasis on Bangladesh, as a cyclone vulnerable country (Dasgupta et al. 2014), makes the Bangladeshi coast an appropriate location for this study. The cyclone and storm surge affected coastal communities enable us to examine how social networks are used during disaster recovery. The study was conducted in South Charduani and Tafalbaria villages of Patharghata *Upazila* (sub-district) of Barguna district, during February to July 2013. The villages are situated on the southern coast of Bangladesh (Fig. 1). The study villages were selected for several reasons: (a) they are highly prone to cyclones and storm surges; (b) Cyclone Sidr severely affected these villages and caused 344 deaths, which was 4 % of total population of the villages, and about 90 % of houses were destroyed (Multi Task 2009); and (c) consequently, these villagers reactions to Cyclone Sidr reveal aspects of resilience and recovery in extreme circumstances, which we expected to be useful for developing cyclone disaster management policies for the Bangladeshi coast. Cyclones and related storm surges have many subsidiary effects in these areas, including flooding, saline intrusion into agricultural land, and erosion (Alam and Rahman 2014). Though the current study is based on two study villages, the findings regarding NGOs' contributions to disaster resilience and recovery are expected to apply generally along the Bangladesh coast, as the hazards and vulnerabilities, the villages' socioeconomic characteristics, and the capacities of NGOs are very similar in this region (Alam and Rahman 2014).

Households are taken as the primary units of analysis, because households are the social unit through which villagers seek to recover from extreme events. Bangladeshi village households are tight-knit and work together in disaster recovery (Paul 1998a), and it is primarily as household units that villagers relate to NGOs. Household heads typically speak on families' behalves (Alam and Collins 2010). We randomly selected households and interviewed household heads to understand households' vulnerabilities, experiences, and needs related to cyclones, using qualitative and quantitative questions. Mixed methods approaches of this kind are an effective method commonly used to investigate households' recovery in these regions (Mallick et al. 2011; Paul 2012; Paul and Routray 2011). We interviewed 159 household heads via face-to-face interviews and obtained valid responses from 156 households (74 from South Charduani and 82 from Tafalbaria). Household heads were randomly selected based on the total number of households in the two villages, a sampling approach similar to that of Minamoto (2010). We used a structured questionnaire for household-head interviews and observation to understand the physical settings and the everyday lives of villagers. During the interview session, questions were asked about the effectiveness of NGOs' initiatives to rebuild the community and return it to 'normal' after Cyclone Sidr.

Along with surveys, a number of qualitative methods were employed in this study. Qualitative investigations create a lens through which we can look at households'

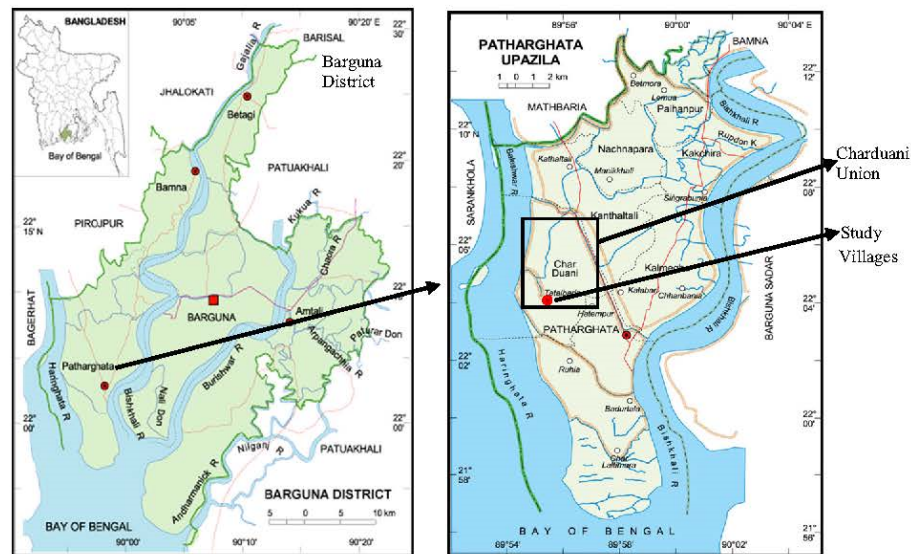


Fig. 1 Location map of the study area. Source Banglapedia, 2006

networks, trust, emotions, and needs that are linked to post-disaster recovery (Chamlee-Wright and Storr 2011). Four in-depth case studies were conducted to understand individuals' experiences in recovering from Cyclone Sidr. Eight focus group discussions (FGDs) with the villagers were conducted to explore how affected households perceived the threats of cyclones, faced the recovery challenges, and benefited from NGOs. Thirty-seven key informant interviews (KIIs) took place with local leaders, including NGO workers, local government officials, and village headmen, and we held workshops to discuss issues with journalists, local government staff, and NGO officials. Interviews were also conducted with five policy-makers (executives of ministries and departments—Policy-Maker Interviews (PMIs)), and 14 disaster practitioners (national and international NGO officials and freelance researchers—Disaster Practitioner Interviews (DPIs)) to explore the outlooks of national level disaster experts. Together this mix of methods enables triangulation on key questions—notably by comparing villagers', local leaders', and national experts' views on key issues and by providing both qualitative and quantitative insights into households' experiences (Creswell and Clark 2007).

Statistical Package for Social Sciences (SPSS) were used to analyse the quantitative data, and qualitative data were analysed by coding and grouping to identify key themes (Islam and Walkerden 2014; Schutt 2011). To strengthen the reliability and validity, qualitative and quantitative data were correlated, and qualitative data were used to support interpretation of quantitative findings.

4 Results and discussion

4.1 Linking social networks, vertically across the community

Households' links with organizations are an important factor for disaster recovery, and the most dominant variable in the social capital index developed by Islam et al. (2011). The

household survey found that 96 % of household members are linked to NGOs, and many households are involved with other groups (Table 1). Most households were only involved with one other kind of organization/group, besides NGOs. Household heads, FGDs, and local KIIs reported that relationships with local organizations/groups are useful in disaster recovery, as they provide support to the local people. Likewise, disaster practitioners said that the coastal people who were connected to organizations had a better understanding of climate change and its effects, and received more adaptation and recovery support than the people who were not connected. They also stated that due to poverty and limited physical and financial capacities, coastal people rely on other groups and organizations to get emergency support.

Household heads, FGDs, and local KIIs explained their involvement as arising from a mix of personal benefits (e.g. loans, spiritual/religious satisfaction, livelihood support) and community benefits (e.g. search and rescue, post-disaster recovery support through water, sanitation, food, and non-food relief). Each of NGO workshop, FGDs, DPIs, and local KIIs indicated that NGOs provide two key supports to local people: microcredit and emergency relief. National data also showed that in 2000, on average, each rural community was home to three or more NGO programs and over 90 % of villages in the country had experienced the operation of at least one (Ikeda 2009; Siddiquee and Faruqi 2009). This study found that 76 % of coastal households loaned from NGOs and 71 % simultaneously used more than two NGOs as loan sources (Household survey); this highlights NGOs' availability and people's access to them. NGOs are actively working in all 19 coastal districts in Bangladesh (Ahmad and Rahman 2011).

Occupational groups (e.g. farming and fishing groups) are important advocates for local people, including after a disaster. However, there are limited occupational groups (e.g. farming and fishing groups) found in the coastal areas, and only 21 % and 6 % of household members are involved with fisherman or farmer groups, respectively (Table 1). Disaster practitioners, policy-makers, and an NGO workshop confirmed that there were insufficient occupational groups to bargain for the rights of fishers and farmers and that this was particularly important after disasters. Farming groups are needed to advocate for introduction of alternative crops in the salinity affected land—'one crop land' (*aksona jomi*—one crop per annum). Fisher groups are needed to advocate against illegal fishing and the loan terms of moneylenders (*dadondars*). Fishermen are obligated to sell their catch to moneylenders, who provide funds for nets and boats (Blowfield and Haque 1995). However, moneylenders usually take advantage of this and set the price of fish at on

Table 1 Types of organizations/groups the household members belong to

Organizations/groups	Percent
NGOs	96
Fishermen groups	21
Religious groups/mosque committees	21
Union Parishad	18
Youth groups/clubs	11
Political parties	10
Village volunteer committees	9
Finance groups/cooperative associations	8
Farmer groups	6
Educational institutes	5

Number of cases 141. Multiple responses. *Source:* Household survey 2013

average 10 %–20 % lower than actual market prices—usually a very high interest rate in practice (FGDs, NGO workshops). These financial arrangements are particularly difficult for fishers after disasters.

Direct involvement with local government, i.e. Union Parishad (UP), and local units of national political parties is much lower than NGOs: 18 % and 10 % of household members are formally involved in UP and local political parties, respectively (Table 1). Household heads, FGDs, DPIs, and NGO workshops also confirmed a lower level of involvement of people with local political groups. Many households have informal connections with the local political leaders, however.

4.2 Linking social networks: household/NGO interfaces

In Bangladesh, NGOs are in the process of taking over the traditional role of government in organizing relief assistance for disaster victims (Ikeda 2009; Khan and Rahman 2007; Matin and Taher 2001; Mondal 2000; Paul 2003). Mondal (2000) argued that NGOs contribute to the process of social capital formation through encouraging cooperation on tasks for mutual benefit (e.g. helping each other with harvests, building homes, and repairing boats) and through training microcredit group members to improve their quality of life.

4.2.1 Kinds of post-Sidr support: strengths of NGO recovery works

Most of the Sidr affected households received support from the NGOs. NGOs provided emergency relief (foods, such as rice, oil, pulses, nutritional support for children, and cookies, and non-food items, such as emergency medical, cash, and candles) (household survey, FGDs, local KIIs, and Parvin and Shaw 2013). In addition, NGOs provided WASH (water, sanitation, and hygiene), shelter, agricultural and fishing equipment, and psychosocial care after Sidr (ActionAid Bangladesh 2010). The support was both at the early and long-term recovery phases (Table 2).

Many households received emergency relief support, but substantially less income-generating livelihood support, for example cropping seeds, poultry, and livestock, was available (Table 2). One hundred percent of respondent households received some kind of relief support from NGOs (Table 2). Masud-All-Kamal (2013) found that most of the coastal households of Bangladesh received relief materials from NGOs after Cyclone Aila, but that NGOs made a relatively small contribution to livelihood support in recovery phases. NGOs provided sufficient support through building materials to repair damaged houses, but provided limited new houses to replace houses that were destroyed. Ninety-six percent of households received partial building materials, but only 21 % received new houses (Table 2), even though 90 % of houses were destroyed by Sidr (Multi Task 2009). Sixty-nine percent of households had to find other ways (e.g. local government support, and personal loans) to rebuild (household survey, FGDs). All the affected households wanted, but did not receive, help to build houses that were strong enough to withstand cyclones (FGDs, local KIIs, NGO workshop). The houses that were rebuilt or repaired were either *semi-pucca*¹ or *kutcha*² (Islam and Walkerden 2014)—both very vulnerable to cyclones (Chowdhury et al. 1993).

¹ *Semi-pucca* houses are mostly made by mud, occasionally brick and cement used for floor/foundation; walls are made by bamboo, timber, and CGI sheets, and roof is covered by the CGI sheets, locally called tin.

² *Kutcha* houses are made by mud, walls are made by bamboo, jute stick, and straw, and roof is made by straw.

Table 2 NGOs' post-Sidr recovery support

Recovery phases	Support types		Percent
Early recovery phase	Emergency relief	Foods and non-food items	100
		Water and sanitation (drinking water, and sanitary latrines)	94
		Household stuff (cooking and other household essentials)	83
		Essentials for children	52
Long-term recovery phase	Housing	Partial building materials	96
		New houses	21
	Livelihood	Fishing boats and nets	87
		Cropping seeds	41
		Poultry and livestock	27
		Microcredit	89

Number of cases 156. Multiple responses. *Source:* Household survey 2013

The support provided by NGOs to households after Sidr fell short of what people needed in many ways (Parvin and Shaw 2013); the local NGOs acknowledged that they had limited resources to fully support these victims. In particular, NGOs need to be able to provide more robust housing for the coastal people. Local people desire help from NGOs to rebuild stronger houses when the houses they have had have been damaged or destroyed. Local NGOs emphasized that they are only able to do this via collaborative projects between government, and national and international NGOs. Similarly, Nadiruzzaman and Paul (2013) found that several NGOs collaborating with donor agencies (e.g. Muslim Aid, European Commission, Concern Worldwide, and World Vision) provided housing for Sidr survivors in the other coastal villages of Bangladesh. However, the NGOs' support for children was useful and appreciated by the local people. NGOs post-Sidr psychosocial support through recreational activities (e.g. songs, dance, sports) in their schools helped children to recover from post-traumatic stress disorder (FGDs, NGO workshop); children are usually more psychologically traumatized than adults after a disaster (Choudhury et al. 2006). Paul (1998b) argued that in the 1990s, NGOs did not take initiatives to offer psychological support to disaster victims, focusing simply on distributing relief goods. He recommended that NGOs consider initiating such services as part of their disaster recovery work. Currently, some NGOs have introduced post-disaster psychological support which was appreciated by the local community. Household heads, FGDs, and local KHIs reported that support for children's essentials (foods, clothes, books, bathing buckets, etc.) was useful. It was a large and welcome shift in disaster management in coastal Bangladesh for relief goods to include items to address the specific needs of children, the elderly, disabled, and women, and these facilities were limited though (DPIs, Coirolo et al. 2013). However, the support for children made a very striking contribution. From talking to households and disaster practitioners, more and better coordinated support for children would be very beneficial.

Despite NGOs' significant support after Sidr, some systematic *weaknesses* were found. For example, NGOs' inability to provide timely support to the affected people, lack of coordination of emergency support, favouritism during provide support, difficulties

regarding repayments, the interest rates of microcredit, and corruption. These are discussed in the following sections.

4.2.2 Timeliness and coordination of post-Sidr support from NGOs

Eighty-seven percent of household heads reported that NGOs did not provide relief immediately after Sidr (Table 3). NGOs reached the affected area 3 to 5 days after Sidr (FGDs, local KIIs). Since the coastal households are closely linked to the NGOs, they expected a faster response. But in reality, NGOs could not respond immediately after Sidr as they need a minimum of 48–72 h to reach the affected areas—sometimes longer due to the distance, communication and access difficulties, and limited resource as well (DPIs). Alam and Collins (2010) also acknowledged the delayed response of NGOs and said that institutional relief can take 4 to 5 days to reach the devastated areas.

Coordination of NGOs' relief activities is also an area of weakness (DPIs; PMIs; FGDs; Begum 1993; Khan and Rahman 2007). Disaster practitioners claimed that an invisible competition exists among the local NGOs to get donor funding. The donor agents usually provide funding through an open bid. Therefore, local NGOs do not share information and coordinate with each other. At a local level, after cyclone Sidr, cooperation among NGOs and between NGOs and other stakeholders, and participation of local communities in relief distribution, was relatively weak, which leads to inefficiencies, repetition of relief, and distrust (DPIs, FGDs). Similarly, Berke et al. (1993) argued that governmental and non-governmental programs that exclude local involvement are poorly coordinated and create conflict.

4.2.3 NGOs favour their own microcredit borrowers

NGOs generally favour their own borrowers—the households they provide microcredit to. Eighty-two percent of household heads reported that this occurred during relief distribution (Table 3). FGDs and local KIIs also reported that NGOs gave preference to their own borrowers when providing relief and livelihood support, for example the distribution of livestock, poultry, nets, and boats. A household head claimed that 'people badly affected sometimes were not included in the NGOs' distribution lists, as they emphasized their members only'. Paul and Hossain (2013) similarly found that flood affected households of Northern Bangladesh (70 % of households) were dissatisfied with NGOs, because they only distributed relief assistance to their microcredit borrowers. Disaster practitioners explained that NGOs usually favour their own borrowers, because if they help them, then they will be able to continue repaying their debt following the disaster. Paul (1998b) found the same during the Tangail Tornado in 1996; NGOs were not involved in the distribution

Table 3 NGOs' weaknesses appearing after Sidr

Weakness	Percent
Did not come immediately after disaster	87
Did not make loan interest-exempt during the crisis	84
Favouritism during relief distribution	82
Did not provide temporary shelter	72
Demanded regular loan instalments during the crisis	56
Bribed people during livestock, nets, and boats distribution	31

Number of cases 156. Multiple responses. Source: Household survey 2013

of relief aid if their borrowers were not affected. NGO staff reported (in workshop) that they usually favour their own borrowers during times of relief work, but that they considered other victims as well.

Although all respondents received relief goods from NGOs (Table 2) and 96 % of coastal people are involved with NGOs (Table 1), favouritism creates discrimination among households (Mallick et al. 2009, DPIs). Most of the local NGOs were unable to provide many relief items except some rice and dry foods—cookies, and puffed rice (FGDs). The local outlets of big national NGOs (e.g. BRAC, Grameen Bank, ASA, and Proshika) were able to provide better support than local NGOs, because of their donor funding and own financial capacities; their emergency support units are also stronger than the local NGOs. As a result, a ‘sense of deprivation’ and unhappiness are common among members of (i.e. borrowers from) small NGOs (FGDs, DPIs). On top of this, 10 % of households in our sample were not involved with any organizations (Table 1) due to their lack of interest and/or distrust, and uncertainty about benefiting from membership (Household survey). This group of people are also particularly disadvantaged, following disasters, when NGOs favour their own borrowers.

4.2.4 Interest accruals during disasters

During the crisis, most NGOs did not stop charging interest on (microcredit) loans, and they sometimes demanded that normal repayments continue (Table 3), which increased burden for the poor affected people (a finding also reported by Shoji (2010)). The affected households expected that since there was massive damage and loss, that NGOs would make that period interest-exempt. Local NGOs said that they could not stop interest accruing, but that they did not collect instalments for up to 6 months after Sidr. FGDs and local KIIs reported that a few NGOs did not collect instalments for only a couple of months after Sidr, but that most kept up the pressure for repayments.

The interest rate of NGOs’ microcredit is higher than other financial institutions. Forty-four percent of household heads do not know this; the other fifty-six percent of household heads were aware that they had higher interest rates than other financial institutions, but none knew the exact interest rate that NGOs’ were charging for microcredit (Household survey). There are several causes of peoples’ unawareness of interest rates. Sometimes NGO workers simply do not advise borrowers of the rates—and some borrowers are uninterested in the interest rate as they are desperate to get loan funds, and lack alternatives. The NGO workshop reported that interest rates are clearly written on the borrowers’ passbook, but due to illiteracy, many borrowers are unaware. Rahman (2007) claimed that loans from the NGOs carry a relatively high rate of interest (at least 25 %) compared with banking rates; a point that Karim (1999) and Shoji (2010) also make. In recent years, there has been a criticism that microfinance institutions (MFIs) charge their poor borrowers unreasonably high interest rates (Institute of Microfinance 2014). Fernando (2006) identified four key factors in the high interest rates of MFIs: the cost of funds, operating expenses, loan losses, and profits needed to expand the NGOs’ capital for future growth. Despite the high interest rate of NGOs’ loans, local households borrow from them, because they are easy to get, collateral free, they have limited alternative sources of funds, and bank loans are difficult to get. The main purpose of microcredit is to provide poor and low-income households with an affordable source of financial services. Having the interest rates so high makes it difficult for disaster-affected poor coastal households to cope financially; disasters substantially increase their debt burden.

4.2.5 Bribery during distribution of relief

NGOs often take bribes during the distribution of livelihood support, for example, when providing livestock, nets, and boats. Thirty-one percent of household heads claimed that NGO workers received bribes from them (Table 3). Disaster practitioners said that post-disaster corruption is higher than during normal times. Lewis (1996) had earlier identified cyclone relief as an area where corruption was suspected. One representative of an international NGO confirmed that due to corruption during relief distribution, they cancelled the partnership of a local NGO after Sidr. A local key informant said that an NGO worker lost their job after Sidr, because they took bribes. A household head claimed that ‘those who were able to pay bribes, they got nets and boats from NGOs’. FGDs reported that some people received cows/calves by paying Tk. 5000 as bribes, and some peoples’ names were cut from the distribution list because of their inability to pay the bribes. In addition, some NGOs distributed lower-priced nets and boats: for example, an NGO received Tk. 200,000 (US\$ 2597) per boat and spent Tk. 80,000 (US\$ 1039),³ which was only 40 % of the total budget; the balance was pocketed by NGO staff (DPIs, FGDs, meeting with journalists). Paul (1998b) claimed that, in Tangail in 1996 following a tornado, most emergency assistance was run smoothly, effectively, and without irregularities, interference, and corruption. In our case studies, however, multiple data sources confirm the presence of significant corruption. Mahmud and Prowse (2012) claimed that NGO workers are one of the most active groups in post-cyclone corruption in Bangladesh (e.g. through influence peddling, nepotism, and bribery). Similarly, Paul and Rahman (2006) found that most households that survived a cyclone on two Bangladeshi islands failed to receive relief and rehabilitation items due to extensive corruption in the NGOs’ providing relief. In our case study areas, many NGOs claimed that although a few NGOs mishandled funds after Sidr, many complaints were not true. They argued that some mismanagement was normal when handling such a huge disaster like Sidr. They also claimed that people’s expectations were high regarding getting everything through NGOs. Due to limited resources, it was not possible; therefore, corruption was claimed (NGO workshop).

Many NGOs focus on post-disaster relief activities rather than disaster risk reduction (DRR), because relief provides significant opportunities for financial irregularities, as the cash flows (donor support) are much larger than in normal times (DPIs, PMIs). Mahmud and Prowse (2012) claimed that relief interventions are particularly prone to corruption because of the substantial flow of resources. For example, 98 % of Cyclone Aila affected households received some kind of relief (in cash or in kind) from NGOs and 64 % found irregularities (Mahmud and Prowse 2012).

There are close ties between NGOs and the local communities. The relief irregularities (favouritism, uneven distribution, etc.), lack of transparency, and bribes weaken this relationship and create mistrust, which damage these linking relationships.

4.2.6 Impacts of uneven distribution of relief

The uneven distribution of relief support creates conflicts and fosters dissatisfaction within communities (FGDs, local KIIs). Aldrich (2010, 2011a) argued that uneven distribution of resources would delay post-disaster recovery. A disaster practitioner said in the early phase (immediately after a disaster—up to a week), emergency response organizations provided lower quality, cheaper relief goods, in higher quantities, and distributed these among the

³ US\$ 1 = BDT 77 as of April 2013.

most affected and vulnerable people. In the second phase (from 1 week to a month), comparatively better quality items arrive and are distributed among the moderately vulnerable people. Finally (from a month to several months), the best quality items arrive and are distributed among the less vulnerable people. Due to this relief distribution practice (and because a household will not get the same relief item twice from the same organization), the best relief packages go to the least vulnerable people (comparatively better-off families) and the lowest-quality packages go to the most vulnerable people (the poorest). This practice creates conflict in communities and mistrust between communities and relief provider organizations. Mallick et al. (2009) argued that uneven distribution of relief goods weakens community resilience, increases conflict, and leaves the poor more deprived.

4.2.7 Relief dependency and uncertainty about access to relief

NGOs' practices often foster relief dependency. Citing a case from the Brahmanbaria Tornado 2013, one disaster practitioner stated that the tornado affected households received sufficient building materials and cash. However, the affected people did not build their houses, because they thought more people/organizations would come and give them additional support. This is a common scenario after disasters in Bangladesh. Another disaster practitioner claimed that 'if we could have stopped providing support, the victims would have built their houses within a month after the tornado'. NGO staff (at the NGO workshops) also advised that due to NGOs' massive relief intervention, people often become relief dependent. One NGO official stated that after relief had been provided, if they asked an affected household head, 'what relief goods did you get?', the household head would answer, 'I got nothing or a little bit', because they wanted to get more from other organizations and receive attention and sympathy. Matin and Taher (2001) concluded, resonantly, that people needed longer-term assistance to move away from 'relief-dependency' to more self-reliant development.

Relief dependency can be understood as a logical coping strategy for local people, given the uncertainties of access to relief (DPIs, PMIs). When an affected household is uncertain about current and upcoming relief, and about how long they will continue to receive support for, what they say is often chosen to increase the chance that they will receive additional relief, which will boost their savings and therefore their resilience (FGDs, local KIIs). Equally, affected households often get by through receiving micro-credit from NGOs, loans from moneylenders, or loans from other community-based organizations (e.g. fisher and farmer cooperatives). However, these are expensive ways to cope, compared to receiving relief support. Uncertainties about future access to relief, and the costs of the alternatives, make 'relief dependency' a relatively 'logical' survival response for households.

Households' uncertainties have multiple sources. NGOs cannot be sure that they can continue to provide relief to an affected community. Often they do not know whether they will be able to negotiate successfully with international donors to get further relief (DPIs). Paul (1998b) noted that NGOs are unable to continue their emergency programs if foreign donors withdraw their support or undertake a major cut in donations. Most of the NGOs' programs are short term, issue based, and donor funded. Therefore, despite the community needs of existing projects, NGOs cannot continue (DPIs, PMIs, NGO workshop). Sometimes, for example, they are unable to access relief funds, but are able to assist with rebuilding local infrastructure—so communities as a whole may be benefitting, whilst the suffering of vulnerable households is increasing.

On top of these uncertainties, from a household's perspective, significant additional uncertainties are introduced by NGOs favouring their members, and the effects of corruption on relief distribution, each of which introduces uncertainties from an individual household's perspective. Households also have to contend with the fact that eventually NGOs try to return to normal business, i.e. to providing additional microcredit, rather than providing relief support (which is distributed freely).

A further set of uncertainties relates to capacity to reestablish livelihoods and/or dependence on a single source of income (e.g. simply fishing). Some farmers are adversely affected by the salinization of their land, which reduces its productivity; commonly, this means that only one crop can be produced per annum rather than the usual two or more. Households that depend mostly on fishing are vulnerable in the cyclone season, in particular, and also affected by stock declines caused by overfishing and illegal fishing.

Notwithstanding these uncertainties, coastal households expressed a strong desire for independence. The household heads and focus groups said that they do not want to rely on relief goods (asking for which they referred to as *khoirat* i.e. *begging*) except for the emergency period. Rather, they want to depend on working. Their priority for assistance, beyond the emergency period, was securing existing livelihoods (e.g. fishing and farming) and creating new employment. Many households would welcome assistance to send some family members overseas to earn remittances, for example training in needed skills, and assistance linking with international recruiting agencies.

5 Policy implications

The analysis above leads us to the following policy recommendations. These are designed to strengthen the contributions of NGOs effectively through linking relationships to disaster resilience and recovery in Bangladesh.

5.1 Reduce corruption in relief distribution

Corruption fosters mistrust between NGOs and local people (Rothstein and Eek 2009) so, from a disaster resilience perspective, it should clearly be reduced where possible (as discussed above in Sect. 4.2.5). Trustworthiness builds social capital in social networks (Fu 2004); corruption damages them. For example, after Cyclone Sidr one NGO in the study area demanded bribes during the distribution of livestock, nets, and boats and also put less effort into distributing relief goods than other NGOs. Many borrowers ended their membership of that NGO and built links to other NGOs (FGDs).

In Forester's typology (Forester 1989, p. 34) based on Habermas' theory of communicative action (Habermas 1986), the impact of corruption is systemic but unnecessary: it is widespread (Mahmud and Prowse 2012, Table 3), but steps can be taken to markedly reduce it. Finding systemic *responses* to corruption can add considerably to the effectiveness and efficiency of relief distribution in Bangladesh. These systemic responses are as follows:

Fair distribution of relief goods and community participation in the relief distribution process would reduce mistrust (FGDs, KIIs, DPIs). A participatory development approach (Chambers 1983) could do this. NGOs and households would share information about household needs and availability of relief packages and make decisions jointly about how relief should be distributed, based on households' needs and vulnerability. There are

Bangladeshi examples of this approach being applied in practice. For instance, during the Jessore–Satkhira Flood in 2000, one NGO used a transparent process to select beneficiaries. They called the villagers into an open field and explored their relief packages and criteria for selecting recipients. By doing this, the NGO was able to identify the most vulnerable households. They then hung the list of selected household heads up in a public place and announced that if anybody had any objections to the list, it would again be discussed in an open forum and necessary corrections made. This resulted in successful relief distribution without any complaints (DPIs). Another disaster practitioner cited a post-Sidr case in Madras village in the Bhola district. The NGO workers called the villagers to a meeting and informed them about their limited supply of relief goods and asked them to identify the neediest people. In response, many people withdrew their claims for relief, in favour of needier people. If this process was followed by other NGOs, they would avoid corruption and relief irregularities.

A participatory development approach would need cooperation from the community and local government leaders. A community committee, set up by NGOs, with membership from local government representatives, teachers, imams, volunteers, and affected people, would be used to identify vulnerable people and oversee fair distribution of relief goods. An integrated (InterAcademy Council 2004; Moe and Pathranarakul 2006; Sutanta et al. 2009), multi-organizational (Chen et al. 2008; Raju and Becker 2013) approach is what is needed. Government and NGO collaboration, with communities, could strengthen monitoring, avoid duplication, and reduce corruption in relief works.

Addressing corruption in NGOs could also make a significant contribution to reducing relief dependency. If locally based NGOs made clear commitments to affected households about what support would arrive when, then relief dependency could be reduced (as discussed in Sect. 4.2.7). A fundamental constraint is the uncertainty of cash flows from international NGOs to locally based NGOs, both directly and via the head offices of national NGOs. However, corruption contributes significantly to uncertainty—both directly, and via its impacts on donors’ trust, and the complications to negotiations that this introduces. An effective triangulation between the donors, local NGOs, and the community is needed. Providing a *relief card* to affected households, on which a record is kept of relief that has been provided and is scheduled, would also make a significant contribution to transparency at the local level and thence to equity in provision of relief goods.

5.2 Relief from microcredit obligations

Many households found microfinance arrangements that made recovery difficult and want loan terms that take better account of the effects of disasters on their livelihoods (detail in Sect. 4.2.4). Fifty-six percent of households reported being aware of NGOs that continued to ask for repayments all through the recovery period (including immediately after Cyclone Sidr, and for the initial few months when disruption was high), and most NGOs continued to charge interest throughout this period (Table 3). NGOs that continued to charge the same flat interest rates, but gave their borrowers repayment holidays (for 6 months in some cases), did significantly reduce the effective interest rates paid by households, however (see, Institute of Microfinance 2014 for a guide to the effect of this)). Nonetheless, the impact of microfinance arrangements on households’ capacity to recover was very high.

Clearly, to build resilience, provision of microfinance needs to be better integrated into recovery support. Through creating a separate ‘welfare wing’ in their loan portfolios—loans explicitly managed to support disaster recovery—NGOs could support recovery of badly impacted households (Matin 2002). From a household perspective, having a

complete holiday from loan obligations would be appropriate: payments would resume at the normal rate after the recovery period, no additional interest would be charged, and the time to repay would be extended by the holiday period. Given the costs of providing microfinance (Institute of Microfinance 2014), external donor support would be needed to make this achievable for most NGOs.

5.3 Develop occupation-based support groups in communities

As discussed above (Sect. 4.1), occupation-support groups could be strengthened substantially in ways that would benefit local fishers and farmers, their households, and their communities. Occupational groups could contribute in several ways. *Firstly*, they can function as self-help groups and provide volunteers during disasters and potentially keep recovery projects running after donor funding provided to NGOs and others have ended. *Secondly*, fishers' groups can advocate for changes to moneylenders' financial arrangements with vulnerable borrowers, post-disaster, and provide fishers with information about market prices for fish and alternative sources of loans. *Thirdly*, farmers groups would be in a better position to liaise with local government, NGOs, and Upazila Agriculture Offices to seek options for farmers whose land is salinity affected, and to address other farming specific impacts of cyclones than individual farmers are. *Fourthly*, these groups could help NGOs to assess communities' needs following disasters and help them identify the more vulnerable households and also identify and contact other groups (e.g. cooperatives) or individuals (e.g. political leaders and local philanthropists) who could help with disaster recovery.

NGOs could play key roles in developing these groups. There are many informal fishing groups in coastal communities, for example groups of 6–8 fishers who usually catch fish together (FGDs, Thompson et al. 1998). Group fishing is a common cultural practice in the fishing communities of Bangladesh coast. In the 1990s, an NGO (Coastal Development Centre—CODEC) started working with these informal groups and developed 'saving and loan groups' in fishing communities (Blowfield and Haque 1995). These informal groups, and the experience of CODEC, provide a starting point from which NGOs could work. NGOs could also leverage their experience of creating 'microcredit groups'—groups of households organized by a local group leader—to coordinate microcredit lending to households. For farmers, a model that NGOs could follow is development of 'Farmer (*Chashi*) Clubs'. They were previously popular, but shifts in government and donor priorities have led to a marked reduction in this form of local group. The groups—as is current practice—would be self-managing; the NGOs main contribution would be helping additional groups form. Group members would elect their leaders, and the leaders work in a voluntary capacity, as is also the case with microcredit groups. Other development partners, for example, local government and Upazila Agriculture and Fisheries Departments, could also contribute to these efforts.

The idea of prioritising 'occupational groups' is linked to Putnam's discussion of building local level capacity and strengthening local social capital (Putnam 1993). This is also aligned with both the 'target group' approach (Ahmed et al. 1997) and the 'Community Based Fisheries Management' (CBFM) approach (Rab 2009; Thompson et al. 2003) through which many NGOs have been working in the coastal areas of Bangladesh. Building and strengthening these groups could make a substantial contribution to building community ownership of recovery projects and development projects generally. The groups would need training and technical support. A development partnership approach (among local community, and local, national and foreign NGOs) is required to form and

sustain these groups. There are some challenges putting this approach in place, to sustain capable, larger occupational groups. In particular, the small informal farmer/fishing groups that currently exist are often the groups to whom government and NGO-funded projects deliver their services; they are not related to as development partners (Food and Agriculture Organization 2014).

However, NGOs do have a significant track record of successfully establishing local community groups to take forward projects after funding finishes, in the study region. This suggests that local NGOs have the capacity to establish effective villager groups and that the village communities are capable of working well together in independent groups. For example, a pond sand filter (PSF—a drinking and cooking water source) of Boro Tengra village (adjacent to the study village) was set up by a local NGO. A managing committee was formed through community participation. Before setting up the PSF, the NGO talked to the community and identified the roles and responsibilities of both parties. The NGO provided technical and financial support, and the community selected a place, provided labour, and set the rules for using the PSF. They conducted monthly meetings, collected donations (financial contributions were not mandatory for all users), and addressed maintenance issues. By building community ownership and creating an environment where people felt that the PSF was their resource, the NGOs created a successful project and built local social capital.

Another successful case is the community satellite clinic in Haritana village (also close to a study village). This was also set up by a local NGO and run by a village committee. The NGO provided medical training for two interested villagers. A villager provided a room for the clinic. The community has continued to manage the service, after project funding ended, and accumulated sufficient money to buy land for the clinic. Several successful cases of occupational groups/committees (female, fishing and farming) can be found in the other coastal villages: working on DRR education and climate change adaptation (planting trees to protect from coastal erosion and using bunkers to protect household goods, crop seeds, other valuable resources, and foods, during disasters) (Islam 2010).

These cases are examples of NGOs taking a ‘capability approach’ (Nussbaum 2000; Sen 1999) to development, in which the NGOs’ aim is to empower the community and increase people’s freedom, not simply seeking funding from government and international organizations to provide local services. The key shift is relating to village groups as ‘development partners’. We argue that if the methods of these successful cases were followed in the other communities, to build occupational groups, this would significantly increase community capacity to work successfully in disaster resilience and recovery. Multiple sources of data, for example household surveys, focus groups, and local and national key informants, also support this conclusion. NGOs could also draw on successful development practice from other sectors, for example development of trade union groups in the garment industry.

5.4 Enhance livelihood opportunities

Our wider vision is to build the capacity of local communities to reduce their dependency on relief and increase their own resilience. NGO officials indicated that local people tend to be relief dependent, but it is also clear that local people wish to be independent (see Sect. 4.2.7). Relief distribution alone is not enough to enable people to cope with disaster situations resiliently and to fully recover (Mallick et al. 2005; Parvin and Shaw 2013). Raillon (2010) emphasizes that relief, as such, makes only a limited contribution to

building communities' resilience and that community development is underemphasized by NGOs and others. We recommend that NGOs take an asset-based community development (ABCD) approach (International Association for Community Development 2009; Mathie and Cunningham 2003), identifying and mobilizing communities' resources, and facilitating 'community-driven development' leveraging them.

Better securing existing livelihoods would make a fundamental contribution. Farmers should be assisted to make multiple use of what is currently 'one crop land'. Fishers should be supported by restricting illegal fishing (i.e. fishing during spawning season, and fishing with fine mesh nets that kill juvenile fish, threatening future stocks, and thence future livelihoods). Providing fishers with alternatives to moneylenders (*dadondars*) when fish and nets need to be replaced after disasters would also make a major contribution (see Sect. 4.1). Both government and NGOs could lend money to replace fishing equipment.

Coastal communities also have assets—e.g. skills and land—that could be leveraged to create new income streams. Fish processing and ship recycling industries could be developed in coastal areas, for example (Islam and Walkerden 2014). New tourist destinations could also be developed. Near the study villages, for example, four areas were identified as potential beach tourism places ('Laldiar Char', 'Padma', 'Sluise', and 'Jintola'). Dependence on multiple income sources increases resilience and reduces relief dependency.

In an ABCD approach, communities, government organizations, and NGOs work in close partnership. For locally based NGOs, the key shift would be giving relief work less prominence by increasing their contributions to community preparedness.

6 Conclusion

The main goal of the current study was to explore how the links between households and local NGOs promote disaster resilience and recovery. The findings of this study are intended to be useful to NGOs and governments when developing further policies to enhance linking networks to support disaster resilience and recovery in Bangladesh.

NGOs provide support through emergency relief, livelihood assistance, and shelter providing some building materials to repair damaged houses and new houses for some victims. There are a number of issues with typical NGO practice, however, from a resilience and recovery perspective. These include:

- Most coastal households want better houses, not simply help reconstruction of houses that are highly vulnerable to cyclones.
- Emergency relief support was substantial; livelihood assistance—for example providing nets and boats, cropping seeds, and poultry and livestock—was limited compared to community needs.
- During distribution of relief goods, NGOs usually favour their own microcredit borrowers. NGOs often demanded bribes when they distributed livelihood support such as livestock, nets, and boats. Relief work provides a heightened opportunity for corruption, as the cash and in-kind flows are relatively large after disasters, compared to normal times. The uneven distribution of relief support, and bribery, creates mistrust between NGOs and households, and fosters dissatisfaction among the communities, damaging these linking relationships.
- During the crisis, most NGOs did not stop charging interest on microcredit loans, and some demanded that normal repayments/instalments continue. Microcredit

arrangements impeded recovery of many households significantly; disasters substantially increase their debt burden.

NGOs make important yet flawed contributions to disaster recovery and resilience. The findings suggest that to better address coastal communities' vulnerabilities, NGOs should expand their 'non-aid-centric' activities such as pre-disaster risk reduction through preparedness, notably through enhancing livelihoods and assisting with construction of more robust housing, while continuing their 'aid-centric' activities, in particular relief works, in the recovery phase. Households have a strong preference for empowerment and resilience, rather than relief dependency, and NGOs' approaches should align with that. Their priority should be helping the community 'to walk with their own shoes'. There is no single formula/institutional arrangement for all situations; however, NGOs should play a proactive role in building community capacity and promoting resilience.

This paper has not analysed how disaster victims rely on other linking networks, for example, with local government and other community-based organizations; further research on these relationships is needed. Another research opportunity is to explore how NGOs could make emergency relief goods available to affected communities more quickly, and how local households could safely store more food prior to the arrival of cyclones, as communities would value this highly; there are a range of logistical and financial challenges to be considered, however.

This study contributes to a growing body of literature on social networks and disaster resilience by exploring the relationships between households and NGOs in coastal Bangladesh. It identifies a range of strengths and weaknesses in these linking relationships and identifies options to enhance NGOs' contributions to disaster resilience and recovery.

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Chapter 5- Paper 4: How local governments support households to recover from cyclones in coastal Bangladesh: an investigation of local social capital

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This chapter is designed based on a type of households' linking social networks. The discussion in this paper is centered on answering the key research questions, when local government (Union Parishad—UP) as a linking social networks perform strongly and poorly in disaster resilience and recovery, and how can local governments' capacities be developed for effectively contribute to disaster resilience and recovery.

This chapter describes UPs' well support for example emergency relief, shelter, and livelihood assistance after a disaster. It also explores UPs' poor performance for example favouritism and corruption during distribution of emergency relief and other recovery support after a cyclone. These are the key contribution of this chapter through which it is identified how a linking social capital like local government is involved with unfair activities during distribution of recovery support following a disaster. This malpractice (e.g. favouritism and corruption) affects the trustworthy relationships between the households, and between households and Union Parishad leaders. Due to this malpractice and a lack of decentralization of power, the Union Disaster Management Committee (UDMC) is transformed into an inactive body. This chapter identifies the factors contributing to UP's weak performance, which negatively impact on the recovery process. It also explores that the UP representatives use the village political leaders and village headmen for their vote politics. Instead, the village leaders often take an opportunity to involve with corruption as UP leaders are dependent on them for votes during an election. Finally, this chapter identifies possible options for strengthening UPs' post-disaster recovery activities.

Abstract

Households' links with local government provide important support for disaster resilience and recovery on the Bangladesh coast. By using mixed methods approach, this study examines instances when Union Parishad (UP—the lowest tier of local government, a crucial embodiment of linking social capital) has performed well and poorly in disaster resilience and recovery, using two coastal villages affected by Cyclone Sidr as case studies. The findings show that UP provides important support, for example relief distribution, livelihood assistance, and reconstruction of major community services. However, while providing this support, UP representatives sometimes act corruptly, favouring members of their own political group, and taking bribes. Such malpractice fosters inequality and discontent, and mistrust between local households and UP leaders. We argue that UP should place more emphasis on disaster risk reduction to build community capacity – not simply disaster relief– and rebuild trust through fair distribution of relief goods. To support this, the national government should allocate a regular budget to UP to strengthen local capacity for disaster resilience and recovery.

Keywords: Social capital, Disaster resilience and recovery, Local government, Union Parishad, Cyclone Sidr, Bangladesh coast.

5.1. Introduction

Bangladesh is highly vulnerable to natural hazards due to its flat topography, number of large rivers, location in the cyclone zone, and climate change (Dasgupta et al., 2014, Disaster Management Bureau, 2010a, Mahmud and Prowse, 2012). Coastal areas of Bangladesh experience frequent, severe cyclones, bringing wind damage, storm surges, flooding, and saline intrusion (Disaster Management Bureau, 2010a, Rotberg, 2010, Paul et al., 2012). These hazards, as a whole, create socioeconomic and ecological vulnerabilities, and the relative poverty of coastal inhabitants worsens the vulnerability of these communities to such disasters (Alam and Rahman, 2014). To address these vulnerabilities, local people use various networking relationships; local social capital resources and networks are a vital contributor to community resilience and recovery from disasters (Minamoto, 2010, Hawkins and Maurer, 2010, Aldrich, 2010b, LaLone, 2012). Aldrich (2010a) shows social capital plays a pivotal role in recovery, and specifically that

local initiatives and interventions play a key role. Islam and Walkerden (2014) found that immediately after a disaster, affected households depend on *bonding networks* (relationships with immediate family members and relatives) and *bridging networks* (relationships with neighbours and friends) to cope with crises, because organisations that provide support take at least a few days to reach the affected area. The capacity of these bonding and bridging relationships is limited by the households' physical and financial capital, the strengths and weaknesses of these horizontal relationships, and the magnitude of the disaster. For longer-term recovery, disaster victims usually need support through *linking social networks*, for example, from local government, NGOs, and other community-based organisations (CBOs).

Social capital substantially facilitates disaster recovery for affected households. Isolated households with small social networks are especially vulnerable to disaster, and they receive less organisational support and experience a slower pace of recovery than households with strong social networks (Tse et al., 2013). Despite the significant role of social networks, their contributions to disaster resilience and recovery are often overlooked by development professionals and policymakers (LaLone, 2012, & Disaster Practitioner Interviews-DPIs). This paper discusses the supporting role of Union Parishad (UP), the most local form of local Government in Bangladesh (the two layers above it, Upazilla Parishad and District Parishad, are also relatively local forms of local Government), and documents the process by which UP contributed during the Cyclone Sidr¹⁹ recovery process.

5.2. Literature review

Concepts of social capital have had extensive development for use in analysis of social life. Social capital implies the social relationships, norms and structures, trust, ties, and networking among people in a society which brings benefit to both individuals and society (Hishida and Shaw, 2014, Zhao, 2009). The definition of social capital used in this study

¹⁹ Sidr, a category 4 cyclone, hit the Bangladesh coast on 15 November 2007; caused damage and loss of about 1.6 billion US dollars, and human casualties were 3,406. More than 55,000 were injured and about 9 million people were affected, while over 1,000 remain missing. Most of the Sidr affected people either lost their dwellings or sustained significant damages to their homes, livelihoods, livestock and environment Economic Relations Division 2008. Cyclone Sidr in Bangladesh: Damage, Loss and Needs Assessment for Disaster Recovery and Reconstruction. Dhaka: Ministry of Finance, Government of the People's Republic of Bangladesh.

is derived from that given by Bourdieu (1986), Coleman (1990), and Putnam (1995). Bourdieu (1986a, p. 251)) understands social capital as an “actual or potential” resource to which individuals have access by becoming members of networks. Coleman (1990) focused on obligations, information sharing, norms, and social networks as expressions of social capital. Our emphasis is, in Putnam’s (Putnam, 1995, p. 67) terms, on “features of social organization [...] that facilitate coordination and cooperation for mutual benefit”.

Social networks are a crucial embodiment of social capital. Social networks are relationships that develop between individuals and/or groups through organisational life and other types of social connection (Carpenter, 2013). These networks can be differentiated based on the kinds of social connections between people, into bonding networks (with family members), bridging networks (with neighbours and friends), and linking networks (with organisations) (Woolcock, 2001). We focus on households’ relationships with a local Government unit (Union Parishad), an important linking network for households in disaster resilience and recovery. Linking social network is the extent of the relationships that individuals build with institutions that provide access to services, jobs or resources (Woolcock, 2001, Storr and Haeffele-Balch, 2012).

The literature on how social capital influences disaster recovery has relatively little discussion of on the contributions of local Government (e.g., Smith and Boruff, 2011, Hawkins and Maurer, 2010, Storr and Haeffele-Balch, 2012, Minamoto, 2010, Aldrich, 2011b, Aldrich, 2010a, Zhao, 2009). Most of the social capital and disaster studies have discussed bonding, bridging and linking networks together rather than differentiating them.

Some disaster management studies discuss local Governments’ involvement in the disaster management process. For example Wolensky and Wolensky (1990), Bajracharya et al. (2011), Ainuddin et al. (2013) discuss local Government’s roles in implementing local- and national-level emergency management policies, plans and disaster risk reduction strategies. King (2008) and Chamlee-Wright and Storr (2011) discuss how local Government takes responsibility for safeguarding the communities and contribute to rebuilding activities after a disaster. Raju and Van Niekerk (2013) and Raju and Becker (2013) discuss how local Government sometimes helps to coordinate the multiple organisations involved in the recovery phase (both in relief distribution and in rebuilding

activities) following a disaster. Jones et al. (2013) found that Community-Based Disaster Risk Reduction (CBDRR) activities are more successful in Nepal, where they are institutionally embedded in local Government structures. In Bangladesh, local Government contributes to relief and rehabilitation after a disaster (Haque, 1997); UP is engaged with a larger number of functions and responsibilities than the layers of local Government above it (Ikeda, 2009). However, the literature on the role of local Government in disaster recovery is relatively limited, and there is, to our knowledge, none specifically on the role of local Government in Bangladesh.

The UP is an important medium through which households are linked to recovery resources from outside the affected area after a disaster. The elected body of UP comprises a Chairman and 12 Members, one for each of nine Wards²⁰, and three women members each representing three Wards, who are also elected through direct vote. The administrative staff comprises a UP Secretary and *Dafadar* (village police), and nine *Chowkidars* (village watchmen) (Asian Development Bank, 2004).

This study contributes to the literature on local government's roles in disaster recovery, and makes an initial contribution to the discussion of its role in Bangladesh specifically. It also links the discussion of local government's contributions to the broader discussion of the role of social capital in recovery processes. It examines when UP performs well and poorly in disaster resilience and recovery; what factors are responsible for weak performance; and the opportunities for increasing the UP's capacity to actively contribute to disaster resilience and recovery. It addresses these research questions by a micro-level investigation of how the relationships between households and UP promote disaster recovery, using as case studies two villages affected by devastating Cyclone Sidr.

5.3. Methods

5.3.1 Study area

This study was conducted in South Charduani and Tatalbaria villages of Charduani Union (the smallest local Government unit), Pathorghata Upazila (sub-district) of Barguna district between February and July 2013. The villages are situated on the Southern coast of Bangladesh, on the banks of the Baleswar River – a channel of the Bay of Bengal

²⁰ A Ward is an electoral unit of a City/Municipal Corporation, and a Union Parishad is created for the purpose of providing more direct representation, from which a single Council/Ward Member is elected.

(Fig.5.1) – where a significant number of households exist close to and/or outside the protection of the embankments. Study villages were selected purposively based on earlier studies which indicated that the coastal villages are susceptible to multiple hazards (Paul and Routray, 2013). The study villages were selected for several reasons:

- (a) They are located within a high cyclone risk zone (Fig.5.2), and are highly prone to cyclones and storm surges. Six major cyclones – Sidr 2007; Reshmi 2008; Nisha 2008; Bijli 2009; Aila 2009; and Mahasen 2013 – hit this area (and our study villages in particular) in the seven years from 2007 to 2013 (Bangladesh Meteorological Department, 2013).
- (b) Cyclone Sidr severely affected these villages, causing 344 deaths of inhabitants, which was 4% of the total population of the villages; about 90% of houses in these villages were destroyed (Multi Task, 2009).
- (c) Consequently, the villagers' responses to Cyclone Sidr reveal aspects of resilience and recovery in extreme circumstances, which we expected to be useful for developing cyclone disaster management policies for the Bangladesh coast. Cyclones and related storm surges have many subsidiary effects in these areas, including flooding, saline intrusion into agricultural land, and erosion (Alam and Rahman, 2014).

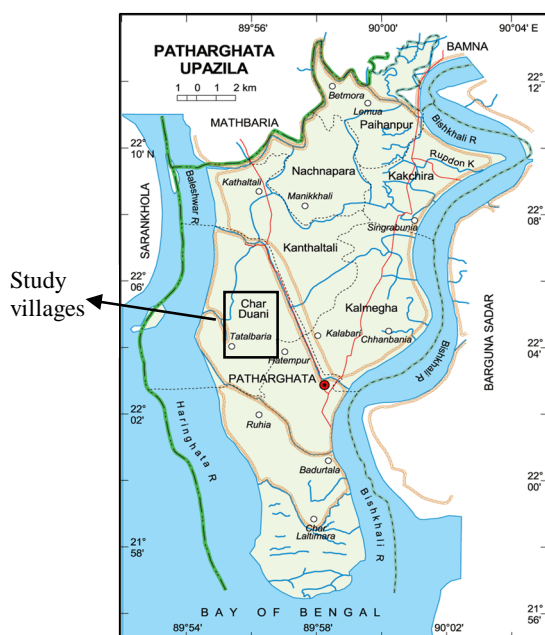


Figure 5.1 Study villages.
Source: Banglapedia, 2006

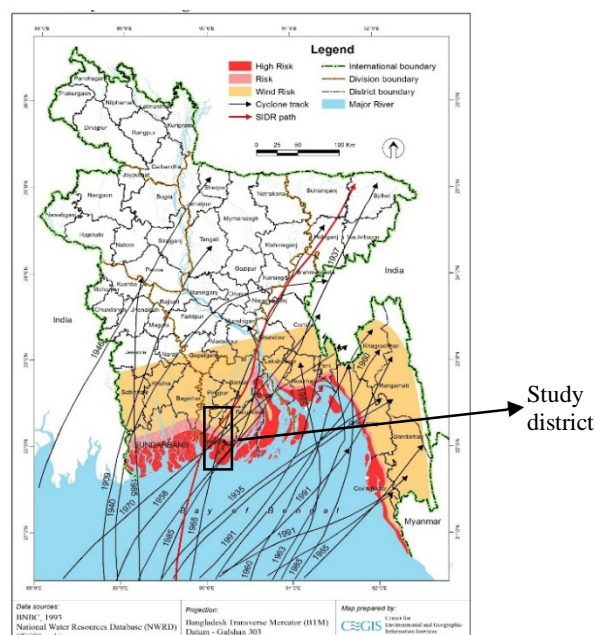


Figure 5.2 Cyclone tracks.
Source: CEGIS, 2008.

5.3.2 Study approach

A mixed method approach, using both quantitative and qualitative data from various data sources, was employed to investigate how Bangladeshi coastal households used their linking networks in their recovery process. Using mixed methods facilitates data triangulation (Creswell and Clark, 2007). Numerical data was used to identify broad patterns in social life - specifically in matters relevant to recovery processes - in the study villages. Qualitative data was analysed to develop richer descriptions of local perspectives, for example, regarding trust, peoples' experiences with cyclones, their needs, and other resources that households used for post-disaster recovery and resilience (Chamlee-Wright and Storr, 2011).

5.3.3 Sampling

The study used a combination of random and purposive sampling (Chamlee-Wright and Storr, 2011). The study villages were selected purposively: we identified a disaster-affected coastal district, then an *Upazila*, a Union, and finally, two villages, ensuring that the study villages were typical in the region, and had been substantially impacted by Cyclone Sidr. We interviewed 159 randomly selected household heads, and obtained valid responses from 156 (74 from South Charduan, and 82 from Tatalbaria), sufficient for 93% confidence that the percentages observed in our sample are within 7% of those typical of households in the villages (Yamane, 1973). (A 95% confidence interval would have doubled the level of fieldwork required, and 93% confidence was considered to be sufficient to inform policy development, given that our approach hinges on triangulating multiple lines of evidence).

5.3.4 Data sources and data collection tools

The first author and two research assistants were directly involved in conducting face-to-face interviews of household-heads using a structured questionnaire with 43 closed- and open-ended questions. Four in-depth case studies were conducted to understand individuals' experiences in recovering from Cyclone Sidr. Semi-structured checklists were used to guide conversations in a number of settings. Eight Focus Group Discussions (FGDs) with the villagers were conducted to explore how affected households perceived

the threats of cyclones, faced the recovery challenges, and benefited from the involvement of UP. Thirty-seven Key Informant Interviews (KIIs) took place with local leaders, local government officials, and village headmen, and workshops were held to discuss issues with journalists, local Government staff (*chowkidars* – village watchmen), and NGO officials. Interviews were also conducted with five policymakers (executives of ministries and departments – Policy Maker Interviews (PMIs)), and 14 disaster practitioners (national and international NGO officials and freelance researchers – Disaster Practitioner Interviews (DPIs)) to explore the outlooks of national-level disaster experts. The participants in case studies, FGDs, local KIIs, and PMIs were selected purposively, and a snowball sampling technique was followed to identify the participants for DPIs. Notes were taken during interviews, workshops and other group processes. In addition, field observations were used to assist with understanding the physical settings and everyday practices of village life (Pouliotte et al., 2009). During the interview sessions, questions were asked about the effectiveness of UP initiatives in rebuilding the community and returning it to “normal” after Cyclone Sidr, and how UPs' capacities could be strengthened to effectively contribute to disaster resilience and recovery.

5.3.5 Data analysis

The quantitative data were analysed with Statistical Package for Social Sciences (SPSS) which provided descriptive statistics, for example, frequency distributions, percentages and tables (Paul and Routray, 2013, George, 2008). Qualitative data were analysed by coding and grouping to identify key themes (Schutt, 2011, Islam and Walkerden, 2014). Qualitative and quantitative data were considered together, to increase confidence in interpretations, and to provide a combination of breadth and depth.

5.3.6 Ethical considerations

All study protocols were approved by Macquarie University's Human Research Ethics Committee (reference number 5201200877), and were designed to minimise risks from disclosure of views about corruption. The researchers only raised questions about possible corruption in private/individual discussions (e.g., household survey and key informant interviews). When corruption was raised in focus groups and people started to point out

individuals, the first author and research assistants intervened and said the focus groups were not an appropriate medium for that conversation. Sources of views on corruption are not identified personally, to protect their anonymity.

5.4. Performance of UP in disaster recovery

5.4.1 Post-Sidr support of UP

UP supported through emergency relief, which was the greatest mode of support after Sidr. Ninety-four percent of household-heads reported that UP provided relief goods (Table 1) - rice, pulses, cooking oil, puffed rice, water, medicine, etc. The UP also supported the communities through providing cash and building materials for use repairing partially damaged houses (Table 1, FGDs, & Local KIIs). FGDs and DPIs mentioned that UP also provided new houses for fully destroyed households, which were mostly the donation of foreign states.

Restoring livelihoods is an important form of support after disasters. UP played a much smaller role in this area. Only 12% of household-heads were aware that UP made contributions to livelihood support, by, for example, distributing crop seeds and fishing nets, and funding repairs for fishing boats (Table 5.1). FGDs reported that NGOs provided much higher support for re-establishing livelihoods than UP.

Despite reconstruction after disasters being a responsibility of local Government under the central Annual Development Programs, limited contributions to reconstruction from UP was evident after Sidr. FGDs and local KIIs advised that the reconstruction works were mostly done by the NGOs, and that they had sought help from international organisations. During field observations, billboards of national and international NGOs (e.g. BRAC, USAID, Save the Children, and South Asia Partnership-Bangladesh) were seen at many road and culvert reconstruction sites. Only twenty-six percent of household-heads were aware that UP was involved with reconstruction of roads and culverts (Table 5.1).

Table 5.1 Types of UP support after Sidr

Support	Percent
Relief distribution	94
Providing cash and building materials for repairing shelter	79
Regain water and sanitation	47
Provide recovery-related information	30
Reconstruction works	26
Search and rescue	15
Livelihood support through cropping seeds, & nets, repair costs for boats	12

Number of cases 156. Multiple responses. Source: Household survey, 2013.

Post-disaster reconstruction is one of the sectors experiencing major corruption, and the UP representatives usually take this sector as an opportunity to mishandle funds, as cash flows are relatively large here after disasters (Mahmud and Prowse, 2012, Table 2, FGDs, DPIs, the NGO workshops, & meeting with journalists). Focus groups claimed, for example, that UP did so-called reconstruction works by placing mud on damaged roads under the national government's "Cash for Works" program, with most of the money being pocketed. The UP representatives said that the Government allocation of funds to UP was small in the light of the damage that Sidr caused. Consequently, it was not possible for UP to reconstruct many damaged roads and culverts. Reconstruction of embankments was not included in UP's activities, as these are maintained by the Water Development Board (WDB). However, the local people were keen to see UP involved in reconstructing embankments. They recommended reconstruction of embankments should occur through a collaboration amongst UP, WDB, and NGOs, as embankments make a critical contribution to disaster resilience, and if these organisations pooled their funds, more reliable embankments could be built.

In addition, UP made a limited contribution to search and rescue immediately after the disaster (only 15% of households identified contributions in this area). This is not surprising, given that local UP employees are, in most cases, victims in disasters as large as Cyclone Sidr, and connections with regional offices of UP are disrupted initially (with damage to roads, telecommunications infrastructure, etc.). They are also partly constrained by logistical issues, for example, a lack, at the village level, of axes, saws, etc. for use in clearing fallen trees off roads to enable search and rescue operations to proceed.

Overall, this study found that UP post-disaster recovery works were relief-centered. Long-term recovery activities – for example, reinstating livelihoods, DRR education, prevention, preparedness, and employment creation – were given less priority by UP. These are, however, essential for community resilience.

5.4.2 Favouritism and uneven distribution of relief and other recovery support

After Sidr, UP representatives favoured their political partymen (political party members and other supporters), and their family, relatives and friends, during distribution of relief goods and other recovery support, for example, distribution of building materials, cash, cropping seeds, *Jatka*²¹ rice, and VGF²² (Vulnerable Group Feeding) cards (Household survey, FGDs, KIIs). Focus groups reported that due to favouritism, many non-farming households received cropping seeds as a post-disaster livelihood support, depriving some farming households of the opportunity to rebuild their farms. One household-head claimed that “some people got such quantity of relief goods, they did not need to buy anything for a long time after Sidr, while some people received very little”.

Political favouritism was high during relief distribution. The personal political interests of middlemen, village political leaders, and village headmen, and party politics, led UP representatives to favour their political partymen. The UP representatives are highly involved with party politics, therefore, they cannot avoid the demands of partymen, because the partymen work hard to win them votes in the election. One household-head claimed that “I did not get all of the relief items that UP was distributing, as my political ideology was different from the current Chairman”. Another household-head said that “the existing Chairman does not like me, as I am a supporter of the ex-Chairman – his competitor. Therefore, I received very little relief goods”. A post-Sidr report from a daily newspaper also found evidence of UP representatives’ favouritism and political bias in relief operations. It reported that UP representatives gave priority to their own supporters in preparing lists of affected people for relief distribution (New Age, 2007b). Mallick et

²¹ *Jatka* is the younger size of *Hilsha* (national fish of Bangladesh). *Jatka* rice is an incentive of the Bangladesh Government. In order to ban *jatka* fishing, the local government distributes monthly 30 kg of rice (locally known as *jatka chal*) as an incentive to the fishermen during *Magh-Asar* (mid-February to late June).

²² VGF is a social safety-net program of the Bangladesh Government. It is an emergency aid during and after disasters. This program currently provides food subsidy (rice) to the poorest in the community.

al. (2009) found misappropriation of UP's relief works after Sidr, and argued that this misappropriation weakens community resilience, increases conflicts, and deprives the poor. Thus, mistrust has been created between the local people and UP representatives. Accusing the village headmen, FGDs reported that when relief supplies came to the UP office, the UP representatives usually informed the village-headmen and village political leaders. The village leaders rarely informed the common people about available relief; rather they distributed relief among their partymen, friends and relatives. Eighty-four percent of household-heads said that because of favouring the partymen, UP representatives failed to perform well after Sidr (Household survey).

UP Chairmen also often favour their own village to provide recovery support after disaster. A case of favouring own villagers was found regarding infrastructure rebuilding after Sidr. For example, the UP Chairman built more *abashon* (government-funded community housing for the destitute) in his own village (Tafalbaria) than according to the needs of the South Charduani villagers (FGDs).

Jatka rice is supposed to be distributed only to fishers, and they are to be identified by checking whether a household has nets and boats. But non-fishing people received some of this support, not fishermen. One local key informant said that "real fishers did not receive *jatka* rice – those who received it, their primary occupation was not fishing". One household-head commented that "the UP Member did not give us a VGF card and even pocketed the *jatka* rice". FGDs reported that if they visited the UP representatives' homes, they could get full cartons of relief goods.

As is commonly the case in Bangladesh (Khan, 1991), the UP Chairman often favoured his own villagers to provide recovery support. The villagers of South Charduani claimed that the Chairman distributed more support in his own village, Tafalbaria, than to them. They saw that most of the affected households of Tafalbaria received new houses, whereas many of those affected in South Charduani did not (FGDs). These incidences of favouritism weakened the UP's disaster recovery contribution. Ninety-three percent of household-heads said that due to this favouritism, UP representatives do not play a neutral role during recovery (Household survey).

In addition, households' geographical location was also a factor that caused unequal relief distribution. Focus Groups reported that some in remote locations did not get necessary relief support, whilst households in good locations did. One household-head reported that "the relief-provider organisations including UP could not come to my place, because my house is situated in a corner of the village, and there is no road to follow. The households living on nearby roads got more relief than me". A daily newspaper reported that people who were passing days half-fed or without food in the remotest areas were largely being ignored, as most of the organisations were distributing relief goods among the people at places accessible to them (New Age, 2007b). Many survivors suffered a lot due to this disparity in distribution.

5.4.3 Corruption during relief distribution

UP representatives often received bribes during distribution of recovery support. Most of the national government's recovery support is distributed through UP. Ninety-two percent of household-heads reported corruption in relief goods distribution; 72% reported corruption in cash distribution (Table 5.2). Eighty-five percent of household-heads identified that some UP representatives were corrupt (Table 5.2). One disaster practitioner claimed that after Cyclone Aila, a UP Member deposited Tk. 1500,000 (US\$19,480)²³ in the bank. This is a large amount in the context of rural Bangladesh. FGDs reported that due to involvement with post-Sidr corruption an ex-UP Member of South Charduaní could not contest the last election. The UP also distributed cash as a Government donation for repairing damaged houses. The households with fully and partially damaged houses received Tk. 5,000 (US\$65) and 2,500 (US\$33) respectively. During surveys, many complaints were noted about unfair distribution of those amounts. Many households reported that had to provide bribes to UP members and their cadres in order to receive that money. One household-head claimed that "sometimes the UP Members kept half of the total allocated amount". Another household-head reported that "my house was destroyed, but I did not receive any cash, because I could not provide any bribe to the UP Member". One local key informant claimed that he gave Tk. 5,000 as a bribe to a UP Member for a new house (locally known as *Saudi House* – a donation from the Saudi Government, approximate cost of Tk. 25,000, US\$325), but did not receive the house. He finally got the money back, however many people did not. Similarly some affected households had to

²³ US\$1 = BDT 77 as of April 2013.

provide bribes to receive building materials. For example one household-head said that “providing a bribe, I received two bundles of tin (corrugated iron sheet) because my house was destroyed”. Asian Development Bank (2004) found that the resource distribution through UP is less transparent, elite (UP representatives, and local political leaders) biased, and corrupt, which support our findings.

Significant number of household-heads identified many village-headmen and village political leaders, who work as the local political agents of UP representatives, as corrupt (Table 5.2). In fact, UP representatives are highly dependent on the village headmen and village political leaders for votes during the election, because the local leaders are the key individuals that influence voters. Consequently, UP representatives do not prepare relief distribution lists alone – they usually select the affected households together with the village-headmen and village political leaders. As a result, household-heads keep close to the village-headmen and village political leaders. Village leaders sometimes take advantage of this influence, and demand bribes for putting local peoples’ names on the distribution list, which disrupts the fair distribution of recovery support. One household-head commented “the corrupted persons are the village leaders, who usually prepare the relief distribution list of the affected households”.

Table 5.2 Post-Sidr corruption perceived by household-heads

Corrupted sectors	Percent	Corrupted individuals	Percent
Relief distribution	92	UP representatives	85
Cash for repair damaged house & fishing boats	72	Village headmen	76
Repairing damaged shelters	67	Local political leaders	75
Fishing nets distribution	49	NGO workers	60
Cropping seeds & fertilizer distribution	38	Local Government employees	10
Reconstruction works	29	UDMC members	8

Note: Number of cases 156. Multiple responses. Source: Household survey, 2013.

Another expression of corruption is substitution of lower quality goods for higher quality goods provided by international relief organisations, and distribution of only a proportion of relief goods received. For example, some household-heads reported that out of every 30 kg of VGF rice, 20 kg were rotten. What sometimes occurs is that parties responsible for relief distribution purchase supplies for distribution locally, whilst keeping the rice (or other goods) provided by relief agencies. Another household-head said that “UP distributed only 10–15 kg rice per household, while the allocated amount was 30 kg”. Another variation is irregularities in the length of relief support. FGDs reported that one

VGF cardholder household is supposed to receive support for up to two years, however, after receiving bribes, some UP Members extended some beneficiaries' tenure illegally. Relatedly, sometimes UP members recruited new supporters by giving benefits intended for vulnerable households to new households. Local journalists also confirmed these conclusions about relief irregularities.

Although the presence of corruption is widely recognized, a few disaster practitioners suggest that it is a significantly smaller problem than our analysis has concluded. For example, one disaster practitioner said that people sometimes exaggerate corruption. He claimed that UP-level corruption is at a minimum. He also added that if we distribute all relief goods through UP with strong monitoring, there might be a very negligible level of corruption. He reported that "we worked through a UP after Sidr and did not see any irregularities, due to strong monitoring". However, UP representatives are aware of corruption, and aware of its influence on voting - in particular, not being corrupt can be difficult, because some villagers commit their votes based on whether they are able, via bribes, to get preferential access to relief goods and cash. Notwithstanding the dissenting comments, many lines of evidence - from each of FGDs, household surveys, local KIIs, and local journalists - confirm that UP representatives are involved in post-disaster corruption.

The volume of corruption after disasters is higher than in normal periods, simply because there are large flows of cash and relief goods into the affected areas. Similarly, Mahmud and Prowse (2012) found that post-disaster relief interventions are particularly prone to corruption because the flow of resources is rapid and substantial. These large money and relief flows encourage the UP and village leaders to act corruptly. However, this creates mistrust between the local people and UP leaders, i.e. these key linking relationships are damaged. From a disaster recovery perspective, this distrust is very concerning, because collective decision-making is important during the recovery process. Communities with more trust and stronger networks with local authorities can better bounce back after a crisis than fragmented and isolated communities.

5.4.4 Role of Union Disaster Management Committee (UDMC): an essential body of UP

The UDMC²⁴ is formally responsible for local-level disaster management. UDMCs are set up by Union Parishad, as part of national arrangements for disaster management. The Standing Orders on Disaster (SOD—issues by the national Government) give an active coordination role to the UDMC – it states that as part of disaster responsibilities, the UDMC shall meet once a month during normal times; at the warning and pre-disaster phase, each committee shall meet more than once a week; and during the disaster, shall meet as and when needed, even daily. In the recovery phase, committees are directed to meet once a week (Disaster Management Bureau, 2010b).

In our study areas the UDMC was not carrying out that coordination role effectively. One of UDMC's mandated roles is to provide pre-disaster awareness programs, and another is to coordinate relief works (Disaster Management Bureau, 2010b; see, SOD). Yet in our study area seventy-five percent of household-heads did not know that the UDMC existed as a Union Parishad body (Household survey). Most of the household-heads had not seen or heard of UDMC activity in their area (Household survey, FGDs). Our interviews with disaster practitioners, and other research, indicate that this is the usual case in Bangladesh. During normal times, many UDMCs meet less often than once every two months, and some meet less often than once every six months; some also make no contribution at all to disaster preparedness (DPIs). In a study of similar region, Patuakhali, it was found that the UDMC made little contribution to disaster response coordination, and that most engagement by UDMC members was motivated by the opportunities to influence distribution of relief favorably for themselves and their networks (Islam, 2010). In a recent study, Khan (2013) similarly found performance of the UDMC to be “weak” at all phases of disaster management, for example, prevention, preparedness, response, and recovery.

²⁴ The UDMC consists of the UP Chairman as the chairperson and members comprising all the government department heads at Union level, Members of UP, representatives of women, peasants, and fishermen and freedom fighters, NGO officials working in respective Unions and local civil society members Disaster Management Bureau 2010b. Standing Orders on Disaster. Dhaka: Ministry of Food and Disaster Management, Disaster Management and Relief Division, Government of the People's Republic of Bangladesh..

5.5. Factors contributing to UP's weak performance

5.5.1 Political factors

Political factors played a key role in UP's poor performance. Fifty-five percent of household-heads identified abuse of political power and exchange of bribes as causes of UP's inappropriate performance (Table 5.3), and 33% of household-heads thought that conflict among the villagers was a cause of UP's weak performance (Table 5.3).

The political needs of leaders played a central role in the inequities and corruption in disaster relief. Politicians depend upon villagers' votes, and so many tend to distribute emergency relief and other recovery support in ways that reward their political supporters. One disaster practitioner commented, for example, that "UP representatives have political accountability at the local level. They cannot make the relief distribution list very objectively always, as their political priority is voters." FGDs, DPIs and local KIIs described how UP representatives were, at times, unable to agree on how relief goods should be distributed, with the outcome being that supporters of the political majority were favoured. A second consideration for some politicians is the financial strain of electioneering. This study encountered an 'open secret': some UP representatives had spent money as an 'investment' before an election to gain political power, and used relief and rebuilding activities as an opportunity to recover that money and also to save for the next election (DPIs, local KIIs).

Table 5.3 Responsible factors for weak performance of UP

Factors		Percent
Political	Abuse of political power	55
	Conflict among the villagers due to different political ideologies	33
Communication	Lack of communication with the local people	28
	Lack of willingness	25
	Unavailability of UP representatives during emergencies	18
Ethical	Bribery	55
Economic	Lack of financial capacity	7

Note: Number of cases 156. Multiple responses. Source: Household survey, 2013.

From a social capital perspective, one way to understand this favouritism and corruption is as politicians taking steps to build their social capital (through favouring partymen and buying voters) - but a form of social capital - "uncivil social capital" (Pérez-Díaz, 2002,

Callahan, 2005) - that tends to undermine the development of broader 'civil society' (Putnam, 1995). For the purposes of this study, with its focus on relatively local social capital in Bangladesh - at the resolution of a Union Parishad (UP) - we differentiate "civil" from "uncivil" social capital on the basis of whether the form of social capital being built supports development of civil society (through social connectedness and civic engagement based on equity and trust) (Putnam, 1995) at the Union Parishad level. From this perspective, politicians building networks of support through favouritism, and through taking bribes for relief provision (n.b. that there is a certain mutuality in this, from many households' perspectives), are building "uncivil social capital": social capital that supports them and their party, and undermines the community as a whole. Relief distribution that is managed with integrity and equity, on the other hand, would be building "civil social capital". We identified instances of civilly building social capital (in this sense) through relief distribution in some other regions, but not in our study area. In these villages, at this time, patronage relationships were dominant.

The 'incivility' of local dependence on patronage relationships is obvious at the local level. A consequence of political leaders favouring their own party's people (which happened much more during recovery support - during the emergency relief phase when people were very vulnerable, the consequences of favouritism are higher), was conflict amongst villagers (FGDs). This conflict at village level, between people of different political ideologies, further hindered the equal distribution of recovery support (DPIs, local KIIs). When 'relatively local' social capital is built in a way that undermines broader civil society, it tends to slow down economic growth and social development (Svendsen, 2003). Putnam (2000) refers to this as "dark side" of social capital, which promotes 'unsocial capital' through doing "public bads" and "public goods" (Levi, 1996).

These weaknesses are expressed institutionally. For example, UDMCs' internal organisation is weak, and their activities highly politicised. A local key informant said that "the UDMC members don't have any power. The Chairman is all in all, his decision is final, and the other members work at the will of the Chairman". A disaster practitioner commented, resonantly, that "most of the UDMC members don't know about their membership. Often the Chairman decides who is a member of the UDMC, chooses his party supporters, does not involve them in UDMC activities, and simply makes the UDMC's decisions himself". Speaking about UDMCs in general, another disaster

practitioner said that UP's major recovery activities are run through the Chairmen and their partymen; involvement of formal UDMC members is limited.

Finally, Cyclone Sidr occurred during a period in which a Caretaker Government, supported by the military, was ruling Bangladesh. During this period, many national and local political leaders, including UP representatives, were sent to jail, or fled, after being accused of corruption (often legitimately, and sometimes as political harassment). Consequently, some UP representatives were simply unable to contribute to disaster relief and recovery efforts.

5.5.2 Lack of communication between UP representatives and community

Regular communication is important for linking social networks. This study found a communication gap between UP representatives and the community. Twenty-eight percent of household-heads have identified irregular communication between community people and UP representatives as an important factor in delaying post-disaster recovery works. Most UP representatives have two houses – one in the village and one in a peri-urban area, and they live for most of the time in their peri-urban house. For example, the UP Chairman of Charduani lives in Khalifarhat, a peri-urban area, though his village home is in Tafalbaria, and the UP Member of South Charduani Ward lives in Charduani Bazar. They quite often visit their own constituencies and have contact with the people (FGDs). The Member said that “during the rainy season, I live in the peri-urban area due to the rough roads. But in the dry season, I mostly live at the village home.” In the wet season, although people can communicate with them with mobile phones, or, at a cost, travel to their peri-urban homes to meet them, the villagers do not have good access to their UP representatives during emergencies (FGDs, local KIIs and NGO workshops). In general, the villagers *expect* access to their political representatives during periods of high need after disasters, so from their perspective their political representatives are not keeping faith with the norms of political representation.

5.5.3 Lack of financial and logistic support

Weak financial capacity is a prime factor contributing to UP's poor performance. There is no national Government budget allocation to UP to enable it to maintain its regular activities, and it is also difficult to collect tax from poor villagers (Meeting with UP staff). Problems with revenue collection undermine UP's capacity to provide services of all kinds (Asian Development Bank, 2004). An example of this, which illustrates the problems this causes for disaster resilience, is issues with the salaries of *chowkidars* who provide crucial early warning services, and run disaster preparedness programs. *Chowkidars* are notionally employed full-time, however their monthly salary is only Tk. 1,900 (US\$ 27), about one fourth of average income (about Tk. 8000) in the villages (Household survey). Moreover, payment of their salaries is not reliable, due to the income difficulties experienced by UP. As a result, they undertake considerable casual work in order to support their families. This undermines the quality of their work.

The financial difficulties also impact the *chowkidars'* operational activities. The *chowkidars* play a vital role in disseminating early warnings, search and rescue, and distributing relief goods. However, they do not have the required logistic support, for example, megaphones (for disseminating early warnings), bicycles and mobile phones (for communication with the community), umbrellas and raincoats (for working within rough weather), torches (for working at night), and heavy knives, axes, and saws (for cleaning debris and uprooted trees after cyclones) (Meeting with UP staff).

The ineffectiveness of the UDMC also has some financial roots: despite its supposed centrality in coordination of recovery efforts, it is a voluntary body - UDMC members are not paid, and financial support for UDMC activities is poor.

Another constraint is that the nationally funded Annual Development Program grants, which fund reconstruction and rehabilitation, are insignificant for the UP compared to higher levels of local and regional government, for example, Zila (district) and Upazila Parishad, and the allocation of these funds is not always transparent and is prone to political manipulation (Asian Development Bank, 2004).

Broader issues of trust also impact UP work. Only national Government resources are channeled through local Government, while the bulk of resources (both from national and international donor organisations) are distributed through NGOs. In general, donors have higher trust in NGOs than in local Government. This reflects the problems of corruption discussed above, and is a further illustration of how weaknesses in “civil social capital” (Callahan, 2005) reduce the capacity of UP to support disaster recovery.

5.5.4 People’s uncertainties about relief support

Local people faced considerable uncertainty about their future access to relief. Generally they had little information about existing and future relief packages, about how long they will continue to receive support, and whether recovery support will be distributed fairly. Moreover, relief packages were not shaped on the basis of assessments of the community’s needs. For example, people’s needs were temporary shelters, but UP provided food, and sometimes households received raw food, yet had no cooking items like fuel or a stove to cook them with. Also, in UP’s relief distribution, the specific needs of the aged, disabled and children were not considered, and their needs were not prioritized. [The NGOs, however, did prioritize these vulnerable groups (FGDs, Household survey).]

In response to these uncertainties, coastal households sometimes followed unfair strategies to receive more relief goods. Focus groups and local key informants reported that when cropping seeds became available, some people presented themselves as farmers. These same people denied having any farming land during distribution of other relief support, as the landless got priority for relief. One disaster practitioner said, perhaps harshly, that “a class of looter, broker, and relief taker has emerged after Sidr, which led to bribery”. Another way to look at this is as an alternative survival strategy of the Sidr-affected poor people.

Local people’s vulnerability and uncertainty is also partly responsible for UP’s corruption. Supporting the exchange of bribes, one household-head said that “who can’t eat (take bribes), can’t bring (can’t broker access)” (*je khaite parena, se anteo parena*). Resonantly, one disaster practitioner commented that people sometimes want to elect a

person who has record of corruption, as they think the person who can take bribes from the local people can also bring recovery projects through providing bribes to the central level. Another disaster practitioner said that sometimes, some people do not see corruption as negative; rather, they see bribes as usual practice. They believe that the UP representatives work hard to bring relief goods from the higher authorities. Consequently, answering a question on “giving a bribe to a UP Member”, a household-head asked a reverse question: “Member has given me relief. I should also give him something, shouldn’t I?” We consider that these people are not directly responsible for corruption; rather, social perception, local culture, and weak governance promote corruption. However, people’s perceptions of normal leadership at the local government level play a key role in maintaining these uncivil norms.

5.5.5 Lack of collaboration between UP and NGOs

Lack of collaboration between NGOs and UP is a further cause of UPs’ weak performance. Generally, NGOs are reluctant to involve UPs with their post-disaster activities. There are a number of reasons for this. The post-disaster relief and recovery capacity of UPs is poorer than that of NGOs, because NGOs receive more donor support than UPs. This reflects donors’ preference for NGOs over UP, because corruption is less prominent in the NGOs than in UPs (FGDs, DPIs). Local NGOs also have a negative attitude to UP and its allied bodies. Disaster practitioners said that in most cases, NGOs do not consider UP as their partner due to fear of losing autonomy. One disaster practitioner said that the national and international NGOs do not involve UDMCs, except in some consultation meetings, because they consider them to be an ineffective and ornamental political body. After a disaster, UP is transformed into a recipient of NGOs rather a partner.

Nonetheless, in principle, UP should be the central actor in implementing all disaster risk reduction and recovery activities, because of UP’s democratic structure and its community connection through village leaders and support staff. In principle, UP is more accountable than NGOs to the local people. There are also concerns that NGOs level of involvement tails off rapidly after disaster recovery funds are expended, whereas UP remains better connected to the community. One disaster practitioner commented, for

instance, that the NGOs return home after completing the funeral activities (*chollisha*—the fortieth day) after a disaster.

To be effective, UP needs national government regular funding for disaster recovery (DPIs, PMIs), and local NGOs collaboration. If corruption issues can be satisfactorily addressed, UP could play a substantially larger role in disaster recovery, partnering with NGOs, rather than being their clients.

5.6. Policy implications

The following policy recommendations build on the above analysis. They are designed to strengthen the contributions of UP to disaster resilience and recovery in Bangladesh. Overall, we align with the “capability approach” to development (Sen, 1999, Nussbaum, 2000), in which the governments’ and national and international NGOs’ aim is to empower local communities, and UPs and other local bodies (working with them as development partners rather than as aid recipients). Increasing local freedom of action, rather than reinforcing a sense of dependence on government and international organisations to run disaster resilience and recovery activities, will build local capacity for the long term.

5.6.1 Reducing corruption

Twenty percent of household-heads were not hopeful of controlling corruption (Household survey), because they saw the corruption-controlling local law-enforcing authorities (e.g., police, and Upazila administration) as also corrupt. Reducing corruption in UP is challenging, as it is entrenched in political life in Bangladesh.

Broadly speaking, major change around corruption will need to come from civil society - from community leaders of different kinds working for change. At the national level, organisations like Transparency International Bangladesh are taking a leadership role. At the UP and village levels, there are civil society leaders who are able to push for reduction of corruption - our interviewees (household survey, FGDs, DPIs) all identified local imams and teachers, and women’s representatives, as good candidates, and identified

NGOs, FBOs (Faith-Based Organizations and other), and CBOs as substantially less corrupt than UP.

There are procedural changes that these groups can work for that would reduce the impact of corruption on relief distribution, specifically:

- About 85% of household-heads emphasised the need to increase coordination between UP and other local actors (Household survey). In particular, involving community leaders - for example, Imams (as FBOs' representatives), village-headmen, and school and madrasa teachers - and local NGOs and CBOs in relief distribution activities would significantly reduce corruption and increase equity. One disaster practitioner suggested that corruption could be minimised through accountability of UP, community participation, providing adequate recovery information to the community, following the "Good Enough Guide"²⁵ (Oxfam, 2007).
- Distribution of relief should be based on an explicit list of which households are most vulnerable. A carefully developed list makes it much harder for distribution to favour partymen, friends and relatives (as discussed above in sections 5.4.2 and 5.4.3). About 95% of household-heads said that the UP representatives should consult with the local people to identify community needs before and after disasters (Household survey) - in effect they are asking for a participatory development approach (Chambers, 1983) to relief distribution. To identify actual vulnerable households, UP, working with other local leaders, could consider the *fitra*²⁶ receivers of a certain village, as the poorest people usually receive *fitra* and people generally do not provide wrong information about *fitra* receivers.

²⁵ The "Good Enough Guide" provides simple steps to put local people at the heart of emergency response. It emphasises simple and practical solutions to make sure that the disaster-affected people are involved in planning, implementing and reviewing an agency's response to an emergency.

²⁶ *Fitra* is a gift of food or money that each matured Muslim individual pays on the day of *Eid-ul-Fitr* (a large religious celebration after Ramadan). This is a charitable tax to be paid to the poor people, which is obligatory in Islam.

There are a variety of institutional development measures that - combined with a widening of local leadership of relief distribution as outlined above - could also improve the integrity of relief distribution.

- Salaries for the UP support staff (*chowkidars*) should be improved, as these are very poor compared to other local government units, for example, Upazila Parishad (as discussed above in section 5.5.3). The low salaries are themselves a catalyst for corruption.
- More than 70% of household-heads emphasised problems with the competencies and skills of UP representatives and support staff (Household survey). UP's capacity in disaster relief and recovery efforts should be strengthened through training the support staff. Better logistical support from national government is also needed, including a regular budget allocation for implementing DRR programs. National and international NGOs could also take UPs on as partners.
- The capacity of UP can be strengthened through decentralisation of power and duties. The UP is a centralised institution, where the dominant person is the Chairman (see section 5.4.4). Chairman could be encouraged to distribute duties and authority among the Members. The UDMC should be strengthened through delegation of power and authority. At a village level, Ward Disaster Management Committees (WDMC) can be formed to better deliver DRR activities locally.

Direct support for local commitment to anti-corruption measures should also be provided. Post-disaster corruption should be reduced through increasing awareness among the community against corrupt individuals, action of law-enforcing agents (FGDs, Local KIIs, DPIs and PMIs). More than 90% of household-heads stressed the importance of arranging an awareness campaign through discussion meetings on corruption in DRR (Household survey).

5.6.2 Other measures to improve UP's contributions to disaster relief

Relief distribution should be coordinated to avoid the duplication of work and provide better services for people by adopting an integrated (Moe and Pathranarakul, 2006), multi-organisational (Raju and Becker, 2013) approach to work at the grassroots levels, in the aftermath of a disaster. The support provided should be needs-based. It is also essential to provide better support for particularly disadvantaged groups, for example, the aged, women, disabled and children (UP did not consider this issue during distribution of relief goods after Sidr, as discussed above in section 5.5.4). Moreover, after a certain period of disaster, cash support needs to be provided rather than relief goods, so that people can buy commodities.

5.6.3 Strengthening DRR activities rather than relief

DRR activities – for example, prevention and preparedness – is crucial for community resilience. UP has some disaster management activities, most of which are post-disaster relief-centered (as discussed in section 5.4.1). To further strengthen community capacity, the Annual Development Program (ADP) of UP should become more DRR friendly. The UDMC could undertake DRR education by running mock drills, providing information on climate change impacts, and outlining the community's role in minimising damage and loss. One disaster practitioner said that the UP should include the woman from each household who manages internal household affairs to disseminate DRR information and provide them with an opportunity to share their needs and experiences. Usually these women make decisions for the family – for example, how much food will be reserved for crisis management, and what will be needed for women, children and aged members. As with disaster relief, if UP can be strengthened sufficiently, along the lines outlined above, national, local and foreign NGOs should include UP as a partner during implementation of DRR activities.

5.7. Conclusion

This paper has given an account of how links between households and UP (a unit of local government) - a crucial linking relationship for households - contributed to disaster

recovery after Cyclone Sidr in Bangladesh. The purpose of the current study was to explore the strong and weak aspects of UP's performance, and discover options for strengthening UP's capacity to actively contribute to disaster resilience and recovery. The findings of this study are intended to be useful to UP, government, and other stakeholders, when developing further policies to enhance linking networks for disaster resilience and recovery in Bangladesh.

This study has found that on the Bangladeshi coast, UP bears significant responsibilities for disaster recovery, including roles for immediate response through to relief distribution, shelter and livelihood assistance, emergency information, reconstruction of major community services, and so on. A number of key issues relating to resilience and recovery were identified in the post-disaster practice of UP. These are:

- UP's contributions to restoring livelihood support, for example, distribution of cropping seeds, nets and repair costs of fishing boats, was significantly less than local people expect of their local government, whose purpose is to represent local people, work for the public good (Local Government Division, 2009). Similarly, UP was only modestly involved in the reconstruction of roads and culverts, after the disaster, despite construction and maintenance of these being part of their regular work.
- During distribution of relief goods and other recovery support, the UP representatives favoured their political partymen, relatives, and friends. The UP representatives often demanded bribes when they distributed new houses, building materials, cash, *Jatka* rice, VGF cards, and repairing costs for damaged houses and fishing boats. The favouritism and corruption fosters inequality and unhappiness, and creates mistrust between the households and UP leaders, damaging linking relationships. Along with the UP representatives, this study has identified the village headmen and local political leaders as often quite corrupt, and has identified various catalysts for corruption and for UP's weak performance generally.

- Despite the UDMC being given top priority in policy, formally, in practice they were ineffective bodies in our study areas, failing to be proactive after Sidr.

Central to addressing these weaknesses is measures to tackle the prevalence of corruption in political culture. This is highly challenging; it seems likely that leverage on this needs to be based in civil society movement - with community leaders such as imams and teachers playing key roles at the local level, and organisations such as Transparency International Bangladesh playing key roles at the national level. For disaster resilience and recovery, we have identified a range of changes that civil society actors could push for, that would improve the performance of UP: (i) procedural changes that could be introduced to reduce corruption through notably increasing community participation in disaster recovery activities, (ii) institutional capacity building that could support better UP performance in recovery, and (iii) programs to raise awareness of corruption and its implications at the local level.

The findings suggest that UP should place more emphasis on DRR activities, not simply disaster relief, to build community capacity and reduce corruption and rebuild trust through fair distribution of relief and other recovery support. The national government should also allocate a regular budget to UP to strengthen local government capacity for implementing DRR policies and programs, as well as promoting community resilience.

The empirical findings of this study provide a new understanding of how UP, as a linking social network actor, works at the post-disaster rebuilding stage and in promoting resilience. In particular, the work shows how even in the most extreme disasters existing linking relationships frame and shape the disaster recovery efforts. This research contributes to existing knowledge and adds value to a growing body of literature on the contribution of UP to disaster resilience and recovery. This research will also serve as a base for future studies.

Although the current study is based on two study villages, the findings regarding UP's contributions to disaster resilience and recovery are expected to apply generally along the Bangladeshi coast, as the hazards and vulnerabilities, the villages' socioeconomic characteristics, and the capacities of UP are almost similar throughout this region (Alam and Rahman, 2014). However, the current study has not analysed how the cyclone victims

rely on other linking networks, for example, NGOs and other CBOs, adapting to the systemic problems with UP's performance; further research on these relationships is needed. Additional research focused on how the contributions of linking relationships to DRR is addressed in existing policy, legislation and regulations is also needed.

The findings of this study also contribute to the literature of social networks and disaster resilience by exploring the relationships between households and UP in coastal Bangladesh. It identifies a range of strengths and weaknesses in these linking relationships, and identifies options to enhance UP's capacities for proactive contribution to disaster resilience and recover.

Chapter 6- Paper 5: Social networks and paradoxes in government disaster policies: how are social networks articulated in the disaster management policies of Bangladesh?

Publication details

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This chapter addresses the key research questions for example, when local government (Union Parishad) as a key linking networks of households contribute strongly and poorly to disaster resilience and recovery, and how the capacities of local government can be strengthened for effectively contribution to disaster resilience and recovery. Addressing these questions, it identifies the strengths and weaknesses of local government.

This chapter describes strong support (e.g. emergency relief, shelter, and livelihood assistance) and poor support (favouritism and corruption during distribution of recovery support) of local government in disaster recovery activities. These strong and weak performance of local government is the key contribution of this chapter. Because, this chapter describes explicitly how local government (as a linking social capital of households) involved with favouritism and corruption during distribution of recovery support after a disaster. This chapter also explores that how these malpractice of local government fosters inequality among the community members, and creates mistrust between the households in the community, and between households and local government leaders. This chapter recommends for improving transparency of Union Parishad and equity in disaster relief, through a mix of procedural changes and institutional development measures. This also shows the pathways to fair distribution of recovery support through effective community participation in the recovery activities in the village level.

Abstract

Bangladesh is one of the most vulnerable countries in the world to the effects of climate change. The frequency of climate extreme events on the Bangladesh coast, for example, cyclones and storm surges, has increased over the last decade. These hazards create enormous damage and loss that increase socioeconomic and ecological vulnerabilities. To address these vulnerabilities, coastal households use their social networking relationships, in particular, bonding (households' relationships with immediate family members and relatives), bridging (households' relationships with neighbours and friends), and linking (households' relationships with organisations e.g. local government, NGOs and other community-based organisations) networks. Many initiatives such as policies, plans and programs have been received to address disaster vulnerabilities. Previous studies have examined the contribution of social capital to disaster recovery in Bangladesh. However, few of them have discussed social networks and disaster policies. This study explores how social networks are articulated in the disaster policies of Bangladesh. It critically analyses the recent disaster management and climate change policies. The review of these policies is juxtaposed with the findings from disaster practitioner and policymaker interviews, meeting with local journalists and local government officials, and NGO workshops. The findings show that despite the importance of social networks in disaster resilience and recovery, these networks are not given adequate emphasis in the government policies, and linking social networks (i.e. governments' link with foreign states, bodies and donors in order to get monetary assistance for national disaster management) are given more focus in the policies than bonding and bridging networks. Moreover, there is a gap between existing policies and ongoing field-level implementation practices – where grassroots' views and needs are typically ignored. This study argues that existing disaster management policies should be revised considering the capacities of local social capital and the needs of local people, rather than following a top-down approach (e.g. policy formulation process is dominated by the government bureaucrats, where opportunity of local community participation is limited).

Keywords: Social capital, Social networks, Disaster policy, Cyclone, Resilience, Coastal Bangladesh.

6.1. Introduction: the disaster problem and social networks

Bangladesh is widely recognised as one of the most vulnerable countries in the world to climatic events (Ministry of Environment and Forests (MoEF), 2009). The geographical location, characteristics of land, diversity of rivers, coastal morphology, and the monsoon climate render Bangladesh highly vulnerable to climate hazards (Disaster Management Bureau, 2010a). The United Nations Development Programme (2004) identified Bangladesh as the most vulnerable country in the world to tropical cyclones and the sixth most vulnerable country to floods. Cyclones and storm surges are two major disasters that affect Bangladesh, with the country being one of the worst affected countries in the world in terms of cyclonic casualties (Disaster Management Bureau, 2010a). In recent years, cyclonic activity in the Bay of Bengal has become more frequent; a severe tropical cyclone hits Bangladesh, on average, every three years (Alam et al., 2011). The cyclones and storm surges cause loss of life, damage to infrastructure and economic assets, and adversely impact livelihoods. The combination of frequent cyclones and storm surges, high population density, massive poverty, and poor infrastructure have led to increased disaster vulnerability and made life difficult for coastal communities (MoEF, 2009).

To address these vulnerabilities, local people usually use their various social networking relationships, because local social network resources are a vital contributor to community resilience and recovery from disasters (Minamoto, 2010, Hawkins and Maurer, 2010, Aldrich, 2010b, LaLone, 2012). With respect to disaster resilience and recovery, social networks have been considered as an important factor for reducing vulnerability through preparing and responding to a disaster (Cutter et al., 2003), facilitating mitigation strategies (Aguirre, 2006), and improving household-level disaster preparedness (Paton, 2003). Many such networks, such as faith-based organisations/community volunteer groups, operate in response to a disaster (Carpenter, 2013). Islam and Walkerden (2014) found that immediately after a disaster, affected people rely significantly on *bonding networks* (households' relationships with immediate family members and relatives), and *bridging networks* (households' relationships with neighbours and friends) to cope with crises, because support provider organisations take at least a few days to reach the affected area. Emergency support in the early recovery phase (i.e. up to a week after a disaster) is crucial for survival and wellbeing of the survivors.

However, these bonding and bridging networks cannot provide support long term due to their limited physical and financial capital, the strengths and weaknesses of these horizontal relationships, and the magnitude of the disaster. For long-term recovery, disaster victims need to seek support through *linking social networks*, for example, from local government, NGOs, and other community-based organisations (CBOs). Despite the importance of local-level social capital resources and networks in community resilience and disaster recovery, the potential roles and contributions of these particular networks are frequently overlooked and considered insignificant by the planners and policymakers (LaLone, 2012).

Immediately after a disaster, bonding networks contribute to recovery through providing comfort, food, labour, remittance, repairing damaged shelters, building materials and so on. Bridging networks support communities through modes such as search and rescue, sharing food and shelter and mutual works (Islam and Walkerden, 2014). Linking networks, for example, NGOs and local government, provide support through such methods as immediate relief (food, water, household utensils), shelter (building materials, new houses), and livelihood assistance (cropping seeds, livestock, fishing boats and nets), reconstruction of major community services (roads, culverts, water and sanitation) (Islam and Walkerden, 2015, NGO workshop). However, this study found some weaknesses in these networks, such as inability of bonding and bridging networks to provide longer-term recovery support; and corruption of linking networks. For example, many local government officials engage in corruption through favouritism (prioritising the people of their own political group) and taking bribes. Also, NGOs generally favour their microcredit borrowers and often take bribes during distribution of livelihood assistance to households. These malpractices foster inequality and discontent, and create mistrust between local households and local government leaders, which, in the long run, affects linking relationships (DPIs & meeting with local journalists).

This study aims to explore how social networks are addressed in the disaster management policies of Bangladesh and what gaps exist between national policies and local-level implementation practices, and identify the possible ways through which existing policies play a proactive role in disaster resilience and recovery. To fulfil these aims, this paper critically analyses the three major disaster policies of Bangladesh – the

Bangladesh Climate Change Strategy and Action Plan 2009 (BCCSAP) (Ministry of Environment and Forests (MoEF), 2009), the National Plan for Disaster Management 2010-2015 (NPDM) (Disaster Management Bureau, 2010a), and the Disaster Management Act 2012 (DMA) (Ministry of Disaster Management and Relief (MoDMR), 2012).

6.2. Disaster management in Bangladesh: responses to climate change impacts and risks

The Government of Bangladesh has recognized climate change as an important issue and has made attempts to integrate potential responses for reducing impacts of climate change (Parvin and Johnson, 2014). The Bangladesh Government has invested in preparedness and prevention to make the country more climate resilient and less vulnerable to natural disasters. Therefore, the Government emphasised the need for immediate international support for building resilience to climate change through participating in the COPs²⁷ (Conference of Parties) of the United Nations Framework Convention on Climate Change (UNFCCC). At the national level, the Ministry of Environment and Forests has created a Climate Change Unit that coordinates all the ministries and networks with all stakeholders – the people, civil society, NGOs, private sectors and international stakeholders (Ministry of Environment and Forests (MoEF), 2009). In addition, the Government of Bangladesh has formed two major funds – the Bangladesh Climate Change Trust Fund (BCCTF) and the Bangladesh Climate Change Resilience Fund (BCCRF) – to maintain the costs of climate change impacts (MoEF, 2009). Based on these understandings and initiatives, over the past decade the Government has developed significant policies and institutional defences against climate change-induced disasters (Alam et al., 2011). Many sectoral policies for example agriculture, environment, water, land, population, health, and food have recognized the issues of climate change impacts (e.g. cyclones, storm surges, soil salinity, and riverbank erosions) (Parvin and Johnson, 2014).

Considering the cyclone hazards in the coastal Bangladesh in 1973 Cyclone Preparedness Program (CPP) was established. Since then till 1990, disaster management meant emergency response and relief rehabilitation. After the 1991 cyclone, the

²⁷ The COP is the highest decision-making body of the UNFCCC. All Member States are the parties to the Convention, represent at the conference, where they review the national communications and emission inventories submitted by the parties (member States).

government of Bangladesh realized the importance of disaster preparedness and comprehensive disaster as the reactive response to disasters. Consequently, in 1993 the Disaster Management Bureau was established. Following that a Standing Order on Disasters (SOD) was formulated in 1997 which was revised in 2010 (Comprehensive Disaster Management Programme (CDMP), 2012). Despite the several sectoral policies and other initiatives for managing cyclone hazards, until 2005 the Government did not have individual disaster management and climate change policies to address anticipated impacts of climate change. The National Adaptation Programme of Action (NAPA) in 2005 was the first policy document in this regard (Parvin and Johnson, 2014). Along with NAPA, the other key policy initiatives are the BCCSAP, NPDM, Standing Orders on Disaster (SOD), and DMA. The basic aims of these policies are to respond to climate change impacts through supreme use of natural resources, receive disaster-resilient initiatives, introduce pro-poor adaptation and mitigation strategies, and promote disaster risk reduction (DRR) activities (General Economics Division, 2012).

6.3. Literature review

6.3.1 Conceptualising social networks as a policy concern

Social capital is a term for the social “resources” that people have as a result of being in the social networks that they are in (Zhao, 2013). Commonly, contrasts are made between the networks they are in, what norms apply to relationships within those networks, and the levels of trust within their relationships (Berke et al., 2008, Hishida and Shaw, 2014). This study originates from the accounts of social capital given by Bourdieu (1984), Coleman (1990) and Putnam (1995). Our emphasis is, also as Putnam (1995, p. 67)) expressed, on “features of social organisation such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit”. Social networks are a crucial embodiment of social capital. This study focuses the notion of social capital as social networks. Because social networks are the focus of this study and because ‘social capital’ necessarily involves the presence of ‘social networks’, in this text we often use the two terms interchangeably, which is also evident in other studies (e.g. Aldrich, 2012, Zakour, 2008).

Social networks consist of actors and their relationships. These actors may be individuals, groups, organisations and communities. Social networks are relationships that have developed amongst these actors through familial ties, friendships, organisational life, and other types of social connections (Carpenter, 2013). During a disaster, these relationships are utilised and/or formed other types of social networks for example political, religious, medical and media (Aguirre 2006; cf. Carpenter, 2013). These networks can be differentiated based on the kinds of social connection between people, into bonding networks, bridging networks and linking networks (Woolcock, 2001). This study focuses on these three kinds of networks of households to understand how these networks are articulated in the disaster policies.

6.3.2 The focal points of key policy analysis papers

Several disaster and policy studies have emphasised various issues to include in the public policies for disaster risk reduction (DRR) and climate change adaption (CCA). These papers are chosen randomly from the literature of disaster policy analysis considering the global, regional (subcontinent), and Bangladesh context. Table 6.1 is organised based on the key analytical themes of reviewed papers (e.g. vulnerability, preparedness and prevention, response and recovery, partnerships and capacity building, and political context). The key aim of this table to explore the key discussion of policy analysis papers and identify the research gaps.

As a field, scholarship on disasters and public policies comprises a diverse set of issues over a broad range of fundamental areas, such as disaster vulnerability, response and recovery, partnerships and mitigation (Gerber, 2007, & Table 6.1). There has been little and indirect focus on social capital and local capacities in the current disaster policy research literature; most references to it are indirect or treat it as context. In this article, we review the key disaster management policies of Bangladesh as a means of highlighting their treatment of local social networks.

Table 6.1 Focal points of key policy analysis papers

Analytical themes	Authors, key foci	How social networks are addressed
Vulnerability	Parvin and Johnson (2014) described that disaster vulnerability of grassroots communities is inadequately highlighted by the existing climate change policies in Bangladesh. Instead, Gerber (2007) considered disaster vulnerability as the key policy learning in the post-Katrina context of USA.	Both authors emphasised the “vulnerability of disaster-affected community”, which is considered the <i>bridging networks</i> of local households.
Disaster risk reduction, preparedness, and prevention	Ahmed (2013) found that the <i>Disaster Management Act</i> of Pakistan (PNDMA) does not directly mention DRR and that there are no directions about funds for DRR programs. The PNDMA emphasises institution building and action plans for disaster mitigating rather than mainstreaming DRR. Henstra and McBean (2005) emphasised inclusion of mitigation in the Canadian disaster management policies as the pre-disaster strategies of preparedness, and prevention. They also identified several political barriers that have impeded the full incorporation of mitigation into disaster management policies. In addition, the DRR functions of South Africa are problematic, there is inadequate funding, and overall DRR knowledge and capacities are insufficient (van Niekerk, 2014).	Ahmed’s discussion of “institution building” is linked to <i>linking social networks</i> . Henstra and McBean’s analysis does not link with social networks. Van Niekerk emphasised the opinion of various stakeholders (e.g. officials of government and private sectors, and academics) on the Act and DRR, which implies the <i>linking networks</i> .
Response and recovery	Emphasising the community’s response to hazards, Gerber (2007) considered three key policy learnings – instrumental, social and political – that might be necessary to reduce the likelihood of future policy failures. Community-based rebuilding strategies need participation from the affected community, civil and commercial society, and use of local social capital (Chamlee-Wright and Rothschild, 2007). Prioritising disaster insurance as a key recovery support in the USA, Harrington (2000) suggested that the recovery support from both private and government insurance companies should work together to make disaster policy more effective, and for better risk management.	Gerber’s focus of “community’s response to hazards” is linked to <i>bridging networks</i> . The discussion of Chamlee-Wright and Rothschild indicates both the <i>bridging and linking networks</i> of a disaster-affected community as this paper talks on civil society and community’s involvement in the rebuilding process after a disaster. Harrington’s priority of Government and private insurance support, which is a <i>linking networks</i> of disaster-affected community.
Partnerships and capacity building	Comfort et al. (1999) emphasised the coordinated effort to assess the risk of vulnerable communities; and exchange of multi-way information to strengthen capacity and increase participation of the community to reduce disaster vulnerability. A functioning partnership, and an integrated role of Government, NGOs and donors is essential for effective implementation of existing disaster management policies and programs in Bangladesh (Khan and Rahman, 2007, Haque et al., 2012a).	Comfort et al.’s preference for coordinated efforts, exchange of information, and community participation imply the <i>linking networks</i> . The discussion of integrated roles of different stakeholders in the policy implementation process indicates the <i>linking relationships</i> amongst Government, NGOs and foreign donors (Haque et al. 2012; Khan & Rahman, 2007).
Political context	Alam et al. (2011) discussed how policy initiatives are influenced by the interplay of donors, and power relations in Bangladesh. They argued that planning processes should consider actors from across sectors and population groups. Instead, the political economy of climate change initiatives in Bangladesh leaves little scope to address vulnerability of grassroots communities (Parvin and Johnson, 2014).	Alam et al.’s discussion implies the <i>linking relations</i> amongst Government and other stakeholders. Instead, Parvin & Johnson’s discussion does not indicate the <i>social networks</i> issue.

6.4. Research methods

6.4.1 Study approach

This paper followed a qualitative research approach. The research is aimed at analysing how social networks are addressed in the disaster policies in Bangladesh. For this purpose, social science policy analysis approach was useful, which is similar to that of Haque et al. (2012a). The policies analysed were those developed between 2005 and 2014. During this period, Bangladesh experienced several devastating cyclones and widespread floods that caused human casualties and immense damage and loss, which led Bangladesh to formulate some of its key policies (Khan and Rahman, 2007). There have been three analytical approaches widely used in the domain of policy argument; these are, *analycentric*, *neo-positivist* and *critical-rationalist* approaches (Dryzek, 1993, Hoppe, 1999). This study follows the *analycentric* policy analysis approach, which relies on data and insights from secondary sources (Hoppe, 1999). We critically analysed three key disaster and climate change policies to discover how “social networks” are addressed as a strategy of disaster resilience and recovery. In addition, this paper reviews the secondary literature on “disaster and policy” to obtain critical views and a background (e.g. key focus, analytical themes, and research gap) of disaster management policies in national, regional and global contexts. Therefore, the *analycentric* policy analysis approach is an appropriate choice for this study.

6.4.2 Data sources, data collection tools, and sampling

Data sources were both primary and secondary. For the primary data sources, this study conducted disaster practitioner interviews (DPIs) and policymaker interviews (PMIs – senior government employees involved with relevant ministries and departments), workshops with local NGOs, and meetings with local government officials and local journalists. Secondary data includes Government policies, study reports from NGOs and other organisations, journal articles, books, newspaper clippings, and Internet resources. The researchers used semi-structured interview checklists for qualitative data collection, and note-taking methods were used during interviews, workshops and meetings (Muswazi and Nhamo, 2013). The first author and two research assistants took individual notes

(rather than recording) during interviews, workshops and meetings. The individual notes were cross-checked and finally documented by the first author. The participants of the workshops, meetings and PMIs were selected purposively, and a snowball sampling technique was followed to identify the participants for DPIs. These policy documents (e.g. Bangladesh Climate Change Strategy and Action Plan, National Plan for Disaster Management, and Disaster Management Act) are selected purposively based on their area of focus (e.g. climate change and disaster) and importance (as the government of Bangladesh widely uses these recent documents for disaster management and climate change adaptation). Information was obtained from primary and secondary sources on:

- the extent of climate change-induced disasters and their effects
- existing disaster management policies and implementation processes (institutional arrangements/structures and stakeholders)
- discussions of social networks in the policy documents
- gaps between policies and local needs, and implementation problems at the national and sub-national levels
- recommendations for strengthening the policies.

6.4.3 Data analysis

Following the content analysis approach, the authors explicitly contextualised the content of interviews, workshops and meetings, and discussion of social networks in the policy documents. Firstly, data were collected and documented and conversations with participants were written out. Secondly, data were coded and categorised with primary concepts, research objectives and key themes (Schutt, 2011). Each category of data was labelled with a code – usually a short phrase, for example, “importance of social networks in recovery”, “social network discussion in the policies”, and “how local community is affected by the inappropriate efforts of linking networks”. Finally, through analysing the notes of interviews, meetings and workshops, and the key focuses of policy documents, the key findings were drawn out as quotations and in descriptive form.

6.4.4 Analytical framework to review policies

With a view to understanding the context of disaster policies in Bangladesh, and explore how social networks are addressed to face the climate change-induced disasters, this analytical framework is drawn (Fig. 6.1). Underpinning the notion of social networks, this framework comprises two major contexts to analyse the disaster policies in Bangladesh. First, the causal facts – climate change and disaster context – which reviews the policy background, aims, and key strategic foci that have led to the institutional initiatives both at national and sub-national levels. Second, the management logic – the policies and programs – which focuses on climate change and disaster impacts, vulnerabilities, and use of social networks by the affected households that have led to institutional initiatives to address disaster risks and vulnerabilities.

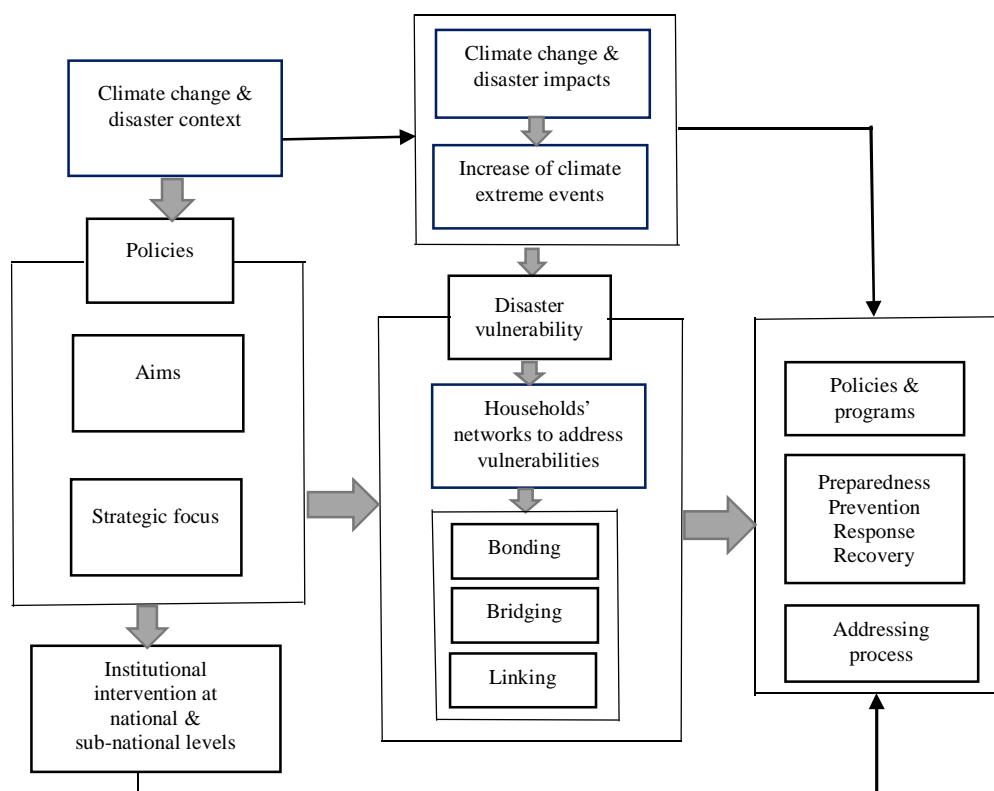


Figure 6.1 Analytical framework to review policies

6.5. Synopsis of the reviewed policies

Bangladesh became a global leader in its institutional framework for DRR, with a number of core government policies and plans incorporating risk reduction, climate change adaptation, and sustainable development (United Nations Development

Programme (UNDP), 2014). The main thrust of this institutional framework is to reduce human, economic and environmental loss, strengthen national and local capacities, and promote cross-sectoral partnerships through an integrated approach (UNDP, 2014). This section summarises the key policy documents indicating the background, aims and strategic focus (Table 6.2).

Table 6.2 The background, aims and strategic focus of major disaster management policies

Policies	Background	Aims	Strategic focus
BCCSAP	The BCCSAP was first prepared in 2008 by the Ministry of Environment and Forests. There are three distinctive phases of BCCSAP (Alam et al., 2011): <i>first</i> , began in November 2007 when Government signed a Terms of Reference with the Department for International Development (DFID) for a policy support grant; <i>second</i> , began in March 2008 and launched the first version in London at the UK-Bangladesh Climate Conference in September 2008; <i>third</i> , in 2009 the newly formed Government set up a ministerial committee to revise this. The committee redrafted in August and the cabinet approved in October 2009.	To integrate climate change constraints and opportunities into the overall plans and programs involving all sectors and processes for economic and social development.	This policy focused on six thematic areas: food security, social protection and health; comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building and institutional strengthening.
NPDM	The NPDM is a strategic document to be effective for a certain period of time (2010-2015), prepared by the Disaster Management Bureau (DMB). This is an outcome of the national and international commitments of the Government for addressing the disaster risks comprehensively. This provides the overall guideline for all relevant sectors and committees to prepare and implement their role-specific plans. The DMB, being the focal actor, will lead those role-specific plans for DRR and emergency management (Center for Excellence, 2012).	To reduce the risk to the poor and the disadvantaged people from the effects of natural, environmental and man-made hazards. And to develop an effective emergency response system for managing large-scale disasters.	DRR through institutional capacity building.
DMA	The DMA is prepared by the Ministry of Disaster Management and Relief to enforce disaster management rules, regulations and mechanisms, and standing orders for enabling Bangladesh to better address disasters. It was approved by the Parliament on 12 September 2012 and came into effect on 24 September 2012.	To develop an effective disaster management structure to respond to all kinds of disasters through the coordinated and objective-driven programs.	Develop an effective institutional framework for disaster management through launching DRR programs, providing emergency humanitarian assistance, and undertaking rehabilitation programs.

Source: Ministry of Environment and Forests (MoEF) (2009), Disaster Management Bureau (2010a), Ministry of Disaster Management and Relief (MoDMR) (2012).

6.6. Social networks in the policy documents

Social networks are important in disaster management, because households' social networking relationships (e.g. bonding, bridging and linking networks) contribute to disaster resilience and recovery. This section explores how these important issues are corresponded in the different sections of the policy documents, for example, the BCCSAP, NPDM and DMA (Table 6.3).

Table 6.3 Corresponding social networks in the policy documents

Social networks	BCCSAP sections	NPDM sections	DMA sections
Bonding (indicates households and family members)	Chapter 3 explores households' vulnerability to climate extreme events through diseases, and loss of housing, land, food, and income.	Chapters 2 and 3 address the impacts of various hazards on human casualties, injuries and disease, and damage and loss of shelter, livestock, cropland, income etc. that weaken households' capacity and make them more vulnerable.	Not discussed.
Bridging (suggests community as a whole)	Chapter 4 prioritises supporting communities and rural people to strengthen their resilience and adaptive capacity to withstand climate change impacts.	Chapter 1 acknowledges communities' risks and vulnerabilities to climate change. Chapters 3, 7 & 8 emphasise a bottom-up approach to DRR and climate change adaptation (CCA) for promoting human security, empowering the community to better understand disaster risk, and building resilience.	Article 9(B) emphasises providing humanitarian assistance and taking early recovery and rehabilitation programs for the affected communities.
Linking (implies linking relationships at the local, national and global levels)	Chapter 1 emphasises <i>networks</i> at global (participation in the international negotiation meetings for example, COPs), national (coordination with the ministries) and local levels (coordination with people, civil society, and NGOs) for building resilience to climate change. Chapter 4 focuses on increasing households' capacity through irrigation schemes, agricultural research, and greenbelt projects. And also stresses on capacity building of government and development organisations to tackle climate change impacts through an integrated approach. Chapter 5 focuses on building partnerships with civil society to implement social forestry as a key adaptation-mitigation strategy. Chapter 6 emphasises building capacity of communities, civil society, the private sector and the Government to tackle adverse impacts of climate change. And Government seeks support of the international community to assist in implementing long-term climate-resilient strategy. In addition, the BCCSAP stresses building institutional capacity through six key pillars: food security, social protection and health; comprehensive disaster management; repair and maintain infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building and institutional strengthening (Annex).	Chapter 1 focuses on duties of Government, NGOs and private sectors for disaster prevention, mitigation and preparedness planning, and their coordination to avoid repetition of programs. Chapter 4 indicates the DRR links to various national, regional and international bodies such as Poverty Reduction Strategy Paper (PRSP), NAPA, BCCSAP, SAARC Framework for Action (SFA), Millennium Development Goals (MDGs), Hyogo Framework for Action (HFA), and United Nations Framework Convention on Climate Change (UNFCCC). Chapter six focuses on a well-coordinated program framework incorporating Government, NGOs, civil society, private sector and external donors to achieve the strategic goals and vision of disaster management. Focuses on strengthening institutional mechanisms, for example, national disaster management council, and inter-ministerial disaster management coordination committee, and building capacity of all disaster management committees to ensure effective planning and coordination of DRR and emergency response management (Chapters 7-10). Chapter 11 emphasises multipurpose cyclone shelters, which will be constructed and maintained by the collaboration of GOs and NGOs. In addition, Government shall develop disaster-resilient cluster housing for marginalised people as an alternative housing option, where existing houses will convert into shelters. Emphasises holistic and multi-sectoral approach (combination of all stakeholders) to address strategic goals and priorities (Chapter 13).	Article 4(1) focuses on institutional framework where National Disaster Management Council shall work to reduce disaster risk of the vulnerable population through formulating disaster management principles, plans, and programs through collaboration with relevant authorities. Article 12(1) indicates that a National Disaster Management Research and Training Institute will undertake research on the impacts of disaster and climate change, and capacity building of disaster management processes and other related functions. In addition, a body of national volunteers with other stakeholders will determine their functions to provide speedy and effective emergency response at the pre-, during-, and post- disaster phases (Article 13(1)). Article 18(1) ensures that local disaster management committees (e.g. City Corporation, District, Upazila, Puroshava, and Union Disaster Management Committee) will also work to reduce disaster risks and vulnerabilities. Article 25(1) focuses on involving any NGO or individuals to participate in disaster management activities in the distressed area. In addition, different forces (e.g. Army, Police, Rapid Action Battalion, Coast Guard, Border Guard Bangladesh, Ansar and VDP including semi-armed and non-armed forces) will participate in emergency response activities (Article 30). Article 32(1-2) identifies the National Disaster Management Fund sources such as donation of government, foreign governments and organisations, local authorities, and respected individuals. Article 34 indicates that Government can ask mass media to broadcast information for creating public awareness in early warning and disaster preparedness. And when conducting relief operations, Government can seek cooperation from foreign countries and donors (Article 53(1)).

Source: Source: Ministry of Environment and Forests (MoEF) (2009), Disaster Management Bureau (2010a), Ministry of Disaster Management and Relief (MoDMR) (2012).

6.7. Big issues, small steps: missing social networks in the policy documents

As a disaster-prone nation, Bangladesh has made significant progress in formulating policies for disaster management and climate change adaptation. However, local capacities and vulnerabilities of local communities are not adequately focused on the policies. Despite the importance of local social capital in disaster resilience and recovery, the existing policies have not recognised the contribution of local social capital to disaster risk reduction and climate change adaptation in the Bangladesh coast. This section explores how social capital has received limited attention by the existing policies.

6.7.1 Little focus on bonding and bridging networks

Bonding networks (households' vulnerabilities, and their relationships with immediate family members and relatives) are not focused on in the policies. The BCCSAP and NPDM indicate disaster impacts on humans (injuries, diseases and deaths), livestock, crops, food, shelter and income, which increase households' vulnerability and decrease the capacity to respond to a disaster. Instead, the DMA does not discuss bonding networks (Table 6.3). Bridging networks (households' relationships with neighbours and friends i.e. with other community members) are given less focus than linking networks (Table 6.3). However, considering communities' risks and vulnerability to disasters, few sections of the policy documents place emphasis on enabling the community through DRR, CCA, humanitarian assistance, and rehabilitation programs for promoting resilience. The policies give no clear indication as to how these programs will be implemented at the grassroots levels, and how households' capacities to face future disaster risks and climate change impacts will be increased. There is a critical role of policy and social capital to identify and reduce disaster vulnerability at the individual and group levels (Eakin and Luers, 2006). Therefore, disaster policies should consider the capacities of local social capital (bonding and bridging networks) and provide clear indication how community vulnerabilities would be reduced, and how preparedness of vulnerable communities can be increased through a combined initiatives of national government and local social capital (Aldrich, 2011c). Joshi and Aoki (2014) emphasized on combined initiative to rebuild the villages after a disaster.

6.7.2 More focus on national, regional and global networks than local

The policy documents place more emphasis on the top-level linking networks than grassroots networks. For example, the Government stresses creating relationships with national organisations (ministries, departments, disaster management committees, local government, national NGOs, media, and national forces, etc.), foreign states, regional forums (SAARC, ASEAN, etc.), international bodies and initiatives (COP, UNFCCC, MDGs, HFA, etc.), and foreign donors (Table 6.3). The aims of top-level links are to collect money for the National Disaster Management Fund from donations of foreign governments, bodies and organisations, and national and local authorities (DPIs). The Government also creates these links to seek cooperation during relief operations after disasters. The reviewed policies focus on increasing households' capacity through irrigation schemes, agricultural research and greenbelt projects. The policies emphasise the building capacity of the Government and development organisations, and apply an integrated approach to implementing these projects and tackling climate change impacts and disaster risks (Table 6.3). However, the policies do not mention households' and communities' links with other stakeholders.

6.7.3 Government reports ignore the contribution of social networks to disaster recovery

The contribution of local communities to disaster recovery is not recognised in the Government post-disaster reports. The government reports normally quantify the contribution of different sectors to the recovery process, for example, government sectors 70%, foreign donors 20%, and NGOs and private sectors 10%. There is no acknowledgement of the enormous contribution of local communities during the early stages of recovery (DPIs, NGO workshops). We reviewed the two post-disaster reports to identify the contribution of government institutions (ministries, departments, armed forces, local government, etc.), foreign states, international organisations, and NGOs to immediate response and recovery after a disaster (Beck, 2005, Economic Relations Division, 2008). There is no recognition evident in these reports about the contribution of local communities and affected households (i.e. the local social capital). However, at the early stage of disaster recovery, immediate household members, relatives, neighbours and friends contribute to each other through such actions as search and rescue, emotional

support, sharing food and shelter, cooperative works and loans (Islam and Walkerden, 2014). Aldrich (2008) resonantly said that after a disaster government and NGOs should emphasize on rebuilding local social capital (e.g. strengthening shared trust, communication, and commitment within local communities and neighbourhoods to return and stay together) through providing new skills or repair social connections.

One disaster practitioner stated that post-disaster mutual cooperation is high in the rural areas of Bangladesh; for example, repairing damaged houses, fishing nets and boats, and crop harvesting. People usually do this as their social responsibility, and they gained this idea through their cultural and religious practices. This solidarity is found in the study villages after the Cyclone Sidr (Islam and Walkerden, 2014, & see Chapter 2). The government policy does not consider this social capital, only the media sometimes highlights the contribution of local social capital in certain community contexts (DPIs). Another disaster practitioner said that due to the absence of recognition of local social capital, relief dependency is increasing at the local level. He argued that relief provider organisations are destroying the social capital, as they often do not consider the capacities of local communities/social capital during distribution of relief goods. Consequently, the affected communities usually depend on relief goods and are always eager to know when relief will come after a disaster (Islam and Walkerden, 2015, & Chapter 4). Due to the lower emphasis on social capital and failure to provide a comprehensive awareness of the capacities of local communities to the donors, the capacities of local social capital are declining (DPIs).

6.8. Paradoxes of government disaster policies: impacts on social networks

Previous section discusses how social networks are overlooked in the policy documents. This section identifies key inconsistencies (e.g. top-down policy formulation approach, lack of coordination, corruption, etc.) of disaster policies that affect social networks (specially linking social networks) to contribute effectively to disaster resilience and recovery in the cyclone-affected coastal villages in Bangladesh.

6.8.1 Top-down approach

Climate change and disaster policy formulation has been dominated by government bureaucrats and power elites rather than taking into account the people-centred initiatives of disaster-prone areas (Alam et al., 2011). For example, a wide range of actors are involved in the formulation process of BCCSAP, such as political parties, civil bureaucrats, community experts (e.g. economists, engineers, and environmentalists), internationally concerned campaign groups, and bilateral and multilateral donors (Alam et al., 2011, & Table 2), but the direct involvement of the most vulnerable people affected by climate change is largely absent (Hossain, 2009, Raihan et al., 2010). The disaster practitioners also recognised this reality and said that local people's voices are broadly absent from the other policy formulation and implementation processes (DPIs). Instead, the policymakers said that the NGOs participated as the local community's representatives in the policy formulation process. However, NGO workshop confirms that local NGOs have not participated in the government policy formulation process. Moreover, a top-down approach is observed in executing the thematic strategies, for example, "research and knowledge management", and "capacity building and institutional strengthening". The BCCSAP does not include capacity building of local households, communities, institutions and community-based organisations (CBOs) (Parvin and Johnson, 2014).

One disaster practitioner said that during the formulation process of Disaster Management Act (DMA), the government bureaucrats did not include any national disaster experts. The disaster practitioner community was disappointed when they saw the DMA. They gave many comments on the DMA, but the government policymakers did not pay attention to their feedback. The practitioner said "I gave four rounds of comments on DMA, but nothing was taken from them." He added that the NPDM is not a successful policy document, as those who prepared this they have limited knowledge, and experience on disaster management, and less intellectual capabilities to formulate a policy. He claimed, "The NPDM is not a national plan but rather a plan of CDMP"²⁸ — is an organization working on comprehensive disaster management.

²⁸ The Comprehensive Disaster Management Program is a collaborative initiative of the Government of Bangladesh and UNDP to strengthen national capacity to manage disaster risks.

6.8.2 Lack of coordination

Coordination problems prevail at the local level. The institutional structure of the government dealing with implementation of disaster policies and programs at the local level is three-tiered; these tiers are Zila Parishad (district level), Upazila Parishad (sub-district level), and Union Parishad (UP—local government level). The coordination mechanism at Zila and Upazila levels is useful, but there is no opportunity for the Union-level bodies to coordinate disaster management policies and programs (Parvin and Johnson, 2014). However, Union-level coordination is crucial for effective disaster management in the coastal villages. At the Union levels, coordination is done by the respective disaster management committee (DMB, 2010; NPDM Chapter 10). The Union Disaster Management Committee (UDMC) cannot play an effective role in coordination and monitoring the plans and programs due to political nepotism, corruption, irregular meetings, and centralise power. Because the UP Chairmen (elected representatives) are the key decision makers of UDMC (DPIs, NGO workshop). Moreover, uncoordinated efforts between UP and NGOs were seen during disaster response activities after Cyclone Sidr (DPIs, NGO workshops). The NPDM focuses on coordination at the national level of disaster-related activities through the National Disaster Management Council (NDMC) and the Inter-Ministerial Disaster Management Coordination Committee (IMDMCC). In addition, the DMA has placed strong emphasis on national disaster response coordination, but after the Brahmanbaria Tornado in 2013 we have seen a lot of coordination gaps in the emergency response at local and national levels (Dil Nahar, 2013). Due to the lack of coordination, disaster-affected communities do not get the best services from their linking networks, for example, from local government, NGOs and other CBOs.

6.8.3 Mainstreaming disaster risk reduction is an ineffective effort

Mainstreaming disaster risk reduction (DRR) with other development policies and organisations is crucial, as disaster is not a sector but rather an issue relating to all development (DPIs). Therefore, DRR should include with development plans and programs, as this not only the business of ministry of disaster management. These issues are well articulated in the government policies. For example, the NPDM views DRR as the key to achieving through the collaborative efforts of government, NGOs, and private

sectors (NPDM Chapter 8, Article 8.2). The NPDM also spells out how DRR will be implemented from national to community levels across the whole country (Disaster Management Bureau, 2010a). Due to corruption, political interference, bureaucratic intricacies, weak local government capacity, and lack of coordination amongst GOs, NGOs, and private sectors, mainstreaming DRR strategies is not effective (DPIs, NGO workshop, Williams, 2011, Parvin and Johnson, 2014, Alam et al., 2011, Khan and Rahman, 2007). Thus, the local community is deprived of the benefits of linking networks.

The disaster management policies are not integrated. The three distinct authorities prepare three major policy documents. For example, the Ministry of Environment and Forests, the Disaster Management Bureau, and the Ministry of Disaster Management and Relief prepared the BCCSAP, NPDM and DMA, respectively. These three documents look at DRR through different lenses. For example, the BCCSAP looks DRR through *mitigation approach* (e.g. infrastructure development, social protection, low carbon development, etc.) (Ministry of Environment and Forests (MoEF), 2009). The NPDM looks DRR through *institutional capacity building approach* (Disaster Management Bureau, 2010a), and the DMA looks it through *humanitarian assistance approach* (e.g. emergency relief and rehabilitation) (Ministry of Disaster Management and Relief (MoDMR), 2012).

Also, there is a lack of commitment of the political leaders to climate change and disasters. Therefore, DRR and building disaster-resilient community has not yet been included in an agenda of the most political parties in Bangladesh, which is also a major cause of being mainstreaming DRR unsuccessful.

6.8.4 Corruption within policy implementing authorities

Corruption is also a barrier to implementing the disaster management policies and programs at the grassroots level. The policy-implementing authorities (e.g. ministries, departments, local governments, and NGOs) are often involve with corruption (Khan and Rahman, 2007, DPIs, FGDs). Local NGOs and local government are involved with post-disaster corruption through favouring their own microcredit borrowers and political partymen, respectively, as well as taking bribes and misusing relief goods during

distribution of recovery support (DPIs, NGO workshops, & Islam and Walkerden, 2015). At the national level, GOs and NGOs are also involved with corruption. For example, the Government recently found 50 corrupt organisations that misused the funds of the Bangladesh Climate Change Trust Fund (BCCTF) through their different projects; the Government has stopped releasing further money to 19 of these organisations (Mahmud, 2015). Also, due to corruption, the World Bank denied continuation of the managerial responsibilities of the Bangladesh Climate Change Resilience Fund (BCCRF), a donor-funded program (Prothom Alo, 2015). Sometimes, highly ranked government officials are also involved with this corruption. Understanding this, the Minister of Environment and Forests said that they will restore their ministry's image to take action against the corrupt individuals and projects (Daily Star, 2014).

The existing policies are not enough to control this corruption; rather, some loopholes have given more freedom and security to government officials (DPIs). One disaster practitioner said that the DMA has given indemnity to government bureaucrats to be involved with post-disaster corruption. He added that the fundamental aim of the DMA is to empower the affected people and preserve their rights. But this Act ensures the protection of government officers and includes the provision for punishment of the local people. The DMA strongly emphasises the penalty and punishment for raising false claims against disaster management activities (Article 38). It also says that if an individual insults the designated government disaster management officials, they will be punished by imprisonment or with a fine (Article 36(a)). The DMA mentions that if an individual with responsibility of controlling disaster management resources misuses and utilises such resources for their personal interest, they will be punished (Article 39). However, the reality is that due to the fear of punishment (as the provision of Article 38), local people do not venture to complain against the government officials, even if the people see the officials being corrupt (FGDs, DPIs). A focus group reported that they saw some corruption activities during the distribution of recovery support and reconstruction works after Cyclone Sidr. However, they did not complain to the law-enforcing agents, as they know this complaint does not work, as the corruption controlling authorities (e.g. law-enforcing agents) are sometimes also involved in corruption. Besides, if they complain, the corrupt officials can harass the complainants, refute the corruption allegations, or prove the allegations as false through abusing their power, as they have good connections

(*unholy alliance*) with the local law-enforcing agents. These are major drawbacks of the DMA. Thus, local people are deprived of their due disaster rights.

6.8.5 Faulty housing distribution practices

Post-disaster housing distribution practices of the Government is flawed. According to the distribution policy, only the “affected landowner households” (who have their own homestead and farming land) are eligible to receive new houses (DPIs). The most vulnerable landless people (who usually live on the Government lands in the area at risk, which are close to or outside the protection of the embankment) are not considered. Due to this inefficient housing distribution practice, the incidence of traditional joint families is declining in coastal Bangladesh (DPIs). For example, one household-head had five children and they were living together in an extended family. When the Government announced that only landowner-households would get housing facilities as part of the post-disaster rehabilitation program, the five children wished to build individual households and asked their father to distribute land among them. Thus, after Sidr, the number of households increased abruptly compared to pre-disaster times, which affected joint families, and the aged parents became insecure. The unmarried female children of the family also became insecure and suddenly dropped out of school. A disaster practitioner said, “This is not a culturally friendly decision, for which bonding networks are being broken down rather than strengthened.”

6.8.6 Inadequate facilities in the cyclone shelter centers

Community cyclone shelter centres are a crucial emergency preparedness plan of the Government, locally implemented by the Cyclone Preparedness Program (CPP) through their community volunteers (Department of Disaster Management (DDM), 2013). This is an important linking network of coastal people. They consider shelter centers as safer places during cyclones, because most of the coastal houses are not strong enough to withstand cyclones and storm surges (Islam and Walkerden, 2014). However, inadequate facilities are prevailing in the shelter centers – for example, limited access due to huge crowds, insufficient toilets, no separate place for poultry and livestock, distance from homes, rough roads, and lack of communication. One disaster practitioner said that the

shelter centers are not culturally friendly, and there is no additional places in the shelter centres to protect their minimum household resources (e.g. poultry and livestock). Therefore, people cannot go there with their resources. Lack of privacy for women and adolescent girls is also a drawback of the centres. An old woman said, “I didn’t go to the shelter center during the last cyclone. Only those women will go there who don’t have any social self-respect” (DPIs)—which implies a lack of women-friendly environment in the shelter centres. Due to these practical problems, local people do not achieve full benefit from the centers.

6.8.7 Accuracy of early warning

The early warning provider organisations, for example, Bangladesh Meteorological Department, Cyclone Preparedness Program (CPP), Flood Forecasting Warning Center (FFWC), and the Centre for Environmental and Geographic Information Services (CEGIS), are also linking networks of local people, and they have been working on community-based early warning dissemination. But the question is how accurately and effectively these organisations are disseminating signals, and how local people perceive these. One disaster practitioner described the case of a coastal storm in 2012 in the south-east areas of Bangladesh. Few people died from that event, but damage and loss was high. The local people claimed that they did not get any warning signals. In addition, during cyclone Sidr, the warning signal abruptly jumped from 4 to 9 (e.g. signal 4 provides local warning, signal 5 to 7 provides danger cautionary, and signal 8-10 provides great danger warning). Due to this inconsistency of warning signals, local people did not get much time to move to a safer place, which caused more human casualties (DPIs).

The Government does not withdraw warning signals, which is another problem of early warnings. For example, during the Indian Ocean Tsunami in 2004, an early warning was given in Bangladesh but it was not withdrawn even though it was not going to hit the Bangladesh coast. Consequently, during Sidr, many people did not believe the early warning signals, because at the early stage, several warning signals were disseminated and nothing happened, and these were not withdrawn. At the time of the final warning signal, people thought that nothing had happened earlier, so nothing was going to happen this

time (CPP official). Also, early warning messages through mobile phones were not in Bengali but in English, which is difficult for the local people to understand.

6.9. Recommendations: integrating social networks into the policies

This study explores how social networks are articulated in the disaster management policies of Bangladesh and identifies the gaps exist between national policies and local-level implementation practices. Based on the findings this paper identifies the possible ways through which existing policies play a proactive role in disaster resilience and recovery. There are a number of measures that can be considered for effective and integrated disaster management policies in Bangladesh. Some recommendations are suggested below.

6.9.1 Local social networks should be prioritised in the policy

Social networks are considered as “social insurance” for the disaster-affected people of coastal Bangladesh, because households’ networking relationships help each other at the pre-, during- and post-disaster stages. Especially, bonding and bridging networks significantly contribute to the early recovery phase (as discussed in section 6.7.3, details are in Chapter 2, & Islam and Walkerden, 2014). Priority should be given to building households’ capacities through providing alternative income opportunities, robust housing, and livelihood security. Both the Government and NGOs should take these responsibilities through proper implementation of ongoing DRR and CCA projects.

Recognition of the contribution of local social capital to disaster resilience and recovery should also be noted in the GOs and NGOs post-disaster reports, through which “strengthening local community capital” would seek the attention of foreign donors (as discussed in section 6.7.3). The disaster management policies have placed more emphasis on linking social networks of Government (through creating relationships with national, regional and international organisations and forums) than community’s links with national and local development agents, for example, local government, NGOs and other community-based organisations (CBOs) (as discussed in section 6.7.2). National and foreign NGOs, with the collaboration of CBOs and other community initiatives (e.g.

volunteers, informal occupational groups, etc.), would develop the local linking relationships and strengthen capacities to reduce disaster risks, and promote resilience.

6.9.2 A bottom-up and top-down approach should follow to formulate and implement policies

A bottom-up and top-down approach is crucial for strengthening the participatory process for community resilience and sustainable disaster management (Fraser et al., 2006). However, in Bangladesh, disaster management policies are devised through a top-down approach by the Government and political elites, and implemented by the bureaucrats and service provider organisations, and grassroots participation is absent (as discussed in section 6.8.1). Thus, local needs, capacities and socioeconomic conditions have not been fully addressed in mainstream disaster management policies of Bangladesh (Asgary and Halim, 2011). Therefore, local people's preferences should include in the disaster policies for reducing vulnerabilities from cyclones. In this regard, there is need a shift to follow a bottom-up policy formulation approach, where the target groups of policy (e.g. disaster-affected communities), local actors (e.g. GOs, NGOs and other CBOs), national disaster experts and practitioners should be included (DPIs, NGO workshops). Such a bottom-up approach recognizes the wider need for active community participation in development policies and programs to enable local communities to promote resilience and sustainably manage disaster impacts (Chambers, 1997). The pivotal theme of a bottom-up approach is to engage all respective actors in the policy formulation process. The particular Government departments and ministries will provide a platform where concerned individuals, communities, organisations and other key stakeholders work as a proactive team during formulation of policies. The team members should be invited to participate in every step of policy formulation and implementation processes, and the whole team should make the decision on a course of action.

A bottom-up approach is also needed to provide a space for the local people to advocate their needs and expectations in the policy formulation processes. For the people-centred policies, it is essential to increase direct participation of the vulnerable poor in every level of disaster planning. Even a Government bureaucrat acknowledged this reality and said that the representation of climate-vulnerable people should be included in the policy

formulation and implementation process (c.f Alam et al., 2011, PMIs). On the other hand, policy implementation process should effectively follow the top-down approach (i.e. through central to community level). For example, implementation of post-disaster rehabilitation programs (livelihood support, reconstruction, housing, etc.) should run through national (ministries and departments), regional (division), sub-regional (district), and local (sub-district, Union and village) stakeholders. All these key actors (e.g. from national to local levels) should be involved with support distribution process to make the disaster recovery programs effective. Following the combination of bottom-up and top-down approach in the public policies, sustainable disaster management can be strengthened (Castella et al., 2007).

6.9.3 Reduce corruption of policy-implementing organisations

Both the Government and non-Government policy-implementing organisations (from national to local levels) are involved with corruption (as discussed in section 6.8.4). Lack of good governance (at every stages of addressing disaster), and good coordination (between donors and Government funds), and the excessive interference of bureaucrats and political leaders on disaster management projects, are responsible for corruption (DPIs, meetings with local journalists). The corruption should be reduced through making all DRR activities transparent and accountable. In addition, there is a need for strong monitoring of aid money and increased community participation in the national- and local-level DRR programs.

The development literature on corruption outlines some generic approaches to reducing corruption, such as extra payments to civil servants to increase honesty, increasing national- and local-level monitoring, and public awareness campaigns through engaging civil society members (Mahmud and Prowse, 2012). The Government, NGOs and development partners should work together to reduce corruption.

6.9.4 Strengthening coordination amongst the national and local stakeholders

Coordination amongst the national and local actors should be strengthened through proactive partnerships, regular communication, and coordination meetings. Coordination

is also needed within the disaster management policies and programs. Disaster practitioners, local actors and local communities would help to integrate DRR with prevention, preparedness, response and recovery (PPRR) efforts (Khan and Rahman, 2007). At the local level, an Upazila Nirbahi Officer (UNO, the executive of a sub-district) should emphasise regular coordination and sharing meetings amongst the local actors, which would increase cooperation and help to avoid the repetition of works. At the central level, the national disaster management council would monitor the coordination through improving effective management, strengthening communication, and increasing the level of integration and accountability for every task. The donors, Government, NGOs, and local Government representatives would coordinate the donor-funded activities.

Proactive partnerships are needed amongst the national- and local-level organisations. The disruptive and biased political environment, and lack of accountability and transparency at all levels, result in the absence of effective partnerships among the stakeholders (Khan and Rahman, 2007). An effective public–private partnership can be created through transparent monitoring of DRR activities, amendments in the policies, strengthening institutional capacity, and enhancing civil society roles.

6.10. Conclusion

The purpose of the current study was to explore how social networks are addressed in the disaster policies of Bangladesh, identify gaps between national policies and local-level implementation practices, and recommend for strengthening policies to play a proactive role in disaster resilience and recovery. There were a number of issues found through critical review of major policy documents, from a social capital perspective. These include:

- Existing disaster management and climate change policies of Bangladesh have not adequately focused the local social capital (bonding, bridging and linking) in the context of community vulnerability and their capacity. There is less emphasis on communities' bonding and bridging social networks, and more focus on Governments' linking networks with national organisations, regional forums, and foreign states and donors. Even the post-disaster reports of the Government and

NGOs have not recognised the contribution of local social capital to the recovery trajectories.

- There are some inconsistencies found in the disaster policies that affect the linking social networks to contribute effectively to disaster resilience and recovery in the cyclone-affected coastal villages of Bangladesh. The key problems of the policies are: top-down approach to policy formulation, lack of coordination during policy implementation, faulty practices of recovery support distribution, inappropriate initiative in the policies for mainstreaming disaster risk reduction, corruption of policy implementing authorities, inadequate facilities in the local level linking networks (e.g. community shelter centres), and inappropriate early warning systems. Due to these problems, local communities do not get expected benefits through their linking social networks for disaster risk reduction and climate change adaptation initiatives.

The evidence from this study suggests that there is an urgent need to revise the policy documents in order to prioritise the local social capital and the context of community vulnerability (e.g. physical and financial) and needs (e.g. robust housing, better facilities in the shelter centres, and job opportunities). In addition, a bottom-up approach, could be introduced into the policy formulation process in order to increase the participation of local communities and other key stakeholders. And the policy implementation process should effectively follow the top-down approach (i.e. from central to community level). Providing better benefits to the disaster-affected communities, policy implementing authorities (e.g. national, sub-national and local organisations) should reduce corruption, strengthen inter-organizational coordination, and disseminate credible early warnings.

The findings from this study make several contributions. First, this research will add value to the current literature on social capital and disaster policies and can serve as an example of further studies. Second, the findings are to be useful to Government of Bangladesh when revising existing policies to include local social capital for enhancing local resilience. In this regard, the Government bureaucrats and development professionals will obtain evidence about the status of social capital in the existing disaster policies, and other practical barriers of policy formulation and implementation processes, where capacities of local social capital are ignored. Third, the findings on corruption of policy

implementing authorities would help the civil society organizations for example Transparency International Bangladesh to take necessary steps to reduce corruption.

The current study has only reviewed the major disaster and climate change policies of Bangladesh to explore how social capital is addressed in these policy documents. This paper does not include a comparative analysis, for example, between Bangladesh and India and other subcontinent countries. It would be beneficial for further research to make this comparison, as the socioeconomic conditions, hazards, livelihoods and overall cultural context are almost similar in the South-Asian countries for example, Bangladesh, India, Pakistan, Sri Lanka and Myanmar. Moreover, this study may be a good example for further comparative analysis between developing and developed countries to understand how social capital is addressed in the disaster policies.

Despite the inclusion of significant disaster issues (e.g. disaster risk reduction and climate change adaptation) in the policy documents, they do not adequately address the contribution of social networks to disaster resilience and recovery. This gap is mainly due to use of the top-down approach and a lack of community participation in the policy formulation process. Therefore, policymakers need for a consistent and coherent understanding of the contribution of local social capital to disaster resilience and recovery. Moreover, due to the lack of good governance and political commitment, and massive corruption, these policies have not been implemented effectively. There is need to orient social networks in the policies through community participation and ownership for strengthening risk reduction programs, and promoting community resilience.

Chapter 7-Discussion

This chapter discusses the study findings before reaching a conclusion. It identifies the support necessary for the community to recover from a disaster and critically analyses issues based on the current literature. This chapter outlines how households' social networking relationships (bonding, bridging and linking) contribute to this essential support and also identifies weaknesses in these relationships. It discusses how social capital elements (e.g. norms, trust and networks) are practised in the recovery trajectories through the intervention of bonding, bridging and linking social networks. It briefly focuses on the contribution of other crucial bridging networks (e.g. community leaders) and linking networks (e.g. Faith-Based Organizations (FBOs)) to disaster recovery. This chapter also outlines some limitations within the communities (within the framework of social capital) that affect and limit the overall performance of social capital in contributing to disaster resilience and recovery on the Bangladesh coast. Finally, this chapter concludes with the limitations of this study and suggests further research directions.

7.1 Introduction

The present study was designed to explore the contribution of households' social networks (e.g. bonding, bridging and linking) to disaster resilience and recovery in the two coastal villages of Bangladesh that were severely affected by the devastating Cyclone Sidr in 2007. Social networks are a crucial embodiment of social capital. The concept of social capital used in this study is derived from that given by Bourdieu (1986b), Coleman (1990) and Putnam (1995). This study places emphasis on Putnam's (Putnam, 1995, p. 67) concept of social capital – 'features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit'. Three elements of social capital – social norms (values/practice/reciprocity), trust and networks – were explored in this study.

Social networks are commonly differentiated into three categories based on the types of relationships people have with each other; these are bonding, bridging and linking relationships (Woolcock, 2001). Bonding relationships are, broadly speaking, 'inward-looking' (Patulny and Svendsen, 2007, citing Putnam): they are particularly close relationships. Bridging relationships are outward-looking, 'horizontal' relationships – with similar entities. Linking relationships are 'vertical' relationships – with organisations that have an influence over their circumstances (Nakagawa and Shaw, 2004a). This study understands bonding networks as the households' relationships with immediate family members and other relatives (the in-laws of household heads, and their sons and daughters); bridging networks as the households' relationships with neighbours and friends; and linking networks as the households' relationships with organisations, for example, local government, NGOs and other community-based organizations—CBOs (Chapter 2 & Islam and Walkerden, 2014). The study questions were designed to understand in what instances the bonding, bridging and linking networks contribute strongly and poorly to disaster recovery; how households' asset-based capacities leverage bonding and bridging networks to contribute to disaster resilience and recovery; how social networks are articulated in the disaster management policies of Bangladesh; and finally, the possible opportunities to develop the capacities of social networks for effective contribution to disaster resilience and recovery.

Based on these research questions, this chapter discusses the key research findings, provides an interpretation of the findings, and suggests further research prospects through identifying the limitations of the findings.

7.2 Necessities for post-disaster recovery: an overview of empirical findings

This study examined the various contributions of social networks (bonding, bridging and linking) to disaster resilience and recovery. In particular, this study revealed some important issues of social networks and disaster recovery such as:

- the well and poor performance of social networks;
- the contribution of households' asset-based capital to leveraging bonding and bridging social networks;
- how social networks are addressed in the disaster management policies of Bangladesh; and
- what are the possible opportunities to strengthen the capacities of social networks to contribute more effectively to disaster resilience and recovery.

Based on the findings, this study identified some crucial issues (e.g. food, shelter, health, nutrition and emotional care, cash, household goods, livelihood support, and village infrastructure) relating to disaster recovery in the coastal villages of Bangladesh. This section discusses these key issues in relation to households' social networking relationships and existing literature of social capital and disaster. These are described in the following sections.

7.2.1 Food, water and sanitation

When natural disasters strike, food is a crucial form of emergency support. During and after the disaster, many households do not have enough food in storage and are not able to buy food, therefore they face extreme hardship (Braun and Aßheuer, 2011). After Cyclone Sidr, Bangladeshi coastal villagers received food support from various sources. Disaster victims firstly used their own food sources for survival (households' food through bonding networks), but many households had low food stock due to their limited physical and financial capital. Because of this food shortage, and the uncertainty as to the length of the crisis, household members changed their eating patterns (depended more so on dry foods

like puffed rice, boiled sugarcane juice, bread and cookies), and reduced food intake (the number of meals per day); for example, they ate food twice a day (sometimes only once a day) rather than three times (details in Chapter 2, Section 4.2). Paul and Routray (2010) also found in their study that Bangladeshi flood-affected villagers reduced their daily number of meals and relied on inexpensive food, collected wild food, and depended on relief food. Cyclone-affected household members (bonding networks) sometimes collected floating food and picked up fruits that were transported from crop fields by the surging water. Also, after the cyclone, people took whatever food was available around them, for example, wet rice, bread, sweet potato, pumpkin, green bananas, and coconuts (Alam and Collins, 2010). This study found that some household members who were working in city areas outside the villages also provided food support to the affected households. Affected households also received food support from in-laws (relatives – bonding networks), and neighbours and friends (bridging networks).

The sharing of food during emergencies is a norm and traditional practice in the rural areas of Bangladesh. Braun and Aßheuer (2011) commented that neighbours and relatives are the providers of food during times of crisis. Sakamoto and Yamori (2009) found cooperation and norms of reciprocity within the bridging networks (in local communities) of Java Island. Strong community ties through sharing food, shelter and information were also found in the coastal villages of Tamil Nadu, India, after the Indian Ocean Tsunami (Aldrich, 2012). Strong community cooperation has been evidenced recently after the Nepal earthquake (25 April 2015), where people helped their neighbours through rescue operations, tents (as makeshift shelters), food, and emotional care (Lorch, 2015). This evidence is similar to the existing findings. However, neighbours and friends were able to provide support to each other at the early recovery phase only (up to one month after a disaster). Their capacity to help with longer-term recovery (after a month to several years of a disaster) was limited by their poverty, lack of financial capital and food stock, and their own sufferings from the disaster. Hence, the bonding and bridging social networks (e.g. household members, neighbours and friends) could not provide food support for longer-term recovery in the context. Therefore, affected households had to rely on support from linking networks, for example, NGOs and local government.

Households' linking networks – NGOs and local government (Union Parishad (UP)) – supplied emergency relief to the affected households. They provided food (e.g. rice, flour, cereal, potatoes) and non-food (e.g. drinking water, emergency medicines, and water purification tablets) relief to the disaster-affected villagers of Bangladesh (Household survey, Mallick et al., 2011a, Paul, 2003, Braun and Aßheuer, 2011, Akter and Mallick, 2013). However, the food and non-food relief provided fell short of people's needs, and the supply was irregular due to disruptions in the communication system (Household survey, FGDs, Mallick et al., 2011a). In addition, due to the favouritism and corruption of NGOs and local government, disaster-affected households could not get equitable food support from their linking social networks (Chapter 4 and 5). Besides NGOs and local government could not provide food support immediately after a disaster. Because they need time to reach the affected areas (at least 48-72 hours sometimes more than that) after the disaster (Chapter 4), the local households also suffered for this delay intervention. Households also received community foods through other linking social networks, for example, *longorkhana* (a temporary camp with free food for disaster victims, is organised by the voluntary organizations and personal donation of political leaders and philanthropists) (Household survey, FGDs, Chapter 2 & Islam and Walkerden, 2014).

Households faced a shortage of drinking water and limited healthcare facilities after Cyclone Sidr. These issues directly affected households' capacities to recover from the disaster and occurred water-borne diseases such as dysentery, cholera, diarrhea, skin problems and fever (Household survey, FGDs). Other studies (e.g. Alam and Collins, 2010, Mallick et al., 2011a, Khanom and Salehin, 2012) also found this water shortage in the coastal areas of Bangladesh and the health impacts, which supports the current findings. Households received water from different sources. Immediately after the cyclone, they received water (e.g. bottled water, water purification tablets and *fitkari*) and sanitation (e.g. sanitary latrine) support from NGOs. In the long-term recovery context, NGOs established PSFs (Pond Sand Filters) in the community and provided some logistic support for rainwater harvesting (FGDs, NGO workshop). Local government (Union Parishad) also helped the affected households in many ways. They provided PSFs and sanitary latrines in the communities, dewatered ponds and removed the sludge before the monsoon, and excavated and re-excavated ponds for water with the help of the national

government and national and foreign NGOs (Local KIIs, Meeting with UP staff, & Government of Bangladesh, 2008b).

From a social capital perspective, cyclone-affected households received food support through bonding (household members and other relatives) and bridging networks (neighbours) immediately after a cyclone, and later from the linking social networks (NGOs and local government). For water and sanitation support, they relied significantly on linking networks. In the case of water supply, bonding networks (household members) were only able to help through collecting safe drinking water from distant places (near the marketplace where a few tube-wells were available). Sanitary latrines were repeatedly damaged by cyclones, and it was difficult for the poorer households to replace these as they are costly (FGDs, Case studies). Therefore, local households wanted to receive sanitary latrines as donations from the government and NGOs. Bridging networks assisted through PSFs (in a few cases, people collected water from the PSF of a UP member's house) (Household survey, FGDs).

7.2.2 Shelter

Most of the coastal houses are fragile and of poor quality, as traditionally, most rural houses are made of natural and locally available primary materials (United Nations Development Program (UNDP), 2014, Alam et al., 2013a). This study found three types of dwelling houses in the study villages: *semi-pucca* (floor: mud, brick or cement; walls: bamboo mats, timber, CGI sheet; and roof: CGI sheet); *kutcha* (floor: mud; walls: bamboo, jute stick, straw; and roof: paddy/wheat straw); and *pucca* (floor, walls and roof are made by brick and cement). Alam and Collins (2010) and Paul and Routray (2011b) also found these types of settlements to be vulnerable to cyclones. Most coastal households had *kutcha* and *semi-pucca* houses, which were not strong enough to withstand cyclones (Chapter 2, 3 & Islam and Walkerden, 2014, Paul and Routray, 2011b); therefore, most of the houses in the study villages were destroyed by Cyclone Sidr (Household survey). Cyclone Sidr caused damage to over a million houses that was the largest ever housing damaged by cyclones in the country's history (UNDP, 2014). The villagers received shelter support from various sources. For example, during the cyclone they took shelter in the cyclone shelter centres, and some took shelter in neighbours'

houses (Household survey and FGDs). However, community cyclone shelter centres had less refugee capacity than the population of the study villages, they were located far from the residents (Paul and Rahman, 2006, Alam and Collins, 2010), and communication systems were poor (Islam, 2010). Also, there were limited facilities in the shelter centres for women, adolescent girls and elderly people (Alam and Rahman, 2014); therefore, many villagers were not able or were unwilling to take refuge in these shelter centres. Community members also took shelter (during the disaster) and shared housing (after the disaster) with neighbours (whose houses were comparatively stronger and less damaged) (Paul and Rahman, 2006, Mallick et al., 2011b). Sharing houses with disadvantaged neighbours and friends during crises is a common cultural practice in rural Bangladesh, however, neighbours could not provide long-term shelter support for other neighbours.

Immediately after Cyclone Sidr, some NGOs provided makeshift shelters for the victims. Later, they provided limited building materials to repair partially damaged houses, and new houses to replace the destroyed houses. But this support was significantly less than the community's needs, which implies the limited capacity of NGOs to provide new houses for the cyclone victims (Chapter 4 & Islam and Walkerden, 2015). NGOs' support for reconstruction of housing was also evident after the Orissa Cyclone in 1999 in India (Chhotray and Few, 2012), which is similar to the current study findings. Local government also helped the Sidr victims through shelter, for example, by providing cash and building materials for repairing partially damaged houses, and providing new buildings to replace houses that were destroyed. Paul (2003), in his study, also found that NGOs and local government helped the flood victims to reconstruct or repair their damaged homes. To fix the damaged houses after Cyclone Sidr, households received physical labour from family members, relatives, neighbours and friends. Relatives provided building materials (e.g. bamboo, and occasionally CGI sheets), and collective efficacy/mutual work was carried out amongst neighbours and friends to repair the damaged houses (Household survey). A few households received remittances from their household members who were working outside the villages (e.g. in the city areas, and in a few cases, overseas) (Paul and Routray, 2011b, Islam and Walkerden, 2014).

In addition, NGOs and local government were also involved with reconstruction of village infrastructure, for example, roads, culverts, water sources (e.g. PSFs, ponds),

embankments, and community housing (*abashon*) for the destitute people (Household survey, FGDs, Islam and Walkerden, 2015). Paul (2003) also found that NGOs and government helped flood disaster victims to reconstruct rural infrastructure in the study area, which supports the current findings.

From a social capital perspective, immediately after Sidr (up to 72 hours after the shock) affected households received shelter support from bridging networks (neighbours and friends), and during the cyclone they took shelter in the public cyclone shelter centres (linking social networks). In the early recovery phase (after a week to a month of a disaster), households received support from NGOs (linking social networks) through makeshift shelter. At the longer-term recovery phase (rehabilitation stage—after a month to several years of a disaster), bonding networks (household members and other relatives) helped through providing cash and building materials, however, this support was limited (Chapter 2). Some major housing recovery support was received from linking networks (NGOs and local government), but there were some problems of favouritism and bribery in distributing this support. Therefore, people did not receive fair benefits from their linking social networks, which, in the long run, affects the linking relationships and creates mistrust between the households in the community and between households and organisations (e.g. NGOs and local government).

7.2.3 Emergency medicine, health and emotional care

Climate change-induced disasters such as cyclones have a huge impact on health and healthcare services (Ahsan et al., 2011a, Alam and Collins, 2010, Paul, 2005, Paul and Routray, 2011b). After Cyclone Sidr, households received emergency medicine support mostly from linking social networks. For example, NGOs provided medicine to affected households immediately after the cyclone, and they established temporary medical tents to provide initial support to the disaster victims (FGDs). The Sidr victims also received medical support from many international organisations and foreign states via NGOs and local government (Hutain, 2007, International Federation of Red Cross and Red Crescent (IFRC), 2007, Government of Bangladesh, 2008b). Moreover, national and regional pharmaceutical companies, voluntary medical teams of Medical College students, and many other private companies (e.g. business communities) helped the Sidr victims through

emergency medicine (Case Studies, FGDs, Local KIIs, & NGO workshop). Other studies (e.g. Van Hoving et al., 2010, Jobe, 2011, Pfeiffer, 2003) also showed similar findings regarding emergency medical support from national and foreign NGOs, and pharmaceutical companies after a disaster.

Though the affected households received emergency medicine support immediately after Cyclone Sidr, at the longer-term recovery phase it was difficult for the villagers to obtain healthcare services, as there were no community health clinics in the study villages (FGDs, Local KIIs). Therefore, the villagers had to rely on the *Upazila* (Sub-district) Health Complex that was located a considerable distance from the villages. In these circumstances, the households used to accept medical services from the local pharmacies (FGDs, Case studies & Local KIIs). People sometimes also used local herbal medicines and other treatments to address post-cyclone health problems (Alam and Collins, 2010) through the help and information of bridging social networks (neighbours and friends).

The villagers did not receive adequate treatment benefits from the Union Health Centre due to the absence of doctors and medicines (FGDs). Instead, NGOs' healthcare programs were mostly confined to child and maternity health, and only their microcredit borrowers received this support (FGDs). However, NGOs provided nutritional support for the children (milk and other baby foods), which was useful for babies and appreciated by the villagers (Household survey, FGDs, & Islam and Walkerden, 2015). Paul (2006) also found that NGOs provided health aid to the disaster-affected households. However, this study found nutrition aid for the children as a new support of the linking social capital (e.g. NGOs)

Emotional support is an important factor in the process of disaster recovery. This is needed for the disaster victims as they become traumatised due to damage, loss and shock (Cohen, 2002). The Sidr victims mostly received emotional support from their household members and relatives (bonding networks) for coping with trauma (Household survey, Islam and Walkerden, 2014). This study found that neighbours and friends (bridging networks) also provided emotional and spiritual support (e.g. comforting victims through *milad* – special prayer by Imam), which is similar to the findings of Math et al. (2008). Braun and Aßheuer (2011) also found in their study that neighbours and relatives provide

emotional support, which is sometimes more important than relief goods to overcome the crises. Similarly, NGOs (as the linking social capital) provided post-Sidr psychosocial support to the children through recreational activities (e.g. songs, dance, sports, etc.) in their schools, which helped the children to recover from post-traumatic stress disorder (FGDs, Islam and Walkerden, 2015); because children are usually more psychologically traumatised than adults after a disaster (Choudhury et al., 2006). Other studies (e.g. Cutrona et al., 1986, Madakasira and O'Brien, 1987) reported that both formal support (through organisations – linking social capital) and informal support (through neighbours and friends – bridging social capital) reduces the negative impact of stress on mental health (cf. Paul, 1998b).

From a social capital perspective, households received the majority of their health care support from the linking networks (e.g. NGOs, Union Health Centre and Upazila Health Complex), and a limited amount from bridging networks (local herbal medicine through neighbours and friends). However, emotional care was mostly received from bonding (immediate household members and other relatives), and bridging networks (neighbours and friends, and from community leaders like Imams). This finding is linked to Putnam's discussion, where he mentioned that dense networks (bonding and bridging) provided social and psychological support within households and between community members (Putnam, 2000). However, traumatised children received psychological support from linking networks (e.g. NGOs recreational activities). Enormous emotional support from bonding networks indicates the strong ties, emotional attachment, and trustworthy relationships among the household members and other relatives. Also, bridging networks provide emotional support to each other which, in fact, is a traditional practice in the village areas of Bangladesh.

7.2.4 Household goods

Due to the fragility of the houses, most of the Sidr victims lost their household essentials (Household survey, FGDs). Cyclone Sidr caused enormous damage and loss of household assets (Paul and Routray, 2011b, Haque, 1997). Therefore, support through household goods was an important requirement for disaster recovery. Affected households received household essentials from various networks, with most of the households

receiving this support from NGOs (linking networks). NGOs supported households through providing cooking equipment, bathing buckets, water containers and toiletries. They also received limited support in the form of household goods (e.g. cooking utensils, clothes, etc.) from their in-laws (bonding networks), and some households received support from immediate family members (bonding networks) working outside the villages (Household survey, FGDs). Households did not receive any support in the form of household goods from neighbours and friends (bridging networks); they mostly had to rely on linking networks of national and foreign NGOs to get this support. Haque (1997) found similar results, that the cyclone victims received most important emergency recovery support from national and foreign relief organisations. As a linking network, the Union Parishad (local government unit) did not provide any support in the form of household goods, and bonding and bridging networks had limited financial capacity to support them. However, households received some goods from the voluntary organisations (e.g. social, cultural), educational institutions (e.g. schools, colleges and universities), and other key individuals (e.g. politicians, businessmen and philanthropists) (FGDs).

From a social capital perspective, household members and other relatives (bonding networks) helped through providing household goods due to their strong ties and trustworthy relationships. Neighbours and friends (bridging networks) could not maintain the norm of reciprocal support through household goods due to their lack of financial capital, their poverty, and the disaster impact. Households with strong networks with external organisations received more support in the form of household goods than the households with weak linking networks. Aldrich (2010a) found that communities with more trust, civic engagement, and stronger networks can better bounce back after a crisis than fragmented and isolated ones, which support the current findings. Murphy (1988) found that disaster victims received household goods from both kin (bonding networks) and service agencies (linking networks), which is similar to the current findings.

7.2.5 Cash

Cash is also an important form of recovery support for the disaster-affected households (Chhotray and Few, 2012, Aldrich, 2012), because cash distribution in emergencies has positive impacts on individual and community recovery (Doocy et al., 2006). Households'

annual expenditure in the study villages was higher than their income, so they did not have any savings and had loans from various sources (Household survey, Paul and Routray, 2010). Therefore, households needed cash support after the cyclone. Households received cash support from various sources, for example, family members, relatives and local government (Union Parishad). Household members who were working outside the villages helped through cash as remittance. Relatives (in-laws) also provided cash for rebuilding damaged houses, although that was limited because of their poverty and they were also affected by the cyclone (Household survey). This study found that neighbours and friends could not help each other through cash, although in very few cases they provided loans (with and without interest). Mallick and Vogt (2012) achieved similar findings that cyclone-affected Bangladeshi migrants often borrowed money from friends and neighbours. The Union Parishad helped Sidr-affected households through cash for repairing partially damaged houses.²⁹ NGOs did not provide any cash support, however, they supported through new loans to revive livelihoods after the disaster.

From a social capital perspective, households received cash support from bonding networks (immediate family members and in-laws), and limited cash support through linking networks (Union Parishad). Cash support from bonding networks was less than the needs of the affected households. Bridging networks (neighbours and friends) did not provide any cash support due to their limited financial capital and their own disaster impacts. However, some provided loans within their bridging networks. This discussion implies that disaster-affected households were mostly dependent on external organizations (linking social networks—NGOs, national government, local government, international organizations and business communities) for cash support.

7.2.6 Livelihood assistance

Livelihood support is also an important factor contributing to rehabilitation of the affected households in the longer-term recovery phase. Due to Cyclone Sidr, coastal households lost their livelihood options, for example, crops, poultry, livestock, fishery, trees, boats, nets and fishing accessories (Paul and Routray, 2011b). Households received

²⁹ The Union Parishad supported people through cash as a Government donation for repairing damaged houses. The households with fully and partially damaged houses received Tk. 5,000 (US\$65) and 2,500 (US\$33), respectively.

livelihood support mainly from external organisations such as NGOs and local government (i.e. Union Parishad—linking networks). Mills et al. (2011) found that external aid agencies (national and foreign NGOs i.e. the linking networks) were the major providers of livelihood support to the Tsunami-affected coastal dwellers of Indonesia, which supports the current findings. NGOs provided nets and boats, livestock, poultry, cropping seeds, and microcredit to the affected households (Household survey, Chapter 4 & Islam and Walkerden, 2015). The Union Parishad also provided livelihood support through cropping seeds, nets, and repair costs for boats (Household survey). However, in providing this livelihood support, NGOs and Union Parishad favoured their microcredit borrowers and political partymen, respectively, and were also involved in corruption.

Livelihood support from Union Parishad was less than that from NGOs, and very few households received this support from Union Parishad (Household survey). A possible interpretation of this finding is that the NGOs' emergency management capacity was higher than that of the local government, because NGOs had higher donor support than local government. Another conclusion is that corruption within local government was higher than within NGOs during the distribution of livelihood support; therefore, whatever livelihood-related support they had available to distribute to the affected households was not distributed equally or fairly.

Coastal households' primary occupations are fishing and farming. Fishing equipment and farming land were severely damaged by Cyclone Sidr, therefore, NGOs and local government provided nets, boats and cropping seeds to revive the primary occupations. Alongside fishing and farming, local people desired more emphasis to be placed on the creation of new jobs as alternative livelihood options – for example, fish processing factories, cottage industries, tailoring for women, shipyards, and development of new sea-beaches for tourism – through the direct intervention of NGOs and local government, however, this intervention was lacking. Akter and Mallick (2013) and Mallick et al. (2005) found that local government and NGOs generated employment and income opportunities in the coastal villages after cyclones, however, this was not considerably evident in the study villages of the current research. Very few casual job options from NGOs and local government, such as the reconstruction and maintenance works of roads under the 'cash/food for work' project of the national government and international organisations,

were found during fieldwork in the study villages (NGO workshop, DPIs). Climate change-induced disasters also affect agricultural production as cyclones and storm surges increase soil salinisation (Ahsan et al., 2011a, Ahsan et al., 2011b). Therefore, there is a need to introduce saline-resistant alternative crop varieties in the coastal areas of Bangladesh. Some NGOs were working to popularise the alternative crop varieties in the study villages; local government activities were not found in this regard.

To revive the livelihood activities of the community, NGOs provided microcredit to the Sidr-affected households. However, there were some problems found with microcredit repayment and the high interest rate. These were:

- Households could not repay the loan instalments on time because of their income uncertainties and poverty. Local people said that they could repay loans during the high fishing season (mid-May to mid-October (Bengali month *Joystha* to *Aswin*)) (Household survey, FGDs). After household expenses, sometimes it is difficult for the borrowers to make regular instalments. During a disaster, in particular, when they have less income and face increased expenditure, payment of weekly instalments is difficult (Parvin and Shaw, 2013). The households claimed that NGO workers put pressure on the borrowers to repay and often displayed ruthless behaviour due to being unsuccessful in collecting microcredit instalments on time (FGDs). Haque and Yamao (2008) achieved similar findings – that NGO workers put huge pressure on borrowers to pay their weekly instalments – which supports the current findings. Therefore, people were sometimes scared of NGO workers; hence, on the day of instalment collection, microcredit borrowers normally avoided the NGO workers. One household-head said, “On the day of repayment, I just walk meaninglessly on the road to avoid the collector”. NGO workers occasionally took household goods when borrowers failed to make their repayments. They sold the household goods to the markets in order to receive the instalment amount. A household-head said, “NGO worker took my household utensils [e.g. plates, glasses, and rice cookers], as I failed to refund instalment”. A local key informant said that NGOs have a record of taking household goods and livestock from borrowers when they failed to refund. In fact, NGO workers are also often under pressure from their regional offices to fulfil their target of collecting instalments

from the borrowers; this is why they always keep the pressure on the borrowers to pay on time (NGO workshop). However, NGO workers are concerned about the difficulties of borrows. Therefore, if they miss one/two instalments they usually give them time to refund two/three instalments together. A local key informant (an NGO worker) said that NGO workers only pressured the borrowers when they failed to pay four or five subsequent instalments. One household-head commented that NGO workers usually understand borrowers' good and bad times. If the borrowers miss paying an instalment, they do not force them to pay, rather, they give them additional time to refund. Focus groups commented that although it is difficult to refund microcredit instalments regularly, they are aware that it needs to be repaid regularly, otherwise they will become a defaulter and find it difficult to get another loan. Local people usually rely on loans from NGOs, as they have a lack of alternative loan sources. However, many households had unpleasant experiences with microcredit due to its high interest rate and the pressure to make regular repayments during crises. Due to the tremendous pressure from NGO workers, borrowers often borrow from other sources that have an excessive interest rate in order to refund their initial loan. With the lack of alternative sources to refund the entire loan amount, the borrowers often fall into the problem of additional debt. Thus, the local people never emerge from the vicious cycle of poverty (Haque and Yamao, 2008). This finding is similar to that of Paul and Routray (2011a), who found that Bangladeshi coastal households borrow money simultaneously from multiple sources and use one source to repay another.

- The interest rates of NGO microcredit sources are higher compared to other financial institutions, for example, commercial banks (NGOs workshop, FGDs, Parvin and Shaw, 2013). The NGOs' argument is that to make their operations financially sustainable, they need to charge a high interest rate. This high interest rate, including a strict loan repayment system, creates a major burden for the borrowers. Therefore, the majority of the borrowers demand a reduction in the interest rate and the provision of a monthly instalment repayment system rather than weekly (Parvin and Shaw, 2013, FGDs).

From a social capital perspective, NGOs' and local governments' favouritism and corruption fosters inequality and mistrust between local households and local government leaders, and between local people and NGOs. Moreover, NGOs' misbehaviour and strict rule of collecting microcredit instalments also creates mistrust between NGO workers and borrowers. Thus, the linking networks are often weakened. This malpractice also creates conflict among the community members (between neighbours), which affects the mutual trust and norms of reciprocity. In addition, building capacity of local households is crucial for reducing their dependency on relief of linking social networks and increasing their own resilience. Therefore, alongside fishing and farming, NGOs and local government should emphasis on the creation of new jobs as alternative livelihood options (e.g. fish processing factories, cottage industries, tailoring for women, shipyards, and development of new sea-beaches for tourism). This study expects, through these processes, disaster-affected households would be able to reduce their dependency on the intervention of external organizations (linking social networks) to recover from a disaster.

7.3 How social capital is considered in recovery activities

This study attempted to explore how social capital contributed to disaster recovery after Cyclone Sidr on the Bangladesh coast. In attaining this aim, this study explored various recovery activities that were accomplished through bonding, bridging and linking social networks. This section describes how social capital elements (norms of reciprocity/mutual works/collective efficacy, trust and networks) were considered in the recovery activities in the coastal villages of Bangladesh after Cyclone Sidr. It also discusses how different types of social capital (bonding, bridging and linking) are articulated in the disaster management policies of Bangladesh. In addition, this section presents a brief discussion about the contribution of other bridging social networks (e.g. community leaders) and linking social networks (e.g. FBOs).

7.3.1 Disaster recovery efforts and social capital elements

Trust, norms and networks are the crucial elements of social capital that are practised in coastal villages after disasters, through households' bonding, bridging and linking relationships. Collective efficacy/mutual work is an important community initiative

through which trust, norms and networks can effectively work before, during and immediately after a disaster, and also during the long-term recovery phase (Meyer, 2013). Sampson et al. (1997, p. 918) understood collective efficacy to be ‘social cohesion among neighbours combined with their willingness to intervene on behalf of the common good’. There is a reciprocal relationship within collective efficacy/mutual work (Myers et al., 2004). The collective efficacy was evident in the coastal villages of Bangladesh during and after Cyclone Sidr, where people were involved in a reciprocal relationship. For example, before the cyclone, neighbours helped neighbours (i.e. mutual help within bridging networks) to take shelter in a safer place, and in the aftermath of the cyclone they were involved with search and rescue, sharing of food and information, and mutual works for repairing the damaged houses and boats, preparing the cropping land, and cleaning the debris and fallen trees from the roads and damaged houses (FGDs). Other disaster and social capital studies (e.g. Kaniasty and Norris, 1995, Qu et al., 2009, Sakamoto and Yamori, 2009) also found existence of mutual help (e.g. exchange support, offering refuge, reconstruction, and washing and cleaning, interpersonal contact, and community discussion) among community members during and after disasters.

Collective efficacy is also seen at the household level after a disaster, where household members work together (e.g. repairing damaged houses, nets and boats, and preparing agricultural fields for further cropping) for recovery. The individual contributions of household members promote collective efficacy at the household levels. For example, in one of the study villages, a particular household recovered sooner than other neighbours, as three members (bonding networks) of that household contributed through remittance from three different jobs (two from Chittagong shipyard, and another from Dhaka garment industry). Also, the household-head himself was involved with fishing and farming labour in the village areas. These individual initiatives were transferred into a ‘collective initiative’ that helped the household to recover from the disaster (Case studies). During the emergency, family members (bonding networks) also provided physical labour both at home (to revive the livelihoods and recover from damage and loss) and outside the home (selling physical labour as a day labourer/*rikshaw* puller in the nearby villages or city areas through short-term migration), which was also a contribution to the households’ collective efficacy for recovery. This example implies the strong ties and trustworthiness among household members (i.e. within bonding networks), and it is also a ‘social norm’ that household members work together to recover from a disaster. Paul and Routray

(2011b), and Mallick and Vogt (2012) found similar patterns in their studies involving disasters on the Bangladesh coast.

Mutual work in the community was also organised by the CBOs, for example, clubs and cooperative organisations. In the study villages, several clubs were involved with search and rescue operations immediately after Cyclone Sidr and organised other community members to work together to clean debris from the roads and ponds (FGDs). A local key informant (a club secretary) said, ‘we, the club members, worked hard after Sidr with other community members for sending injured to the hospital, cleaning debris, helping households to fix their houses, and assisting relief provider organisations to distribute relief goods’. Other disaster and social capital research (Nakagawa and Shaw, 2004b, Chamlee-Wright and Storr, 2011) found that social clubs (e.g. youth, sports and cooperatives) helped the community return to normalcy after disasters.

From a social capital perspective, helping each other within the community during times of crisis (through sharing food, shelter, information, and mutual works) is a common social norm and traditional practice in Bangladesh villages. Collective efficacy within the households indicates the strong ties and trustworthy relationships among the household members. Whatever recovery support that households and the community as a whole received from NGOs, local government and other CBOs was as a result of their networking relationships. Thus, the elements of social capital (norms, trust and networks) were practised through the overall recovery activities in the study villages. How social capital elements were practised through bonding, bridging and linking networks in the study villages after a disaster is presented in Table 7.1.

Table 7.1 Practices of social capital elements through bonding, bridging and linking networks

Elements	Theoretical context	Practices in the study villages	How these help resilience and recovery
Trust	Bourdieu (1986) Coleman (1990) Putnam (1995)	There are strong trustworthy relationships between household members and relatives (bonding networks) who provide support through emotional care, foods, labour, and cash to the affected households. Due to mutual trust within households, and between neighbours and friends (bridging networks), they rely on each other during emergencies and receive mutual support through shelter, foods, search and rescue, and cooperative works.	Due to trust and strong ties, family members continue to support the households' recovery process. Neighbours and friends support each other at the early recovery phase. However, in the long-term recovery phase, mistrust is created among them due to conflict and competition to receive external support through linking networks from NGOs and local government.
Norms	Coleman (1990) Putnam (1995)	Change in eating behaviour and reducing food intake by the family members is a common norm/practice during a disaster. Family members' help to the affected households through remittance is also a norm in rural areas of Bangladesh. Sharing shelter, food and information among neighbours, and cooperative works for repairing damaged houses and boats, crop harvesting, and debris cleaning are usual norms of reciprocity. Spiritual support by Imams (through <i>milad</i>) is also a norm in the villages.	The norms of food and remittance support of household members helped households to manage the emergency. However, they had limited capacity to contribute. Local norms of providing community foods through <i>longorkhana</i> , and sharing food through saving <i>musti-chal</i> at the household level were also helpful for initial crisis management.
Networks	Bourdieu (1986) Coleman (1988) Putnam (1995)	Households depend on linking networks, for example, NGOs, local government and other CBOs, for emergency relief, shelter and essential community services.	The households with strong networks with external organisations could recover sooner than the households with fewer networks. After Cyclone Sidr, the households relied on existing linking networks and created new networks with organisations and individuals for long-term recovery and to face future disaster challenges.

Source: Fieldwork data 2013.

7.3.2 Discussion of social capital in the disaster management policies

This study found that despite the importance of social capital in disaster resilience and recovery, households' social networking relationships are not given adequate emphasis in the disaster management policies of Bangladesh. Three policy documents were analysed – the Bangladesh Climate Change Strategy and Action Plan 2009 (Ministry of Environment and Forests (MoEF), 2009), National Plan for Disaster Management 2010-2015 (Disaster

Management Bureau, 2010a), and *Disaster Management Act 2012* (Ministry of Disaster Management and Relief (MoDMR), 2012). This analysis found that linking social networks are given more importance in the policies than bonding and bridging networks (detailed analysis is provided in Chapter 6). Within linking networks, governments' links with various national, regional and international organisations or forums, and foreign states, are given greater priority than the households' links with local and national organisations. Even the post-disaster recovery reports did not acknowledge the contributions of local social capital to the recovery process. Moreover, there is a gap between existing policies and ongoing implementation practices, where community's views and needs are ignored. Therefore, there is a need to revise the government policy documents based on the community's needs and the necessities of households' social networking relationships and their capacities to contribute to the disaster recovery process. Existing social capital and resilience literature (e.g. Cutter et al., 2003, Berke et al., 2008, Aldrich, 2011b) also emphasises the importance of the inclusion of social capital in the disaster management policies, which supports these findings.

7.3.3 *Community leaders as a bridging network*

The community leaders³⁰ (Imams – religious leaders; village headmen – *matobbor*; kinship leaders – *gosthi neta*; and school and madrasa teachers, which are all crucial bridging social networks of local households) are significant individuals in rural areas of Bangladesh (FGDs, DPIs, Haque, 1997, Haque, 1995), because they have social dignity and people usually respect these individuals (FGDs, Local KIIs, DPIs). The relief provider organisations (e.g. national and foreign NGOs) consider them as key individuals at the local level, and Union Parishad representatives also rely on them because of their political connections (DPIs, FGDs). Therefore, as part of the households' bridging social capital, the involvement and contribution of community leaders to post-disaster recovery activities is very significant (Shaw, 2006, Twigg, 2009). Findings of this current study show that at the pre-disaster stage, the political and religious leaders are sometimes criticised that they are working for own interests. However, immediately after a disaster (e.g. up to a week after a disaster), political or religious interests generally do not exist; rather, a more human

³⁰ The community leaders—Imams, village headmen, kinship leaders and school and madrasa teachers, which are all crucial bridging social networks of local households, as they are the neighbours. However, village political leaders are linking social networks, as they are representatives of political parties.

approach emerges. From a humanitarian aspect, these leaders usually work to save lives and properties, irrespective of religion, caste, economic and political boundaries (DPIs). Without any discrimination, they helped people to take shelter in a safer place during the cyclone, they were involved with search and rescue, and provided emotional and food support after the cyclone (FGDs, Kulatunga et al., 2014). They also assisted the relief provider organisations and negotiated/communicated with Union Parishad for recovering essential services in the community (Household survey). However, some community leaders, for example, village headmen and village political leaders, were often involved with corruption and favouritism during the distribution of relief and other recovery support among the cyclone victims (Chapter 5). Also, in the long-term recovery phase, village leaders of a political party (e.g. Bangladesh Jamaat-e-Islami) distributed recovery support among their partymen only (FGDs).

7.3.4 Faith-Based Organizations as linking social networks

Faith-Based Organizations (FBOs – mosques, churches and temples) play a critical role during both the early (emergency response) and long-term recovery phases (restoration period) after a disaster (Koenig, 2006, Vanderford et al., 2007, Yila et al., 2013). In the coastal villages of Bangladesh, as an important FBO, the mosques play a crucial role during and after cyclones – taking shelter in the mosques or other religious establishments is a common norm/practice during such disasters (Chowdhury et al., 1993). This study found that many people took shelter in the mosque during and after Cyclone Sidr (Household survey, FGDs) – some mosque/cyclone shelter centers were seen in the coastal villages during fieldwork (multi-purpose shelter centers, a photo is attached in Appendices). One disaster practitioner mentioned the case of the 1991 cyclone where people of the Ali Akbordia village in Kutubdia, took shelter in the mosques, irrespective of religion and caste. They cooked and took care of their children inside the mosque. The mosques were also involved in the announcement of early warning signals through their microphones (FGDs, Kulatunga et al., 2014). Mallick et al. (2009) also found that people took shelter during Sidr in the religious establishments, for example, mosques, temples and churches in the coastal villages of Bangladesh. The present findings are similar to those of other studies; for example, Minamoto (2010), who found strong relationships between religious organisations and emergency aid during the post-tsunami reconstruction

phase in Sri Lanka. Also, Vanderford et al. (2007) found that many FBOs worked as relief agencies, evacuation centres and volunteer providers to assist other agencies to run recovery activities following Hurricane Katrina in the USA. For example, local churches delivered food and other household items to Hurricane Katrina victims (Vanderford et al., 2007).

However, some contrast findings found from some other studies. For example, Aldrich (2011b) found discrimination due to caste in Tamil Nadu, India, during distribution of relief support after the tsunami. Gill (2007) found that in some villages of India Dalit,³¹ families were forced out of their temporary shelters (e.g. from FBOs), and their children were made to eat in separate locations. In a country, typically inhabited by Muslims like Bangladesh, mosques play a vital role as a linking social network before (broadcast cyclone warning signal), during (providing shelter) and after disasters (organizing special prayer and community meeting) without any discrimination (Islam et al., 2004, Alam and Collins, 2010, Mohit et al., 2014), which is a distinctive character of Bangladeshi culture (Local KIIs, DPIs).

7.4 How various factors limit the contribution of social capital

There are many factors affecting social capital (i.e. bonding, bridging and linking networks). Some of them assist social capital to have a proactive contribution to disaster recovery, while some other factors limit social capital from contributing effectively to disaster resilience and recovery. This section identifies some key issues in the coastal villages that weaken the performance of social capital in disaster resilience and recovery.

7.4.1 Limited livelihood assets

Livelihood asset, is considered an important factor in disaster risk management and resilience (Alexander et al., 2006). Due to the weak asset-based capital of Bangladeshi coastal households – for example, physical capital (land, housing and shelter centres, household assets), financial capital (e.g. limited income, higher expenditure than income,

³¹ Dalit is a designation for a group of people traditionally regarded as untouchable. They are a mixed population, consisting of numerous social groups from all over India. They speak a variety of languages and practice a multitude of religions. There are many different names proposed for defining this group of people, including *panchamas* (fifth varna), and *asprushya* (untouchables).

and lack of savings), and human capital (e.g. low level of education, lack of training facilities on DRR and for further job, limited jobs for the capable working household members) – coastal households could not provide longer-term recovery support to their own family (within the bonding networks) and other affected neighbours and friends (within the bridging networks). Asset-based capital contributes to household income, which significantly strengthens social capital performance (Islam et al., 2011). Therefore, households' recovery capacity depends on the availability of asset-based capital. Aldrich (2011a) argued that social capital can increase other types of capital (e.g. physical, financial and human) through local activities (by bonding and bridging social networks i.e. both at household and community levels) and external interventions (by linking social networks). Therefore, activities of social capital are often considered a 'double-edged sword' (Aldrich and Crook, 2008).

From a natural capital perspective, fishing as an occupation is full of uncertainties due to *jatka* (juvenile size of hilsa) fishing, use of banned nets, attack of pirates, and the injustices of moneylenders (FGDs, Household survey, Local KIIs & Deb, 2009, Islam, 2011). Households can catch fish for only five months of the year, and the rest of the time is often full of hardship. These uncertainties have made fishing insecure and fishermen vulnerable. Moreover, due to saline water intrusion in the cropping land, the coastal people are able to grow only one crop per annum.

These limitations of asset-based capital have weakened the contribution of bonding and bridging networks (detailed discussion is provided in Chapter 3). Therefore, in the case of Cyclone Sidr, bonding and bridging networks could not provide adequate support during the long-term recovery phase, and households relied on the support of linking social networks, for example, NGOs and local government. However, uncertainties surrounding future access to relief support of NGOs and local government was also an important disadvantage for the households, as NGOs and local government were involved with favouritism and corruption during the distribution of relief goods among the disaster victims. Moreover, NGOs and local government also experienced uncertainties, as they were unsure whether they would receive additional recovery support from external donors or the national government.

Due to these limitations, coastal households want more emphasis placed on strengthening their asset-based capital. They believe that strong human capital (e.g. healthy household members, fewer dependent members i.e. disable, sick, and jobless able-bodied family members, a higher number of working members), physical capital (strong housing, sufficient food stock, household assets), and financial capital (multiple sources of income, savings, access to financial institutions) would increase their resilience and help them to avoid dependency on external assistance (Household survey).

7.4.2 Individual interest

Due to conflict between immediate family interest and community interest, people are often deprived of receiving benefits from community resources (that are retrieved through bridging social networks). One disaster practitioner described a case that occurred in the coastal village of Ashashuni Upazila, Satkhira. A pond was dug by a Union Parishad Chairman, and he established a PSF (Pond Sand Filter). Community people were used to collecting drinking and cooking water from that pond. Emerging demands of shrimp cultivation in the region created conflict between the Chairman and his sons; the sons forced the Chairman to cancel the PSF and open the pond for shrimp cultivation. The Chairman could not refuse the demand of his sons, which implies that individual interests sometimes affect bridging social capital and the traditional norms of a certain community (because community people were getting water benefits from that pond as the neighbours of the Chairman). The market value of shrimp motivated the Chairman's family to cultivate shrimp instead of continuing community water supplies. Aldrich and Crook (2008) also found that the market often overlooks the role of social capital.

Some uncertainties in the use of community resources were found in the study villages. For example, people were unable to use some cyclone shelter centres during the cyclone, or community housing (*abashon*) after the cyclone, due to lack of maintenance. Existing literature also indicates that most of the cyclone shelter centres are unusable due to lack of regular maintenance (Dhakal and Mahmood, 2014). Moreover, many villagers did not receive equal benefits from PSFs and were often deprived from using them, as several Union Parishad representatives set up more than one PSFs at their home while other community members did not received one. This study argues that community needs

should be prioritised, rather than simply fulfilling individual interests, in order for community members to get maximum benefits from their bridging and linking social networks.

7.4.3 Inadequate collection of information through linking networks

Various armed forces usually work after a disaster, as the government can deploy different forces for emergency response activities in the distressed areas (Ministry of Disaster Management and Relief (MoDMR), 2012, Chapter 3, Article 30). These armed forces are a crucial linking network of local people. After Cyclone Sidr in 2007, army involvement in emergency management was high, because during Sidr there was no political government in power. An army-backed ‘Caretaker Government’ was ruling the country, and they made significant use of the armed forces in the disaster recovery process. The armed forces sometimes failed to collect appropriate information. For example, army people visited the Sidr-stricken villages and listed the worst-affected households, but they did not consider the households’ recovery capacities – for example, existing households’ resources, the number of income-earning members in the family, and income sources (DPIs). As a consequence, less physical damaged (e.g. housing, livestock, crops, nets and boats) but more vulnerable (less working members, higher dependent members and limited household assets) households were often not included on their list, which led to a disparity amongst the households regarding receipt of government recovery support. Thus, affected households sometimes deprived of the recovery support from linking social capital (e.g. government organizations—GOs).

7.4.4 Inadequate DRR understanding of linking social networks

This study suggests that NGOs should increase their emphasis on disaster risk reduction (DRR) strategies rather than relief-centric activities, because households have a strong preference for empowerment and resilience rather than relief dependency (Household survey, FGDs). However, in the context of the study villages, understanding of DRR of linking social networks (e.g. NGOs, local government and other CBOs) was inadequate (DPIs). Many local NGOs did not understand the distinct response required for cyclones occurring at different times of the year (DPIs); thus, local people were often deprived of

the benefits of linking social networks. A disaster practitioner stated that cyclones occurred during both pre-monsoon and post-monsoon seasons; they are completely different events and require a separate response from the aid agencies. In Bangladesh, most of the cyclones occur during the pre-monsoon (April/May/early June) and post-monsoon (late September/ October/November) periods (Chowdhury, nd); the pre-monsoon stage is the seeding season for *Aus* (autumn rice) and the post-monsoon phase is the harvesting season for *Aman* (winter rice, the largest harvest accounting for more than half of the total annual production) in Bangladesh (Sarker et al., 2014). Hence, the NGO workers, local government officials and other CBOs need to clearly understand the needs of the community and the efforts required if a disaster occurs during seeding or harvesting seasons, as these are crucial for the coastal people. Disaster practitioners and policymakers suggested that there is a need for training program for local NGOs, local government officials and other CBOs to minimise this gap of understanding on DRR and take need-based response based on cyclone occurring times both in the pre-monsoon and post-monsoon seasons.

In addition, there is a limited DRR initiatives found in the activities of linking social networks (e.g. NGOs and local government) than the relief works. NGOs and local government emphasised on post-disaster relief activities rather than DRR, because relief provides significant opportunities for financial irregularities, as the cash flows are much larger than in normal times (Chapter 4 & 5). This limitation weakens the contribution of linking social capital to building resilient community.

7.4.5 Accountability of foreign NGOs and commitment of their workers

Most often, international NGOs are less accountable to the local citizens, local government, and even to the national government of existing working countries, as they are more accountable to their head offices (DPIs, NGO workshop). The lack of accountability of INGOs and their usual dominance to the activities of local NGOs (that are funded by them), sometimes affects the regular activities of local NGOs (NGO workshops). Mallaby (2004) argued that the unaccountable activities of international NGOs to the local populations sometimes hamper the development activities in the global

South³² (cf. Lewis and Opoku-Mensah, 2006). The upwards accountability and domination of INGOs often confined local NGOs' activities to donor-driven agendas rather than to local needs and priorities (Ahmad, 2006).

INGOs sometimes spent more money on their consultants and for travelling in the project areas than on support for the target groups. Bhusal (2004) argued that INGOs allocate a bulk of the funds for the facilities of INGOs' employees and consultants rather than on the program itself designed for the target groups. One disaster practitioner commented that an INGO and a donor organisation hired a helicopter (at the cost of Tk. 40,000 per hour) to visit the Sidr-affected areas, which was less important than helping the survivors. This practitioner advised that if INGOs want to work for vulnerable and poor people, they should travel by common vehicle, mix with the local people, and collect real facts from the field. Bhusal (2004) also suggested that INGOs should reach to the most disadvantaged and marginalized people and bring them into the mainstream of development to promote an equal and just society.

There is also a commitment and status gap evident between national NGO and INGO workers. A disaster practitioner stated that in most cases, the INGO workers are from urban-based rich families (more privileged than rural society), who studied either abroad or in the English medium schools and private universities³³. They have had limited interaction with rural life and have less knowledge about the needs and expectations of villagers. Most of the INGO workers usually visit the village areas for recreational trips and perceived rural life as a tourist. Most of them were not born or brought up in the villages, therefore, they are unaware of local needs. On the contrary, most of the local NGO workers were normally born in the villages and studied there, and they are well aware of the feelings of common people, and understand their needs and expectations. Another disaster practitioner said that the ultimate goal of many INGO workers is not to work in the INGOs for a long time or to be settled permanently in Bangladesh. Rather, they are interested in getting a job in a UN organisation and look for an opportunity to

³² The North–South distribution is broadly considered a socioeconomic and political divide in the world. The Global North includes North America, Western Europe and developed parts of East Asia. The Global South includes Africa, Latin America, and developing Asia.

³³ In the English medium schools and private universities are high-cost educational institutions, where most of the students are coming from urban-based privileged society.

migrate to a developed country. Due to this class distinctiveness, the work of INGOs tends to be market oriented, they are not accountable to anyone, and they take a top-down approach (NGO workshops, DPIs). Davis (2006) understood NGOs' distinct commitment based on their philosophical background, for example, some of them follow democratic/totalitarian/radical approach, and other have a human rights and church-based ethical obligation. Due to this lack of accountability and commitment of INGOs, disaster-affected communities often receive less benefits from their linking social networks, like INGOs and local NGOs (because many national and local NGOs run their recovery activities through the funds of INGOs).

7.4.6 Inequalities in the recovery activities of linking social networks

Both the NGOs and local government were involved with favouritism and corruption during the distribution of recovery support to the Sidr-affected households. NGOs favoured their microcredit borrowers, and local government (e.g. Union Parishad) representatives favoured their political partymen (as they are their potential voters). Mallick et al. (2011a) found that NGOs distribute loan and relief support to their cooperative members only, and the vast majority of affected households are denied any relief support. Mallick and Vogt (2012) also found that after Cyclone Aila, UP members demanded bribes from the victims to provide emergency relief goods and other recovery support. This current study found that alongside favouring the microcredit borrowers, NGO workers often took bribes during the distribution of livelihood support (e.g. livestock, nets and boats). Alternatively, UP representatives favoured their political partymen and took bribes during the distribution of building materials and new houses and livelihood support (e.g. cropping seeds, and nets, and repair costs for boats) (Household survey, Local KIIs, details in Chapter 4 & 5).

There are several reasons behind this favouritism and corruption. NGOs favoured their microcredit borrowers, as they wanted to help them recover so that they could later continue repaying their loans (DPIs, Islam and Walkerden, 2015). One of the potential reasons for NGO workers' involvement with bribery is their job insecurity, as most of the jobs are issue- and project-based. Ahmad (2002) identified job insecurity of NGO workers as a crucial personal problem that affects their working skills and commitments. Due to

this job insecurity, NGO workers often take relief activities as an opportunity to earn extra money (DPIs). In contrast, Union Parishad representatives spent money as an ‘investment’ before an election to gain political power, and used relief and post-disaster rebuilding activities as an opportunity to recover that money and also to save for the next election (DPIs, Local KIIs). Thus, the Cyclone Sidr-affected households were deprived of the equal and fair distribution of relief goods through their linking social networks. These malpractices imply that due to the self-interests of NGO workers and UP representatives, community members are generally deprived of the services of linking social networks, for example, efforts from NGOs and local government.

This study argues that bribes and the uneven distribution of relief support creates conflicts and fosters dissatisfaction, disparity and mistrust between communities and relief provider organisations. The unfair distribution of recovery support exacerbates the disparity, which could further widen, causing damage to peoples’ relationships of trust, and pre-existing social capital (Minamoto, 2010). Mallick and Vogt (2012) found that in the Bangladeshi coastal villages, NGOs’ disparity during post-cyclone relief distribution led many people to migrate to city areas to seek alternative livelihoods. Mahmud and Prowse (2012) also found corruption amongst NGOs and local government in the post-cyclone relief interventions in Bangladesh. This misappropriation of relief works weakens community resilience to risk management, increases conflicts and allows the poor to be deprived (Mallick et al., 2009). These conclusions are consistent with the current study findings, and these issues are hindrances to strengthening community recovery and resilience after a disaster. Relief activities are higher than preparedness measures, and post-disaster relief provides significant opportunities for financial irregularities, as the cash flows (donor support) are relatively large. The emphasis from NGOs on post-disaster relief practices also often fosters relief dependency by local households (FGDs, DPIs, Islam and Walkerden, 2015).

7.4.7 Nexus between social capital and cyclone induced internal migration

As a consequence of frequent cyclones in coastal villages of Bangladesh results in population migration in cities when the households lost their shelters, resources and livelihoods (Mamun Rashid, 2013, Mallick and Vogt, 2012). Internal migration and

households' social networks are interrelated. This study found several pieces of evidence on this issue.

- Bonding social capital (especially household members) sometimes contribute to the households' recovery process through temporary migration in the nearer city areas and sell labour in the markets to support family income (Islam and Walkerden, 2014, section 3.4.4.1 & 7.3.1).
- Income-earning younger members of households, sometimes migrate permanently to big cities (e.g. Dhaka and Chittagong) for a job. They usually send remittance to their families. However, such a condition increases old age insecurity and breaks down the traditional joint family, which affect bonding relationships (Household survey, DPIs, FGDs).
- Migrated people rely heavily on their social networking relationships in the city areas to get job, accommodation and cope with the new environment (Mearns and Norton, 2010, Barnett and Webber, 2010). In this regard, they seek to help their village people/neighbour (bridging networks) and relatives (bonding networks) who migrated before in the same city. They also create new social networks in the city areas with their neighbours and friends, and job provider individuals or organizations (FGDs, DPIs, and NGO workshop).

7.5 Limitations and implications of findings

This study used a social capital framework to explore how households' social networking relationships contribute to disaster resilience and recovery. This study describes the contribution of bonding networks (e.g. immediate household members and in-laws), bridging networks (e.g. neighbours and friends) and linking networks (e.g. NGOs and local government) to disaster resilience and recovery. However, there some limitations to the findings, as follows:

- This study does not provide details of the contribution of other CBOs (e.g. clubs, cooperative organisations, and social and cultural organisations), and FBOs (e.g. mosques and temples) to disaster recovery. This study focused on households'

linking social networks, for example, NGOs and local government, as they made the largest contribution to the recovery process of cyclone-affected coastal households of Bangladesh. However, this study understands the contributions of community- and faith-based organizations to disaster response, and recovery. Their roles are important and well-recognised by the disaster literature as well (Stajura et al., 2012, Joshi, 2010).

- This study does not provide detail information about the contribution of community leaders/civil society members (Imams, teachers, village headmen, village doctors, community volunteers and local journalists), and key individuals (e.g. philanthropists and businessmen). This study has considered the community leaders/ civil society members as the local key informants and received valuable comments on social capitals' contribution to disaster recovery. This study understands their roles in disaster recovery and reducing post-disaster corruption in the Bangladesh coast, civil society's roles is also recognised in the post-earthquake recovery process in Kobe, Japan (Shaw and Goda, 2004).
- This study does not describe the specific needs of women, children and the elderly after a disaster. During household surveys, this study interviewed only household-heads, meaning there is less detailed information about the experience of women, children and elderly of the households because they were not interviewed.
- The fieldwork of this study was carried out after five years of Cyclone Sidr in the two coastal villages of Bangladesh. The memories of interviewees might fade over time, and they may have a different opinion on the contribution of linking social networks such as NGOs and local government to the recovery process, which is a limitation of this study. The current study crosschecked various data sources (e.g. surveys, interviews, focus groups, and workshops) to overcome this limitation. Also, field data was also supported by the existing literature to strengthen the reliability and validity of data. However, memories of disaster affected coastal people do not fade out fully rather refresh due to a frequent attack of cyclones in this region. The study villages have faced several cyclones after Sidr 2007 (e.g. Cyclone Reshmi and Nisha 2008, Aila and Bijli 2009, and Mahasen 2013) which helped households to recall their sufferings and contribution of linking social

networks to their recovery process. Moreover, using retrospective data is a usual practice that is evident in other research works, for example, Mimaki and Shaw (2007) (worked on 2001 flood in Japan, and fieldwork was collected in 2006), and Aldrich (2010b) (examined social capitals contribution to disaster recovery based on the data of Kobe earthquake 1995).

These study findings have several implications in the areas of social capital theory, research and practice.

- These findings are consistent with current theories, as this study used a social capital framework based on the social capital notion of Bourdieu (1986b), Coleman (1990) and Putnam (1995). This study emphasises Putnam's discussion. The findings will add value to existing theoretical knowledge of social capital which explores how the key social capital elements (e.g. trust, norms and networks) are practised through the contribution of bonding, bridging and linking social networks to disaster resilience and recovery in the coastal villages of Bangladesh. The characteristics of typical Bangladeshi coastal villagers (the villagers' outlook is more collective and less individualistic)³⁴, their problems, and the practices of social capital in the post-disaster recovery phase will add new knowledge to Putnam's discussion (as Putnam's social capital discussion is based on an Italian and American context). Moreover, this study revisited the notion of bonding and bridging social capital in the household context of Bangladesh, which is an additional theoretical contribution to the research.
- The findings of the current study provide new insight into social networks, and disaster recovery in the context of a particular hazard (cyclone and storm surge), a particular place (Bangladesh coast), using a particular study approach (mixed methods). The findings show the strengths and weaknesses of social networks in disaster resilience and recovery. This will add value to existing research in the same field, through which the broader research community could discover further research directions. The findings of this study may be a starting point for

³⁴ Sharing shelter, food and information, and mutual works during and after a disaster imply the collective attitudes of coastal villagers, which were common. On the contrary, sometimes the villagers prioritised their individual interests (individualistic attitude) when involved with competition and conflict to get more benefits from the external organisations, however, this was unusual and was not sustained.

researchers to conduct comparative research on social capital and disaster recovery between developing and developed countries.

- The current finding may also assist the practitioner community (e.g. researchers, academics, development professionals and disaster management workers, disaster practitioners, policymakers, planners, donor agents, and government and private sectors) through providing evidence about what is actually happening in the context of social capital and recovery in the cyclone-affected coastal villages of Bangladesh. These findings will help them to establish further policies and actions and conduct research on this topic, as this research describes the strengths and weaknesses of households' social networking capacities, and identifies the needs of the local communities when promoting disaster resilience and recovery.

7.6 Policy directions

The study findings explore some crucial issues, such as: (i) due to limited asset-based capital, bonding networks cannot adequately support the households in the longer-term recovery process; (ii) after the early recovery stage (up to one month after a disaster), bridging networks break down due to competition and conflict to get access to external resources; and (iii) this conflict is created due to the unfair distribution (favouritism and corruption) of relief goods by the NGOs and local government to the disaster victims.

Based on these findings and from a social capital perspective, the following key issues need to be considered:

1. Social change may be an adequate response to corruption and favouritism of NGOs and local government. The local community leaders (teachers, Imams, village headmen, village doctors, community volunteers and local journalists) and FBOs (mosques, temples) need to be included in the activities of Transparency International Bangladesh to take a look at corruption at the local level through being included in the emergency relief and other recovery support distribution processes of NGOs and local government. FBOs and community leaders should be involved in this process as they are aware of the requirements of local people, and

community members have emphasised the importance of the involvement of community leaders in the distribution of recovery support. In some cases, village headmen and village political leaders (who are close to Union Parishad) are involved with corruption and favouritism. However, local people think that if other community leaders (especially Imams and teachers) are involved in the relief distribution process, village headmen and village political leaders would have less opportunity to be corrupt.

2. Significant initiatives are needed to eradicate favouritism and corruption in order to better foster bridging relationships. Bridging relationships break down because of conflict and competition between households over time to obtain utmost benefits from the external organisations after disasters. Community participation in the recovery activities of NGOs and local government would be a significant initiative to combat favouritism and corruption, because local people (both favoured and disfavoured by the NGOs and local government) would place more emphasis on the fair distribution of recovery support. To achieve better outcomes from bridging networks (neighbours and friends) and to better foster bridging relationships, it is essential to minimise the competition and conflict between neighbours. However, it depends on how linking social networks (local government and NGOs) relate to neighbours/households in their recovery activities.
3. Household capacity building is also an important initiative to strengthen the contribution of bonding and bridging networks to disaster resilience and recovery. From a household perspective and considering households' needs, NGOs and local government should take positive initiatives in creating new job opportunities, exploring DRR and vocational training, adopting alternative saline-resistant crops, and providing opportunities for safe fishing in the coastal villages. Empowerment of local households would foster the capacity of bonding and bridging networks to support each other in the longer-term recovery context. Linking networks (e.g. NGOs, local government, civil society organisations, and other local key authorities, are also the priority of 'Sendai Framework for Disaster Risk

Reduction'³⁵) should take the main responsibility for empowering the local households for promoting disaster resilience (United Nations, 2015), as the bonding and bridging networks are the heart of the local community and are the first responders after a disaster (Shaw, 2006). Resonantly, Putnam (2000, p. 23) commented that bonding and bridging social networks establish a kind of 'sociological superglue' (strong in-group devotion where the relationships are tightly knit), whereas linking networks provide a 'sociological lubricant' (through which bonding and bridging networks run smoothly). Putnam indicated the importance of all social networks in society, but emphasised the role of linking networks in providing opportunities to strengthen the capacity of bonding and bridging networks.

4. To strengthen recovery activities and promote resilience, linking networks (NGOs and local government) should use existing human resources. There are many supportive organisations and individuals (e.g., Bangladesh Ansar and VDP, educational institutions, Islamic Foundation, Bangladesh Scouts, Agriculture and Fisheries Departments, Imams, teachers, and other civil society members) available at the local level. For example, if the government can use school teachers in *implementing EPI (Expanded Program on Immunization – the vaccination campaign of the Bangladesh Government) and for conducting an election, it would also be possible to use them in disaster response activities (DPIs)*. The government can use Imams through the Islamic Foundation, as they can help to disseminate DRR information to the community. A disaster practitioner said, 'Imams are the positive source of information dissemination, because, as the religious leaders, people trust and respect them. Therefore, any information disseminated through them is usually accepted by the people'. The support provider organisations can also sustainably use the 'Union Service and Information Centers'. The government

³⁵ Empowering local authorities (key stakeholders), communities, and households with the collaboration of Civil Society Organisations (CSOs), communities and indigenous people for strengthening disaster risk governance is one of the key priorities of 'Sendai Framework for Disaster Risk Reduction 2015-2030'. This framework was adopted by the UN Member States on 18 March 2015 at the third UN World Conference on Disaster Risk Reduction. The conference was held on 14-18 March 2015 in Sendai City, Japan United Nations. Sendai Framework for Disaster Risk Reduction 2015-2030. Third United Nations World Conference on Disaster Risk Reduction, 14-18 March 2015 Sendai, Japan. Autor.

has an adequate amount of competent human resources; it needs to use them appropriately, for example, have the right people in the right places.

5. Based on the above issues, this study suggests that existing disaster management policies should be revised considering the capacities of social networks (bonding, bridging and linking) and the needs of local people, rather than following a top-down approach to formulate and implement these policies.

7.7 Further research agenda

From a social capital perspective and based on the study limitations, overall understanding about the necessities of disaster resilience and recovery, this study suggests some areas for further research. These are as follows.

- Despite these promising results, questions remain on how other CBOs (except NGOs, e.g. social clubs, and cooperative organisations) as the linking social networks of households contribute to disaster resilience and recovery. Further research is needed to know the answer of this question.
- Further research should be undertaken to investigate the contribution of volunteers, social workers, philanthropists, business communities and educational institutions to disaster recovery. This study understands their roles at before and during disaster, and immediately after a disaster (up to a week of after event) and early recovery phase (after a week to a month). Therefore, in order to know their details contribution, further research is needed.
- FBOs are also an important area to research to explore their contribution to the recovery process. This study understands the roles of local community leaders/civil society members in recovery and resilience but does not provide details about their contributions. Therefore, further research is needed on how corruption and favouritism of NGOs and local government can be minimised through the involvement and intervention of Imams, teachers, and other key individuals in the disaster recovery process.

7.8 Conclusion

This study understands that social capital exists in the community and that key social capital elements are practised in the households' recovery activities after a disaster. Therefore, the important questions are: what kind(s) of social capital exists and how do households use it for recovery after a disaster; what are the strengths and weaknesses of social capital; and how can households' networking relationships be developed to contribute effectively to disaster resilience and recovery. Information from fieldwork, interviews, surveys, focus groups and workshops provided evidence of issues and answers to the questions of how bonding, bridging and linking social capital were involved in supporting households to recover following Cyclone Sidr.

This study found both positive and negative consequences of the presence of social capital during the process of disaster recovery. Positive consequences were mutual support, cooperation, trust and institutional effectiveness; negative consequences included sectarianism (e.g. discrimination through favouring own microcredit borrowers by NGOs, and the political partymen by the local government representatives during distribution of relief support) and corruption (during distribution of livelihood support by NGOs and local government). This discussion is linked to Putnam's conclusion of positive and negative manifestation of social capital (Putnam, 2000). Callahan (2005) argued that social capital has its dark side, therefore, 'civil social capital' (e.g. political parties) cannot work neutrally but rather plays a politically biased role to include or exclude a group of people through the 'uncivil social capital' of corruption, ethnocentrism and sectarianism. Rahill et al. (2014) also found evidence of the dual roles (both positive and negative) of social capital (linking social networks) in shelter repair and recovery after the Haiti earthquake. For example, strong linking social capital provided enhanced access to shelter-related resources for those with a connection. On the other hand, it accentuated pre-existing inequalities or created new inequalities among displaced Haitians through favouring and disfavouring. This evidence is consistent with the current study findings, as these issues were found in the study villages in coastal Bangladesh. This study concludes with a recommendation as to how households' bonding, bridging and linking relationships can be strengthened to contribute to disaster resilience and recovery on the Bangladesh coast.

Chapter 8-Conclusion

8.1 Introduction

This chapter summarises the findings of the research, explains the significance of the results and discusses the limitations of the findings. It also outlines recommendations for further research and for practice/policy in order to strengthen the capacity of households' social networking relationships to contribute effectively to disaster resilience and recovery on the Bangladesh coast.

This research is situated at the intersection of two key themes: social capital and cyclone disaster recovery in the rural coastal settlements of Bangladesh. The main goal of the current study was to explore how households' social networks (bonding, bridging and linking) contribute to disaster resilience and recovery. Using a mixed methods approach, this study examined when social networks perform strongly and poorly in disaster resilience and recovery; how households' capital-based assets strengthen the capacities of bonding and bridging social networks; how social networks are articulated in the disaster management policies of Bangladesh; and what opportunities there are to strengthen the capacity of social networks to contribute effectively to disaster resilience and recovery. In addressing these issues, this study used two coastal villages affected by Cyclone Sidr in 2007 as case studies. The empirical data of this thesis was gathered from household surveys, focus groups, key informant interviews, workshops and meetings. This study explored the contribution of bonding social networks (households' relationships with immediate family members and other relatives – in-laws), bridging social networks (households' relationships with neighbours and friends) and linking social networks (households' relationships with organisations – NGOs, local government and other community-based organisations) to disaster resilience and recovery.

The literature review illustrated that social capital is gradually being recognised as a vital issue in the disaster management domain. Therefore, there has been increasing interest among disaster scholars, academics and practitioners in exploring social capital in the context of disaster resilience and recovery (Aldrich, 2010b, Hawkins and Maurer, 2010, Chamlee-Wright and Storr, 2011, Adger, 2003, Nakagawa and Shaw, 2004b,

Jordan, 2015). However, evidence of the contribution of social networks to disaster resilience and recovery is lacking. Disaster studies carried out in the context of Bangladesh have not focused directly on social networks and recovery, and few of them have focused on social capital elements (e.g. norms and networks) as a cross-cutting issue. This lack of empirical research has led to a significant information gap in the data that is necessary for disaster practitioners and policymakers to develop appropriate policies and strategies for disaster recovery and to promote resilience through using local social capital. Considering the climate vulnerability of and frequency of cyclones on the Bangladesh coast, there is a need for further empirical research to explore how local social capital contributes to, and could further contribute to, disaster resilience and recovery. Therefore, this present study conducted in the context of the Bangladesh coast was necessary in order to discover the role of social capital in facilitating households' recovery from cyclones.

This study presented a conceptual discussion of the notion of social capital in the context of disaster resilience and recovery. The conceptual understanding of social capital for this study was derived from that given by Bourdieu (1986b), Coleman (1990) and Putnam (1995), however, emphasises Putnam's definition of social capital: 'features of social life – networks, norms, and trust that enable people to act together more effectively to pursue shared objectives' (Putnam, 1995, p. 67). Following this definition, this study described three key elements of social capital – norms of reciprocity, trust and networks (Putnam, 1995, Woolcock and Narayan, 2000b). Moreover, this study explored how these elements of social capital are practised through households' social networking relationships, for example, bonding, bridging and linking social networks.

Based on discussions in the existing literature on resilience and recovery (e.g. Carpenter, 2013, Folke et al., 2002, Mileti, 1999, Smith and Wenger, 2007), this study defined disaster recovery as the capacity of households and communities to restore households' livelihoods and essential community services after a disaster, and to bounce back to a pre-disaster state. Resilience refers primarily to the ability of households to recover, because this study focused on responses of households' social networks to disasters, and their capacity to contribute effectively to disaster resilience and recovery.

8.2 Summary of the findings

8.2.1 Contribution of bonding social networks: immediate family members and other relatives

Immediate family members provided crucial support to households through emotional support, food, labour, cash, household assets, and information during recovery from Cyclone Sidr (Chapter 2, Section 4.2 & Table 2). All household members received emotional support from other members of their household, which helped them cope with disaster-induced stress. Family members also provided food support to the households – they changed their eating behaviour and reduced food intake during the crisis, for example, they ate food twice a day (sometimes only once a day) rather than three times. Family members provided labour support at home and, through short-term migration, sold labour in the markets to support family income. Because of limited physical and financial capital and poverty, family members were only able to make a very limited contribution to their households' recovery. For female-headed households, recovery was much more difficult due to the various restrictions on women to receive recovery support (from linking networks—external organisations) via bonding networks (Chapter 2, Section 4.2).

Cyclone Sidr-affected households also received support from other relatives (in-laws); for example, emotional support, food, shelter, building materials (e.g. bamboo, CGI sheets, etc.), cash, labour and clothing (Chapter 2, Section 4.3, Figure 2). Affected households received emotional support from family members as a result of their tight-knit relationships. Providing emotional support, in-laws helped to reduce the fear and anxiety of affected households and encouraged them in their recovery efforts. Due to limited assets and income, and the impact of the disaster, the capacity of in-laws was inadequate to support the Sidr-affected households in their longer-term recovery (Chapter 2, Section 4.3).

From a social capital perspective, immediate household members provided continuous support to their family through all phases of recovery (i.e. early recovery phase – up to one month after a disaster; and long-term recovery phase – from one month to several years after a disaster) (Chapter 2, Section 2.5, Table 4). However, limited physical and financial

capital and frequent incidence of cyclones greatly increased their vulnerability and made recovery much more difficult. Instead, relatives (in-laws' households) usually supported their families for up to a month (even if they were affected themselves). After that, they were only able to provide their labour due to their poverty and because they were also affected by the disaster. Despite the limited capacities of immediate family members and other relatives, and existing recovery challenges, bonding networks do not break down, due to their strong ties and trust (Chapter 2, Section 5).

8.2.2 Contribution of bridging social networks: neighbours and friends

During disaster recovery, households exchanged mutual support, for example, search and rescue, sharing of food, water and shelter, cooperative works (e.g. repairing dams and older and damaged houses, clearing debris and cleaning the broken trees from roads), and loans (with and without interest) between neighbours and friends. They did this due to strong community ties and trust (Chapter 2, Section 4.4 & Table 3). Beggs et al. (1996) termed this reciprocal relationship as 'informal insurance' that allows disaster victims to exchange support through financial, physical and logistic means. Neighbours and friends also exchanged emotional support and received spiritual support from Imams through special prayers and comfort. Due to their financial vulnerability, cyclone-affected households were unable to support neighbours and friends with cash (Chapter 2, Table 3); however, neighbours and friends were able to support each other in other ways in the early recovery phase (up to one month after a disaster) (Chapter 2, Section 5 & Table 4). Their capacity to help in the long-term recovery phase (from one month to several years after a disaster) was limited by their poverty, the disaster impacts, and competition and conflict for access to external relief and other recovery support, because recovery support from linking networks is often not distributed fairly to the victims (Chapters 2, 4 and 5). From a social capital perspective, during this time, trust and mutual support decreased significantly, and solidarity in the local communities suffered substantially.

8.2.3 Households' assets: how enable and constrain households' contributions to disaster resilience and recovery

The local community and households are the first responders in the aftermath of a disaster; therefore, households' assets are an important factor in the recovery process. This study discovered that how households' assets (e.g. physical, financial, human and natural) enable and constrain their contributions to disaster resilience and recovery through bonding and bridging social capitals (Chapter 3).

From a physical capital perspective (Chapter 3, Section 3.4.1), most of the coastal houses were not cyclone and storm surge resilient. Consequently, most of them were damaged by Cyclone Sidr, which restricted sharing of shelter within bridging networks (between neighbours and friends). Inadequate cyclone shelter centres, insufficient facilities for women and adolescent girls in the centres, and poor communication systems between residents and shelter centres impeded villagers from obtaining the full benefit of these centres (Chapter 3, Section 3.4.1). The villagers had limited *household assets* (e.g. land, household goods, livestock and poultry) and *productive assets* (e.g. fishing and farming equipment) to enable them to recover from a cyclone. Also, due to poor water and sanitation facilities, people suffered from various diseases, which were not adequately dealt with by the limited healthcare support. This poor physical capital made the coastal households more vulnerable to cyclones and constrained their ability to exchange support within bonding and bridging networks.

From a financial capital perspective (Chapter 3, Section 3.4.2), household income was less than expenditure, which led families to take loans from various sources. Moreover, impacts of frequent cyclones also increased their financial vulnerability. Therefore, households were not able to support each other financially (within the bonding and bridging networks) in the long-term recovery phase. Limited income also impacted on food consumption; consequently, household members could not attain the required food intake (e.g. 2122 kilo-calories per person, per day).

From a human capital perspective (Chapter 3, Section 3.4.3), households in the study villages had fewer working members in the family, and they also had dependent members.

Many households had able-bodied working members, but there is a lack of working opportunities in the villages; therefore, the dependent members were a burden on the family. As a result, household members had limited capacity to support their family (within the bonding networks) to recover from a disaster. In addition, due to the lower level of education in the study villages, most of the household-heads could not find employment outside the villages except fishing and farming. There were also limited training programs on disaster risk reduction (DRR) education and awareness of climate change adaptation (CCA) in the study villages (which are crucial forms of education for human resource development), which affects the development of a disaster- and climate-resilient community.

From a natural capital perspective, there are uncertainties in fishing and farming, which are the primary occupations of Bangladeshi coastal villagers. Coastal people can catch fish only five months a year and the rest of the year means hardship for them when they are involved in other casual jobs, for example, mud cutting as a day labourer, catching small fish and *Kaun* fish, and pulling a *rikshaw* in nearer city areas (through short-term migration) (discussed in detail in Chapter 3, Section 3.4.4). The fishermen usually face some uncertainties, for example, illegal fishing during spawning time, use of banned nets, physical torture by forest robbers and pirates, and exploitation by moneylenders (Chapter 3, Section 3.4.4). These uncertainties make fishing as an occupation quite insecure and vulnerable. There are also uncertainties in farming; for example, due to saline water intrusion into the cropping land, the coastal people can grow only one crop per annum. These uncertainties make coastal people vulnerable and limits their capacity to exchange recovery support within bonding and bridging networks after a disaster.

Due to the limited physical and financial assets of households, and the uncertainties surrounding their natural capital (e.g. fishing opportunities, and productivity of cropping land), coastal households cannot provide longer-term recovery support to their family (within the bonding networks) and other affected neighbours and friends (within the bridging networks).

8.2.4 Contribution of linking social networks: NGOs

NGOs are a crucial linking network of coastal households in Bangladesh. They provided strong support through emergency relief (e.g. food, water and sanitation, medicine, household utensils), shelter (partial building materials, new houses) and livelihood assistance (microcredit, cropping seeds, poultry and livestock, fishing boats and nets) after Cyclone Sidr (Chapter 4, Section 4.2.1, Table 4.2). However, NGOs could not provide these forms of support immediately after the cyclone – they took three to five days to reach the affected areas. Moreover, while providing this support, NGOs usually favoured their microcredit borrowers and sometimes demanded that normal repayments (microcredit instalments) continue during an emergency. Microcredit interest rates were higher than those of commercial banks (details in Chapter 4, Section 4.1), and NGO workers often took bribes during the distribution of livestock to households (Chapter 4, Section 4.2.3 & Table 4.3). Relief provided from NGOs often makes the local people relief dependent (Chapter 4, Section 4.2.7), therefore, this study suggests there is a need for a strategic shift in NGOs' priority from relief provision to more robust DRR activities.

Bribes and the uneven distribution of relief support creates conflict and fosters dissatisfaction and disparity among the households in the villages. This poor practice also creates mistrust between households, and between households and relief provider organisations, which weakens bridging and linking social networks. For example, due to corruption and favouritism, many microcredit borrowers ended their memberships with NGOs (Chapter 4, Section 5.1), which affected linking relationships.

8.2.5 Contribution of linking social networks: local government

Union Parishad (UP), a local government unit, is also a crucial linking network of households in Bangladesh. UP provided recovery support to the affected communities through emergency relief goods (food, water and medicine), shelter (cash and building materials for repairing partially damaged houses, and providing new buildings to replace houses that were destroyed), and livelihood assistance (seeds for crops, and funds to repair or replace fishing boats and nets). UP also rebuilt major community infrastructure, for example, roads, culverts, and water and sanitation facilities (Chapter 5, Section 5.4 &

Table 5.1). However, while providing this support, UP representatives sometimes took bribes and favoured their political partymen. Due to this corruption and favouritism, the Union Disaster Management Committee (UDMC) failed to perform well; it was largely inactive (details are in Chapter 5, Section 5.4.4). This study identified various factors behind the weak performance of UP after a disaster. These included abuse of political power and exchange of bribes, lack of financial and logistic support in the UP, lack of communication between UP representatives and the community, lack of collaboration with NGOs and other community-based organisations (CBOs), and uncertainties surrounding receiving relief/recovery support from government and foreign donors (Chapter 5, Section 5.5). From a social capital perspective, such malpractice fostered inequality and mistrust between local households in the community, and between households and local government leaders. This malpractice also affects the norms of reciprocity of bridging networks and linking networks in the long run.

8.2.6 How social capital is addressed in the disaster policies of Bangladesh

Existing disaster management policies of Bangladesh have not adequately focused on local social networks (bonding, bridging and linking); however, linking social networks are given greater focus in the policies than bonding and bridging networks (Chapter 6). The disaster policies have focused on government's links with various national, regional and international organisations and foreign states, while households' links with local and national organisations have been given less importance. Even post-disaster government reports have not acknowledged the contribution of local social capital to the recovery process. Moreover, there is a gap between the existing policy formulation process and ongoing implementation practices, where community's views, local needs, and their participation are ignored. This study suggests that policy documents should be revised based on the community's needs (e.g. more robust housing, better facilities in the shelter centres, and enhanced job opportunities) and capacities (e.g. physical and financial) of households' social networking relationships to contribute to the disaster recovery process (Chapter 6, Section 6.10).

Cyclone-affected communities (both the bonding and bridging networks) have not received sufficient support from their linking networks, for example, from NGOs and local

government (Chapters 4 and 5). The existing top-down approach to policy formulation, lack of coordination among the implementing organisations, favouritism and corruption are the major problems of linking networks that impede them from providing fair and equal support to the disaster victims (Chapters 4, 5 and 6).

8.3 Significance of the findings

The findings from this study have several implications. First, from a broader conceptual perspective, this study builds a case in the domain of ‘coastal disaster management’. This study uses a social capital framework that integrates the contribution of bonding, bridging and linking social networks to recovery from a cyclone disaster on the Bangladesh coast. Recognising the importance of social capital in disaster resilience and recovery, this study provides evidence of how household members and relatives (bonding social networks), neighbours and friends (bridging social networks), and NGOs and local government (linking social networks) perform well and poorly in disaster resilience and recovery in the rural villages on the Bangladesh coast. Therefore, this research contributes to existing knowledge and to further conceptualisation of social capital, disaster resilience and recovery. This study has revisited the notion of *bonding and bridging* social capital (details are in Chapter 2, Section 2.2) – rather than following the conventional understanding provided by the theorists and existing literature – and provides a distinct contribution to the social capital theory. This thesis illustrates how the lack of *household assets* weakens the contributions of households through bonding and bridging social capital, and how favouritism and corruption limit the contribution of *linking social networks* to disaster resilience and recovery. This study also offers an account of how social capital elements (e.g. norms, trust and networks) are practised through the social capital framework after a cyclone (particular hazard) on the Bangladesh coast (particular place). This experience adds considerable value to the concept and fills the gaps in the limited literature in the field of social capital and disaster, both in Bangladesh and the Indian sub-continent.

Second, these findings are also useful in a policy context. This study discovered that social capital is not adequately addressed in the disaster management policies of Bangladesh. Existing policy documents have given priority to government’s linking

relationships with foreign states and donor agents rather than households' linking relationships with organisations; also, bonding and bridging social networks have not been given adequate attention in the government's disaster policies. Consequently, methods of increasing household capacities (both bonding and bridging networks) are not sufficiently addressed in the disaster recovery programs of national government.

Therefore, strengthening the capacities of bonding and bridging networks (i.e. local households and communities) is crucial for disaster recovery, as households and the community (bonding and bridging networks) are the first responders after a disaster (Shaw, 2006). These findings will help policymakers, development practitioners, and other concerned stakeholders to develop more robust policies, programs and actions in order to strengthen the capacities of local social networks to contribute effectively to disaster resilience and recovery (Chapter 1, Section 1.10.2).

Third, the findings are useful for both researchers and research participants. This study can serve as a base for future researchers who wish to conduct comparative studies between developing and developed countries, on the contribution of social capital to disaster recovery. In addition, these findings can also contribute to the broader interest of study participants (e.g. the villagers). The coastal villagers of Bangladesh will benefit when the government, NGOs and other stakeholders develop further policies and programs based on these findings, as the key findings of this study will be shared with Bangladeshi key stakeholders, for example, NGOs (through providing precise findings in the Bengali language), and government policymakers and allied departments (Department of Disaster Management, and Ministries) (discussed in Chapter 1, Section 1.10.3). These findings will also benefit international communities (foreign states, and donor agencies), as the study findings have already been published in international journals and presented at international conferences. International communities can take into consideration the findings as they develop further disaster resilience and climate change adaptation programs (Chapter 1, Section 1.10.3).

Fourth, the empirical findings could help to generalise the overall recovery and resilience conditions of coastal villages in Bangladesh, because the natural hazards, households' vulnerabilities, socioeconomic characteristics of the villages, and the

capacities of social networks (bonding, bridging and linking) are very similar in this region. In addition, the experience of poor coastal villages will also be useful in the contexts of other countries (e.g. India, Myanmar, and Sri Lanka) who face similar disasters to the Bangladesh coast.

8.4 Limitations of the current study and recommendations for further research

Through a social capital framework, this study explored the contribution of bonding, bridging and linking social networks to disaster resilience and recovery; however, this study identified some grey areas that could be given greater attention in future research. The current research gaps and potential research areas are outlined in the following paragraphs.

- During the survey, researchers interviewed only the household-heads in their homes, and on most occasions other household members were part of the conversation and contributed additional insights (Chapter 2, Section 3). Women, children and the elderly-specific needs and their experience are crucial for recovery as they are the most vulnerable groups during disasters (Chapter 2, Hoffman, 2009). However, the findings presented in this thesis do not provide detailed information about the experiences and needs of these particularly vulnerable household members after a cyclone, because this study did not explore the needs and contributions of *individual* household members within the bonding and bridging networks; rather, it considered the household as a unit and described its contribution to disaster resilience and recovery. This gap can be addressed in further research examining detailed information on the specific needs of women, children and the elderly and how they promote or constrain the households' recovery after a disaster. In addition, this study realises the findings along the Bangladesh coast based on two study villages. Although the hazards, vulnerabilities, socioeconomic characteristics of the villages, and the capacities of social networks (bonding, bridging and linking) are very similar in this region (Alam and Rahman, 2014, Islam and Walkerden, 2015), further research can investigate the contribution of households' social networks to disaster resilience and recovery using a larger sample.

- This thesis focused on social networking relationships in the context of coastal households, where households' linking relationships with NGOs and local government were explored. The findings do not provide detailed information about the linking relationships between national and international NGOs, and local and national government. Wider linking relationships could be investigated, and this would be useful because broader links of local NGOs and local government with national and international organisations can increase their capacities to contribute effectively to disaster resilience and recovery. Further research could investigate these linking networks. Moreover, this study used the *social capital framework*, which is not the only way to look at households' relationships in recovery trajectories. There is also an *economic framework* for looking at social life and the disaster recovery process; this is a helpful framework in the area of policy dialogue, as many of the decision makers emphasise economic values and there is also a rich research tradition of focusing on an economic framework to understand disaster resilience and recovery (Chapter 1, Section 1.11). Hence, there is need for further research to investigate how economic capital strengthens social capital to promote disaster resilience and recovery.

- In the context of linking social networks, this study only focused on the contribution of NGOs and local government. It does not provide details of the contribution of other CBOs, for example, clubs, cooperative organisations, social and cultural organisations, and Faith-Based Organisations (FBOs, mainly religious institutes – for example, mosques and temples) to disaster recovery. The FBOs play an important role during both the early (emergency response) and long-term recovery phases (restoration period) after a disaster (Chapter 7, Section 7.3.4). There is, therefore, a need for a more detailed investigation to discover how other CBOs (except NGOs) and FBOs contribute to disaster resilience and recovery. Moreover, another possible research area is how FBOs can be effectively used in the recovery process to minimise favouritism and corruption during the distribution of emergency relief and other recovery support.

- In the context of bridging social networks, this study explored the contribution of neighbours and friends to the disaster recovery process (Chapter 2). This thesis

does not provide details about the contribution of other important bridging networks, such as community leaders/civil society members (Imams, teachers, village headmen, village doctors, community volunteers and local journalists), and other key individuals (philanthropists and businessmen) to disaster recovery following a cyclone. This study understood the importance of these key individuals in the recovery process but found little information on this as the cross-cutting issue (Chapter 5). This study interviewed these key individuals (community leaders/civil society members) as the local key informants whose views (on the contribution of local social capital to disaster recovery) are reflected in this thesis (Chapters 2 to 5). Moreover, during Disaster Practitioner Interviews (DPIs), a question was asked about the contribution of local civil society members to disaster resilience and recovery, and little information was gathered. Therefore, further research could be undertaken to investigate the detailed contribution of those key individuals/professionals to recovery activities after a disaster.

- This study understood the importance of collaboration amongst the linking networks (i.e. between the organisations), and between linking networks and the local community (bonding and bridging networks). This study considered the relationship between local government and NGOs, and coordination amongst them. The findings also identified that due to the lack of coordination amongst the NGOs and local government (within linking social networks), coastal households were deprived of the utmost recovery benefits (Chapters 4 and 5). Therefore, a valid question may be raised in further research about how this collaboration and coordination can be strengthened, and how international donors and national government can intervene in this regard.

8.5 Recommendations for policy

This study understands the importance of bonding, bridging and linking social capital in disaster resilience and recovery in the coastal villages of Bangladesh. It also identifies the limitations of local social capital that affect its ability to achieve recovery goals through bonding, bridging and linking social networks. Therefore, local social capital has to be incorporated within the framework of policy reforms, including in the coastal planning, programs and infrastructure designs. The policy reforms, plans and programs should take

into consideration the likely impacts of extreme climate events (e.g. cyclones, storm surges and salinity, etc.) and building resilience and recovery in the rural coastal settings in Bangladesh. From the analysis of the findings, this study develops a variety of recommendations to strengthen the contributions of bonding, bridging and linking social networks to disaster resilience and recovery. These recommendations are relevant to both local NGOs and local government who have direct roles, and to central government and national and foreign NGOs who support local actors through formulating policies, providing funds and technical support, and designing new programs.

This study regards *households' capacity building* as the prime initiative to strengthen the capacity of bonding and bridging social capital. Some *procedural changes* are required to reduce corruption and strengthen the capacity of linking social capital. The initiatives below are recommended to be undertaken in order to build household capacity, strengthen local social networks and promote resilience and recovery.

8.5.1 Employment generation

Increasing local employment is necessary to improve households' resilience. Coastal households have on average one person unemployed (Chapter 2, Section 4.1), so expanding local employment could make a substantial contribution to households' disaster resilience. Some of the possible opportunities, which were identified as employment opportunities by the villagers, are: establishing fish processing factories, shipyards, and development of new sea-beaches. Moreover, involving women in income-generating activities (IGAs) – for example, tailoring, sewing work, poultry rearing and cottage industries – is crucial. The Government of Bangladesh and national and foreign NGOs can help through providing interest-free loans/donations for small projects to increase these IGAs. These alternative income options will strengthen the capacity of local households and substantially reduce their dependency on external organisations (the linking social networks) during the disaster recovery process.

8.5.2 Strengthening security of existing livelihoods

It is essential to secure the existing livelihood options (fishing and farming) in order to improve the self-sufficiency of coastal households. Because of the frequency of cyclones, illegal fishing, use of banned nets, physical torture by forest robbers and pirates, and exploitation by moneylenders, fishermen cannot catch fish throughout the year (Chapter 3, Section 3.4.4). In addition, due to saline water intrusion into the cropping land, the coastal people are able to grow only one crop per annum (Chapter 2, section 2.4.1; and Chapter 4, section 4.4.1, & Islam and Walkerden, 2014). These uncertainties make coastal people vulnerable in ways that limit the capacity of bonding and bridging social networks. To secure the existing livelihoods and reduce the uncertainties, some measures can be taken. These include:

- Local government, the Upazila Fisheries Office and NGOs should collaborate and take action through law-enforcing agents (local police and coastguards) to stop illegal fishing and strengthen the security of fishermen. Moreover, the national government should provide interest-free/low-interest loans for fishermen so they can avoid having to take loans from moneylenders, as the moneylenders usually take advantage of fishermen in this situation – fishermen are often obligated to sell their catch to moneylenders who set the fish price at, on average, 10–20% lower than actual market prices (Chapter 4, Section 4.1).
- Local government should support local people for multiple uses of farming land through alternative crops (rather than just rice, e.g. sunflower, watermelon, potato, etc.) and through adopting saline-resilient crop varieties. The national government and national and foreign NGOs could provide cash, seeds and technical support for alternative farming practices (Chapter 2, Section 6; Chapter 4, Section 4.1).

8.5.3 Providing robust housing

To leverage households' capacities for recovery and to build local resilience, it is essential to provide support for construction of more robust housing in the coastal villages. Most of the coastal houses are semi-*pucca* and *kutchha*, which are not cyclone and storm surge resilient (as discussed in Chapter 2, Section 4.1). Moreover, many people cannot take refuge in the cyclone shelter centres due to insufficient shelter centres, lack of a

gender-friendly environment in the centres, and unsuitable communication systems (both roads and vehicles) between residents and shelter centres (Chapter 3, Section 3.4.1.1). Also, some local people hold the belief that they should not vacate their home during a disaster for fear of misfortune (Chapter 3, Section 3.5.1). Therefore, strong housing is needed for the coastal households, which would help to minimise damage and loss. The government, in collaboration with national and foreign NGOs and donors, can provide stronger housing (two-storey buildings – *pucca* houses) to the local people through long-term, interest-free loans (Chapter 3, Section 3.5.1).

8.5.4 Decreasing conflict within bridging networks

Reducing competition and conflict between neighbours and friends (within the bridging social networks) is also an important initiative for effective engagement of bridging networks in the recovery process (Chapter 2, Section 4.4). This conflict often develops due to unfair distribution of support from linking social networks (e.g. NGOs and local government) during the long-term recovery phase. Due to this conflict, the norms of reciprocity decline in the longer-term recovery phase and mistrust is created between households in the community. Two major initiatives are needed to reduce this conflict and competition:

- significantly improving the transparency of support distribution through providing better information on relief packages to disaster victims, and
- markedly increasing community participation in the support distribution process.

8.5.5 Reducing corruption of linking social networks

The linking social networks (both NGOs and local government) are involved with post-disaster corruption during the distribution of emergency relief and other recovery support (Chapter 4, Section 4.2.5; Chapter 5, Section 5.4.3). Favouritism and corruption by NGOs and local government (linking social networks) creates mistrust (i.e. vertical mistrust between households and horizontal mistrust between households and organisations) in the community, which is similar to the social capital discussion of Fukuyama (2001). Procedural changes are needed for reducing corruption and improving the contribution of these linking social networks. These changes are: fair distribution of relief goods and community participation in the relief distribution process (Chapter 4, Section 5.1); in

particular, involving community leaders (e.g. Imams, village-headmen, and school and madrasa teachers) in relief distribution activities (Chapter 5, Section 5.6.1). They can play key roles at the local level, and civil society organisations (CSOs), such as Transparency International Bangladesh, can play a key role at the national level by developing programs to raise awareness of corruption and its implications at the local level.

8.5.6 Prioritising disaster risk reduction rather than focusing on relief

Disaster risk reduction (DRR) activities should be prioritised, as these are crucial for creating community resilience. Both NGOs and local government should divert from their aid-centric activities (e.g. simply distribution of relief goods). NGOs and local government mostly focus on post-disaster relief activities rather than DRR activities (pre-disaster prevention and preparedness) (Chapter 4, Section 4.2.5; Chapter 5, Section 5.6.3), often because relief work provides significant opportunities for financial irregularities, as the cash flows (donor support) are much larger than in normal times and relief interventions are particularly prone to corruption (Chapter 4, Section 4.2.5, & Chapter 5, Section 5.4.1 and 5.6.3, Mahmud and Prowse, 2012). This relief priority of linking social networks (NGOs and local government) often fosters relief dependency of local people (Chapter 4, Section 4.2.7). Therefore, DRR activities are needed for promoting community resilience.

8.5.7 Considering the contribution of social capital in disaster policies

Local social capital is considered ‘social insurance’ (Beggs et al., 1996) for the disaster-affected people, because households’ social networking relationships (especially bonding and bridging networks) significantly help each other after a disaster (as discussed in Chapter 6, Section 6.7.3). Bonding and bridging networks are the first responders after a disaster (Shaw, 2006), however, existing disaster management and climate change policies of Bangladesh have not adequately addressed local social networks. The policy documents have focused less on households’ bonding and bridging networks and more on government’s linking relationships with national organisations, regional forums, and foreign states and donors (Chapter 6, Section 6.7.2). Even post-disaster recovery reports of government do not acknowledge the contribution of local social capital to the recovery

process (Chapter 6, Section 6.7.3). Therefore, disaster management policies of Bangladesh need to recognise the contribution of social capital to disaster resilience and recovery.

In summary, this study demonstrates how households' social networks (bonding, bridging and linking) contribute to disaster resilience and recovery on the Bangladesh coast. This study shows that bonding networks (immediate family members and other relatives – in-laws) cannot provide adequate support to the households at the longer-term recovery phase (from one month to several years after a disaster) due to their limited physical, financial and human capital, uncertainties of natural capital (fishing and farming), poverty, and their own disaster impacts. However, bonding networks do not break down; rather, they continue to support households. Instead, bridging networks (neighbours and friends) provide support only at the early recovery phase (up to one month after a cyclone) and cannot continue their support in the longer-term recovery phase due to their poverty and coping with their own disaster impacts. Finally, bridging networks break down due to conflict and competition over access to external resources (emergency relief and other recovery support) from linking social networks (NGOs and local government). This study also argues that linking social networks do not provide recovery support equitably to cyclone-affected households due to the existence of favouritism and corruption. These weaknesses of bonding and bridging networks, and poor practices of linking social networks, affect the key social capital elements such as norms of reciprocity (declines after a certain period after a disaster), trust (creates mistrust between households, and between households and organisations), and networks (due to corruption and favouritism microcredit borrowers often ended their membership with few NGOs, which affects linking relationships). Moreover, this thesis argues that social networks are not adequately articulated in government disaster management policies, which affects the government's plans and programs to develop the capacities of local social capital to face the upcoming disaster challenges and promote resilience among communities on the Bangladesh coast.

This research is an empirical example, which shows how social capital translates into action in the face of an extreme climate event (e.g. cyclones and storm surges). This study suggests that for the effective contribution of bonding and bridging networks to disaster resilience and recovery, households' capacities should be strengthened through creating

alternative job opportunities and securing existing livelihoods (e.g. fishing and farming). Linking networks should improve their transparency, providing fair and even distribution of emergency relief and other recovery support to the cyclone-affected households, and DRR activities rather than aid-centric relief works should be emphasised. Building resilient communities is possible through increasing the capacities of local households by the direct interventions of linking social networks (e.g. NGOs, local government and other CBOs). These capacity-building processes can substantially reduce the recovery role of linking social capital in facing future disaster challenges. Thus, local households would reduce their dependency on organisational support after a disaster.

References

Note: This list refers to chapters 1, 3 and 5 to 8, as the chapter 2 and 4 are the published papers which contain their reference lists with them.

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Appendices

Appendix-A: Consent form



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Chief Investigator's /Supervisor's Name: Dr Greg Walkerden
Chief Investigator's /Supervisor's Title: Lecturer in Environmental Management

Information and Consent Form

(For Household Survey)

Name of Project: How effectively are social networks using their capacities in disaster resilience and recovery? A case study from the Bangladesh coast

You are invited to participate in a study of 'how effectively are social networks using their capacities in disaster resilience and recovery'? The purpose of the study is to know the contribution of community's bonding (family), bridging (neighbours and friends) and linking (organizations) networking relationships in disaster resilience and recovery in the disaster affected coastal areas of Bangladesh. The study desires to know the community peoples' opinions on the effectiveness of social networks in disaster resilience and recovery, when and why do the linking relationships (organizations) work strongly and poorly, how the linking relationships can be improved in regarding disaster resilience and recovery.

The study is being conducted by Dr Greg Walkerden (chief investigator), Department of Environment and Geography, Lecturer in Environmental Management, phone: +61(0)2 9850-7991, email: greg.walkerden@mq.edu.au and Md. Rabiul Islam, PhD candidate, Department of Environment and Geography, phone: +61(0)2 9850-7985, email: md-rabiul.islam@students.mq.edu.au as being conducted to meet the requirements of PhD degree under the supervision of Dr Greg Walkerden.

If you decide to participate, you will be asked to number of questions relating to contribution of social networks (family members, neighbours and friends, and organizations) in disaster resilience and post-cyclone recovery. We have a structured (Bengali version) questionnaire for household survey. You are requested to give the answer all of the questions based on your perception and understanding from your coastal life experiences. You are also requested to give your opinion

about community needs and requirements for building resilience and promoting post-disaster recovery activities.

In the interview session, you need to occupy 3-4 hours and you will loss a day to work. Therefore, you will be paid BDT800=\$10 as the equivalent salary of a day labourer of the study area.

Any information or personal details gathered in the course of the study are confidential. We will use some quotes in conference presentations or publications such as journal articles and book-chapters. We will quote your comments and opinions as the broader views of community. No individuals will be identified in any of our publications or presentations. Only the research supervisor (the chief investigator) and PhD candidate (co-investigator) will have access to data. A summary of the study findings will be made available for the participants through sharing meeting with local NGO's, writing text book/book chapters and presenting the study findings in the national conferences.

Participation in this study is entirely voluntary. The participants are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence.

I, (*participant's name*) have read (*or, where appropriate, have had read to me*) and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name: _____

(Block letters)

Participant's Signature: _____ Date: _____

Investigator's Name: MD. RABIUL ISLAM

(Block letters)

Investigator's Signature: _____ Date: _____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone +61(02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome. You can also contact Dr Jakir Hossain, phone: +88 01711 308 723, email: jakir1034@yahoo.co.uk, Executive Director, Development Synergy Institute, if you have any ethical concern re this study.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)



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Chief Investigator's /Supervisor's Name: Dr Greg Walkerden
Chief Investigator's /Supervisor's Title: Lecturer in Environmental Management

Information and Consent Form

(For Focus Group)

Name of Project: How effectively are social networks using their capacities in disaster resilience and recovery? A case study from the Bangladesh coast

You are invited to participate in a study of 'how effectively are social networks using their capacities in disaster resilience and recovery'? The purpose of the study is to know the contribution of community's bonding (family), bridging (neighbours and friends) and linking (organizations) networking relationships in disaster resilience and recovery in the disaster affected coastal areas of Bangladesh. The study desires to know the community peoples' opinions on the effectiveness of social networks in disaster resilience and recovery, when and why do the linking relationships (organizations) work strongly and poorly, how the linking relationships can be improved in regarding disaster resilience and recovery.

The study is being conducted by Dr Greg Walkerden (chief investigator), Department of Environment and Geography, Lecturer in Environmental Management, phone: +61(0)2 9850-7991, email: greg.walkerden@mq.edu.au and Md. Rabiul Islam, PhD candidate, Department of Environment and Geography, phone: +61(0)2 9850-7985, email: md-rabiul.islam@students.mq.edu.au as being conducted to meet the requirements of PhD degree under the supervision of Dr Greg Walkerden.

If you decide to participate, you will be involved in a group discussion based on number of issues relating to contribution of social networks (family members, neighbours and friends, and organizations) in disaster resilience and post-cyclone recovery. We have an open-ended (Bengali version) checklist for focus group discussion. You are requested to continue the discussion following this checklist. You will discuss based on your perception and understanding from your coastal life experiences. You are also requested to focus on community needs and requirements for building resilience and promoting post-disaster recovery activities. In the discussion session, you need to occupy 2-3 hours.

Any information or personal details gathered in the course of the study are confidential. We will use some quotes in conference presentations or publications such as journal articles and book-chapters. We will quote your comments and opinions as the broader views of community. No individuals will be identified in any of our publications or presentations. Only the research supervisor (the chief investigator) and PhD candidate (co-investigator) will have access to data. A summary of the study findings will be made available for the participants through sharing meeting with local NGO's, writing text book/book chapters and presenting the study findings in the national conferences.

Participation in this study is entirely voluntary. The participants are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence.

I, (*participant's name*) have read (*or, where appropriate, have had read to me*) and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name: _____

(Block letters)

Participant's Signature: _____ Date: _____

Investigator's Name: MD. RABIUL ISLAM

(Block letters)

Investigator's Signature: _____ Date: _____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone +61(02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome. You can also contact Dr. Jakir Hossain, phone: +88 01711 308 723, email: jakir1034@yahoo.co.uk, Executive Director, Development Synergy Institute, if you have any ethical concern re this study.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)



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Chief Investigator's /Supervisor's Name: Dr Greg Walkerden
Chief Investigator's /Supervisor's Title: Lecturer in Environmental Management

Information and Consent Form

(For Key Informants Interview)

Name of Project: How effectively are social networks using their capacities in disaster resilience and recovery? A case study from the Bangladesh coast

You are invited to participate in a study of 'how effectively are social networks using their capacities in disaster resilience and recovery'? The purpose of the study is to know the contribution of community's bonding (family), bridging (neighbours and friends) and linking (organizations) networking relationships in disaster resilience and recovery in the disaster affected coastal areas of Bangladesh. The study desires to know the key stakeholders/key informants' opinion on the effectiveness of social networks in disaster resilience and recovery, when and why do the linking relationships (organizations) work strongly and poorly, how the linking relationships can be improved in regarding disaster resilience and recovery.

The study is being conducted by Dr Greg Walkerden (chief investigator), Department of Environment and Geography, Lecturer in Environmental Management, phone: +61(0)2 9850-7991, email: greg.walkerden@mq.edu.au and Md. Rabiul Islam, PhD candidate, Department of Environment and Geography, phone: +61(0)2 9850-7985, email: md-rabiul.islam@students.mq.edu.au as being conducted to meet the requirements of PhD degree under the supervision of Dr Greg Walkerden.

If you decide to participate, you will be asked to number of questions relating to contribution of social networks (family members, neighbours and friends, and organizations) in disaster resilience and post-cyclone recovery. We have an open-ended (Bengali version) checklist for key informant interview. You are requested to answer the questions of checklist. You will answer the question based on your perception and understanding from your experiences and as the key stakeholder/key informant. You are also requested to focus on community needs and requirements for building

resilience and promoting post-disaster recovery activities. In the discussion session, you need to spend about 2-3 hours.

Any information or personal details gathered in the course of the study are confidential. We will use some quotes in conference presentations or publications such as journal articles and book-chapters. We will quote your comments and opinions as the broader views of key stakeholders/key informants. No individuals will be identified in any of our publications or presentations. Only the research supervisor (the chief investigator) and PhD candidate (co-investigator) will have access to data. A summary of the study findings will be made available for the participants through sharing meeting with local NGO's, writing text book/book chapters and presenting the study findings in the national conferences.

Participation in this study is entirely voluntary. The participants are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence.

I, *(participant's name)* have read *(or, where appropriate, have had read to me)* and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name: _____

(Block letters)

Participant's Signature: _____ Date: _____

Investigator's Name: MD. RABIUL ISLAM

(Block letters)

Investigator's Signature: _____ Date: _____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone +61(02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome. You can also contact Dr Jakir Hossain, phone: +88 01711 308 723, email: jakir1034@yahoo.co.uk, Executive Director, Development Synergy Institute, if you have any ethical concern re this study.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)

Appendix-B: Questionnaire for household-head survey

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

This questionnaire will be filled-up by researcher along with research assistants through a face to face interview with household-heads of coastal villages. It has to put the tick (✓) mark and fill information wherever is needed]

Information of respondents

Questionnaire Number	
Date of survey	
Interview start time	
Interview terminated	
Name of interviewer	
Village	
Union	Chardoani
Upazilla	Patharghata
District	Barguna

Section: I

A. Socio-economic and demographic information

1.1 Household information

Household members

No	Sex(1) M & F	Age (2) (years)	Years of education (3)	Occupation (4)	Relation to respondents (5)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Remarks: (1) Male-1, Female-2, (4) Agriculture/farmer (own field)-1, Agri.labor-2, Non-agri.labor-3, Fishing (own boat)-4, Fishing labor-5, Business/small business-6, Service-7, others (specify)-8

6. Number of working population in the family

1. Male members 1 2 3 4 5 ---- 2. Female members 1 2 3 4 5 ----

1.2 Family members' capacities/abilities

7. How many healthy, unhealthy and dependent family members you have?

Family members capacity	Number					
1. Healthy adults	1	2	3	4	5	----
2. Incapable/unhealthy adults						
3. Dependent family members	a) Disabled	1	2	3	4	5 ----
	b) Children	1	2	3	4	5 ----
	c) Elderly	1	2	3	4	5 ----

1.3 Income and expenditure

8. Annual household income and expenditure (taka)

1. Annual household income	Amount	2. Annual household expenditure	Amount
a) Farm (agricultural income)		a) Food expenditure	
b) Non-farm income		b) Non-food expenditure	
Total			

1.5 Housing quality

9. Type of house

Housing types	Put (√) mark
1. Pucca: Brick & cemented pillar, wall & floor	
2. Semi-pucca: Cemented floor bamboo & iron sheet	
3. Kucha: Mud, wood & thatch/straw covering roof	
4. Others (specify) -----	

1.6 Asset

10. Land ownership

Ownership type	Decimal
1. Agricultural land	
2. Homestead land	
Total	

11. Animal, livestock and fisheries

Items	Number	Amount (taka)
1. Cows		
2. Goats/sheep		
3. Poultry		
4. Fish pond		
5. Other (specify please)		
Total		

2. Household goods and other asset

Items	Number	Amount (taka)
1. Furniture (cot, shelf, chair, table)		
2. Electronic goods (TV, fan etc.)		
3. Gold ornaments		

4. Motorbike		
5. Bicycle		
6. Boat without engine		
7. Boat with engine		
8. Mobile		
9. Solar power		
10. Farm machineries (tractor, water pump)		
11. Other (specify).....		

Section: II

B. Post-disaster recovery related information

13. Please indicate whether you suffered losses in each of the following, and if so, whether or not you have yet recovered the loss?

Damage and losses	Suffered loss? (1 = yes; 2 = no)	If “yes”, recovered yet? (1 = yes; 2 = no)	Remarks (full/partial)
1. Crop loss			
2. Damaged housing/shelters			
3. Financial loss			
4. Fishing boats and nets			
5. Fish pond			
5. The injuries/health			
6. Income loss			
7. Others (specify please)			

14. How do you have recovered? Or what ways (strategies) did you take to recover?
(Multiple responses are acceptable)

Recovery ways/strategies	Put (√) mark
1. Receive relief goods	
2. Receive loans	
3. Use savings	
4. Sell domestic assets/ goods (specify....)	
5. Sell homestead/cultivated land	
6. Mortgage land	
7. Sell physical labor to farm land, fishing boat	
8. Change occupation/working pattern	
9. Cropping variety	
10. Sell trees	
11. Change food habits (e.g. change frequency of meals, food items and reduce consumption)	
12. Sell agricultural products in advance at lower price	
13. Receive support from working/employed family members	
14. Cooperative/mutual works with community members	
15. Others (specify please).....	

15. If not recovered, why did you fail? Or what are the reasons behind this? (Multiple responses are acceptable)

Reasons	Put (✓) mark
1. Massive damage and loss	
2. Less working members in the family (e.g. more dependent family members)	
3. Lack of savings/financial supports	
4. Lack of food stock	
5. Insufficient relief supports	
6. Irregularities/nepotism in relief distribution	
7. Others (specify please).....	

16. Please indicate the level of help that you received to recover from the damage and losses from each of the following individuals.

1. Working family members
2. Neighbors/friends
3. Relatives
4. Others (please specify)

17. Did you receive any institutional/organizational help to overcome the damages?

1. Yes
2. No

If yes, mention the name of organizations.

1. NGOs
2. Local government (Union Parishad)
3. Banks
4. Cooperative associations
5. International NGOs/Organizations
6. Others (please specify)

What did these organizations do for post-cyclone recovery? (Multiple answers are acceptable).

1. Repair the damaged houses
2. Constructed new houses
3. Provided relief goods
4. Took care the injured
5. Provided seeds for farmer
6. Provided boats and nets for fishermen
7. Provided loan
8. Other (specify please).....

2.1 Contribution of family members and relatives (bonding social network) to disaster recovery

18. How can family members help at the post-disaster recovery stage? (Multiple answers are acceptable)

Support	Family members	Relatives
1. Emotional supports		
1. Provide new shelter/repair damaged shelter		
2. Provide foods/manage/purchase for family		
3. Provide physical labour at own house		
4. Selling physical labour		
5. Money/cash supports		
6. Asset/jewellery supports		
7. Reduce food consumption		
8. Provide recovery related information		
9. Others (specify please)		

19. Do you have any family members working abroad?

1. Yes
2. No

If yes, how their remittance helped you to recover from last disaster?

1. Repair damaged house
2. Provide treatment cost
3. Provide money for agriculture recovery
4. Provide money for fishing recovery
5. Refund loans/credit
6. Others (specify)-----

20. What type of family capacities can assist to disaster recovery?

1. Higher number of working/earning members in the family
2. Healthy family members
3. Less dependent members
4. Family savings
5. Multiple sources family income
6. Sufficient food stock
7. Strong housing
8. Household asset
9. Access to financial institutes
10. Good relationships with neighbours and CBOs
11. Others (specify please)

2.2 Contribution of neighbours and friends (bridging social network)

21. Did you get this any type of help from neighbours, friends and relatives after Sidr?

1. Yes
2. No

If 'yes' what type of help?

1. Collective/mutual help/cooperative works such as: shared labour in repairing house, preparing farm land, repairing boats and nets for fishing
2. Provide information on relief goods, financial helps etc.
3. Sharing houses/shelters during emergency (crisis) period
4. Sharing foods
5. Provide financial helps
6. Other (specify please).....

If 'yes' who can help more in this regard?

1. Neighbours
2. Friends
3. Others (specify please)

If 'no' why they cannot help? (Multiple responses are acceptable).

1. Poor and affected
2. Lack of their willingness
3. Lack of mutual helping/cooperative relationships
4. Others (specify please)-----

22. What type of cooperation you received from your neighbours (N) and friends (F) and what you provided for them?

Cooperation	Received		Provided	
	N	F	N	F
1. Search and rescue				
2. Provide shelter				
3. Food sharing				
4. Loan with interest				
5. Loan without interest				
6. Cooperative/mutual works				
7. Others (specify please)				

2.3. Contribution of linking social networks (organizations) to disaster recovery (when and why do the linking relationships work strongly and poorly)

2.3.1 Social agency involvement

23. Do you or your family members belong to any groups/organizations, networks, associations?

1. Yes
2. No

If yes, which organizations?

1. Farmer group
2. Fisherman group
3. Village committee /Volunteer group
4. Religious group (e.g. mosque/ temple committee)
5. Political group
6. Cultural group
7. Finance, cooperative/ savings group
8. Education group (school committee)

9. Youth group/ Sports group and club
10. NGO group
11. Union Parishad/Union Disaster Management Committee
12. Other groups (specify)

If 'yes', what 'benefits' did you get from these groups after disaster?

1. Repairing the damaged houses/shelters
2. Foods
3. Cloths
4. Health services/Medicare facilities
5. Water and sanitation facilities
6. Agriculture seeds/equipment
7. Fishing materials
8. Non-refundable cash supports
9. Refundable cash supports
10. Loan/credit
11. Mental supports
12. Alternative works/livelihood facilities/involvement with income generating activities
13. Cooking materials
14. Other (specify please).....

If 'no', why you are not involved?

1. Less interest to involve (lack of willingness)
2. Less confidence on them
3. No benefits
4. No time to join/work loads
5. Others (specify please)-----

2.3.2 Access to finance

Loan/credit from informal sources

24. Do you have any loan/credit from following informal sources? (Except NGOs, Bank and cooperative association) (Multiple answers are acceptable).

Sources	Yes	No	Amount (taka)
1. Friends			
2. Neighbors			
3. Relatives			
4. Local shops/pharmacies			
5. Moneylenders			
6. Employers			
7. Other (specify)			
Total			

25. Did you borrow money from formal financial institutes/sources for post-disaster recovery?

1. Yes
2. No

If 'yes' what are the borrowing sources?

Borrowing sources	Detailed of sources (how many sources used)	Put (√) mark	Amount (taka)
1. Bank			
2. NGOs			
3. Cooperative association			
4. Others (specify please).....			

26. Do you pay your loans instalment regularly?

1. Yes 2. No

If 'yes' how do you able to pay? Or In which sectors you have invested the borrowed money?
(Multiple answers are acceptable)

1. Agriculture or farming/ crop agriculture
2. Small business
3. Poultry farm
4. Fish cultivation /fish pond
5. Fishing (boats and nets)
6. Livestock fattening
7. Others (specify please).....

If 'no' why you fail to pay the instalment?

1. Other loans refund
2. Spent for daily basic needs fulfilment (e.g. foods)
3. Spent for treatment/health
4. Spent for daughters' marriage ceremony (e.g. dowry, guest entertainment and gifts)
5. Spent for repairing damaged house
6. Spent for building new house
7. Others (specify please)-----

27. Do you know the interest rate of NGOs?

1. Yes 2. No

If no, why you don't know?

1. NGO workers did not tell clearly
2. No (or less) interest to know
3. Happy to get loan, don't bother about interest rate
4. What will I do to know this?
5. Others (specify please).....

28. Do you think their interest rate is higher than other financial institutes e.g. Bank?

1. Yes 2. No

If yes, why you/ community people are not going to other financial institutes like bank to borrow money?

1. Easy to get the NGOs loan
2. Difficult to get banks loan
3. NGO workers are available/easy communication with them
4. Collateral free NGO's loan
5. Others (specify please).....

2.3.3 Contribution of NGOs as the linking social networks

29. What roles the NGOs play at post-disaster recovery stage?

1. Relief distribution
2. Repairing the damaged house
3. Revive the livelihoods e.g. small business, poultry farm etc. by providing new loans
4. Restore agricultural activities by providing new loans
5. Restore fishing activities by new loans
6. Others (specify please)-----

30. In what contexts NGOs did work strongly (their strengths) at post-disaster recovery stage?

1. Relief distribution
2. Providing new loans
3. Providing Medicare facilities
4. Providing drinking water/ water purification tablets
5. Providing agriculture equipment (seeds and etc.)
6. Providing fishing boats and nets
7. Others (specify please)-----

31. In what contexts NGOs did work poorly (their weaknesses) at post-disaster recovery stage?

1. Realising regular instalment at post-disaster situation
2. Did not come at emergency period
3. Did not provide sufficient relief
4. Others (specify please)-----

2.3.4 Contribution of local Government (Union Parishad chairman & members as the linking social networks)

32. How do Union Parishad chairman and members work at post-disaster recovery?

1. Relief distribution
2. Search and rescue
3. Repairing the damaged shelters/houses
4. Rehabilitation and reconstruction/Repair the roads and embankments
5. Regain water and sanitation
6. Reinstatement the post-disaster livelihoods (e.g. agriculture, fishing etc.)
7. Provide necessary information on rebuilding programs
8. Others (specify please) -----

33. What factors are responsible for inappropriate work/contribution of Union Parishad (UP) at the post-disaster recovery stage?

1. Abuse of political power
2. Nepotism/favouritism
3. Political affiliation/ pressure
4. Bribe (corruption/irregularities in relief distribution)
5. Lack of willingness of Union Parishad representatives (e.g. chairman and members)

6. Unavailability of Union Parishad representatives during emergency
 7. Lack of communication (irregular contact) with the local people
 8. Group conflict at the local level
 9. Lack of financial capacity of Union Parishad
 10. Other (specify please).....
34. What contexts are considered more to Union Parishad at post-disaster rehabilitation and reconstruction program (relief distribution, repair damaged house etc.)?
1. Highly affected people/households
 2. Nepotism/favouritism (in terms of relatives, family members, friends etc.)
 3. Political affiliation
 4. Receiving bribe/corruption
 5. Prioritising people belonging in their (UP representatives) political party
 6. Other (specify please) -----

2.3.5 Corruption at post-disaster recovery stage

35. In which sectors/where corruption is seen at the post-disaster recovery stage?
1. Relief distribution (foods, cloths, drinking water, medicine, cooking materials etc.)
 2. Reconstruction works of bridge, culverts, roads, embankments at the community
 3. Repairing damaged house/building new house
 4. Cash distribution among the victims
 5. Distribution of agriculture equipment
 6. Distribution of fishing equipment
 7. Others (specify please)-----
36. Who are involved with this corruption?
1. Union Parishad representatives (chairman, members etc.)
 2. Village headman
 3. NGO workers
 4. Local political leaders
 5. Local civil society members (teachers, local journalists, women representatives etc.)
 6. Members of Union Disaster Management Committee (UDMC)
 7. Others (specify please)-----
37. Is it possible to combat this post-disaster corruption?
1. Yes
 2. No

If 'yes' or 'may be' what should we do in this regard?

1. Community peoples' awareness
2. Action of law-enforcement agents
3. Awareness of local civil society members
4. Combined community movement against them
5. Others (specify please)-----

38. What roles do normally play traditional community leaders (e.g. imam, kinship leaders and village headman) at the post-disaster stage?

1. Search and rescue
2. Providing shelter (at their own places e.g. mosque)
3. Provide relief (as religious leaders are religiously motivated to do these type of works)
4. Negotiation/keep communication with UP
5. Help the relief provider organizations (as they can understand the local language, culture and religious values and know the most disaster affected/vulnerable community people/family (www.odihpn.org))
6. Give mental supports to affected community people
7. Help to revive community essential services (e.g. drinking water, roads, embankments)
8. Others (specify please)-----

2.3.6 Contribution of Union Disaster Management Committee (UDMC) at post-disaster recovery stage

39. Do you know about Union Disaster Management Committee (UDMC)?

1. Yes 2. No

If yes, what did UDMC do normally at post-disaster stage?

1. Regular meeting to observe and analyse the situation/monitoring the situation
2. Identifying the most vulnerable groups/affected people at high risk
3. Collect statistics of damage and loss
4. Providing necessary supports/relief for the victims
5. Help the relief provider organizations
6. Arrange training and workshops for the community people to disaster risk reduction
7. Help displaced people to come back their previous places
8. Arrange counselling for people suffering from psycho-trauma due to disaster
9. Ensure that the injured people are getting treatment
10. Others (specify please)-----

If 'no' why you do not know about them?

1. Did not see their activities in their area
2. Did not hear about them
3. Do not understand UDMC
4. Others (specify please) -----

2.3.7 Contribution of local civil society members (teachers, local doctors, government employees, local journalists, NGO officials).

40. How can local civil society members (teachers, local doctors, local journalists, NGO officials, government employees) contribute to disaster recovery?

1. Search and rescue
2. Provide temporary shelter at the educational institutes e.g. school, college, madrasa and NGO offices

3. Provide need-based information of affected people about appropriate places/organizations (e.g. Upazilla Parishad, Union Parishad, relief provider organizations etc.)
4. Provide recovery related information e.g. relief, treatment, cash help, cropping seeds and equipment, and fishing instruments, food for work/cash for work specially government programs
5. Help the relief provider organizations to identify actual victims/most vulnerable/affected people
6. Local doctors can provide treatment, medicine and water purification tablets
7. Local journalist can publish news on vulnerability and relief works
8. Communicate with relief provider organizations
9. Work with recovery teams/disaster volunteers
10. Communicate with NGOs and relief providing organization
11. Assess the damage and loss and identify the vulnerable/most affected people
12. Others (specify please)-----

41. How can we ensure the active participation of local civil society members (teachers, local doctors, government employees, local journalists, NGO officials) in post-disaster recovery process?

1. Tag them with the organizations working on post-disaster recovery
2. Keep regular contact with the affected people
3. Explore the community's vulnerability to concerned authority e.g. Union Parishad, Upazilla Parishad and other relief provider/rebuilding organizations/departments
4. List the most affected people and assess the local damage and losses
5. Local government authorities (Union and Upazilla Parishad) include them in rebuilding activities
6. Others (specify please)-----

42. Why do the NGOs, and Union Parishad work poorly?

Causes	NGOs	UP
1. Corruption/irregularities of Union Parishad representatives (during relief works)		
2. Nepotism/favouritism		
3. Local politics/group conflicts		
4. Insufficient capacities of local organization		
5. Relief fund irregularities by NGOs		
6. Repetition of relief works/ Lack of coordination among the organization		
7. High interest rate of NGOs microcredit		
8. Lack of financial capacity of traditional leaders e.g. imam, kinship leaders and village headman		
9. Lack of willingness of Union Parishad representatives		
10. Political pressure on local journalists to publish post-disaster relief irregularities/corruption news		
11. Insufficient medical facilities		
12. Limited resources		
13. Lack of coordination/unity among local civil society members		
14. Others (specify please).....		

Section: III

D. Ways of improvements

43. How can the activities of linking networks (NGOs and UP) be improved for disaster resilience and recovery?

Linking relations	Improvement ways
a) NGOs	1. Create mutual/trusty relationships between local people and development agents
b) Union Parishad	2. Arrange training/awareness campaign program
c) Local civil society members (teachers, local doctors, government employees, local journalists, NGO officials)	3. Accessibility of common people to UP chairmen and members 4. Identify the needs of local people 5. Coordinate among the organizations working on disaster recovery/rebuilding 6. Others

Overall any other ideas/comments:

Thank you very much for giving me your valuable time.

Appendix-C: Checklist for case studies

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. What types of damage and loss did you face during Cyclone Sidr?
2. How did you recover from Sidr damage and loss?
 - Households contribution
 - Relatives contribution
 - Neighbours and friends contribution
 - NGOs contribution
 - Local Government contribution (Union Parishad)
 - Other sources' contribution (if you have)
3. What challenges did you face personally (household context) after Cyclone Sidr?
 - Physical and mental
 - Fishing
 - Farming
 - Other income options
4. Please comments on NGOs microcredit
5. Please comments on moneylenders' loan
6. Please comments on post-Sidr corruption
7. What are your comments on early warning?
8. What about your comments on shelter center?
9. What measures should be taken to improve the conditions of coastal villagers?

Appendix-D: Checklist for Focus Group Discussions (FGDs)

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. Contribution of bonding networks (immediate family members and relative) at the post-disaster recovery stage.

Where contribute (sectors)

How contribute (strategies)

What are the main challenges?

2. Contribution of bridging networks (neighbours, friends) to disaster recovery

Where contribute (sectors)

How contribute (strategies)

What are the main challenges?

3. Contribution of linking networks (NGOs, CBOs) in post disaster recovery

Where contribute (sectors)

How contribute (strategies)

What are the weaknesses?

4. Contribution of linking network (local Government-Union Parishad) at post-disaster recovery stage

Where contribute (sectors)

How contribute (strategies)

What are the weaknesses?

5. NGOs microcredit installment (what practices, how the beneficiaries face the problem)

6. NGOs microcredit interest rest (high/low)

7. How can the NGOs contribution be improved to disaster recovery?

8. How can the local government (Union Parishad) contribution be improved to disaster recovery?

9. What are your comments on early warning?

When you got?

How you got/ by whom you informed

What you did

10. What about your comments on shelter center?

Appendix-E: Checklist for Key Informants Interviews (KIIs) local level

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. Contribution of family members and relatives (bonding networks) to disaster recovery.
 - Where contribute (sectors)
 - How contribute (strategies)
 - What are the main challenges?
2. Contribution of neighbours and friends (bridging networks) to disaster recovery.
 - Where contribute (sectors)
 - How contribute (strategies)
 - What are the main challenges?
3. Contribution of NGOs (linking networks) to post-disaster recovery.
 - Where contribute (sectors)
 - How contribute (strategies)
 - What are the weaknesses?
4. Contribution of local Government (Union Parishad) to disaster recovery.
 - Strengths
 - Weaknesses
5. Contribution of community volunteers
 - Strengths
 - Weaknesses

6. Comments on corruption at the post-disaster recovery stages

Potential corruption sectors	How it happens/nature of corruption
Relief distribution	
Basic essential distribution	
Damaged house repair/ new house allocate	
Necessary reconstruction in the essential services	
Agricultural seeds and equipment distribution	
Fishing boats and nets distribution	
Others	

7. Who are involved with this corruption?
8. How long this is going on?
9. What about your reaction in this regard?
10. What initiatives should be taken to reduce corruption?
11. NGOs loan, installment, and interest rate
12. What are your comments on early warning?
13. What about your comments on shelter center?

Appendix-F: Checklist for Disaster Practitioner Interviews (DPIs)

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

Please comments and views on the below issues

1. Contribution of family members and relatives (bonding social networks) at post-disaster recovery stage.
 - Strengths
 - Weaknesses
2. Contribution of neighbours and friends (bridging social networks) to disaster recovery.
 - Strengths
 - Weaknesses
3. How NGOs contribute to disaster recovery as the linking social networks?
 - Strengths
 - Weaknesses
4. How local Government (Union Parishad) contribute to disaster recovery as the linking social networks?
 - Strengths
 - Weaknesses
5. Please comments on Union Disaster Management Committee (UDMC)
6. Contribution of local civil society members (teachers, imams, village doctors, local journalists, NGO officials, village headmen, local political leaders) to disaster recovery.
 - Strengths
 - Weaknesses
7. Contribution of community volunteers to disaster recovery.
 - Strengths
 - Weaknesses
8. How social networks are articulated in Bangladesh's policy documentations regarding disaster resilience and recovery?
9. What are the major policy gaps?
10. Please comments on post-disaster corruption.
 - Potential corruption sectors
 - Who are involved with this corruption?
 - What are the immediate impacts?
 - How we can protect post-disaster corruption?
11. How can the linking relationships (NGOs and Union Parishad) be improved in regarding to disaster recovery?
12. What are your comments on early warning?
13. What about your comments on shelter center?
14. Ways of building disaster resilient community.

Appendix-G: Checklist for Policymaker Interviews (PMIs)

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. How local Government (Union Parishad) contribute to disaster recovery?

- Strengths
- Weaknesses
- Possible way out to develop

2. Please comments on the Union Disaster Management Committee (UDMC)

- Strengths
- Weaknesses
- Possible way out to develop

3. Comments on corruption at the post-disaster recovery stages

- Corruption sector
- Corrupted agencies and individuals
- What are options to reduce corruption

4. Did your department/ministry receive any corruption allegation after any disaster?

5. What are possible option to reduce post-disaster corruption?

6. How social capital issues are articulated in the policy documents?

7. What are the policy gaps to build disaster resilient community?

8. How can existing disaster policies be developed?

9. What are your recommendations for building disaster resilient community?

Appendix-H: Checklist for NGO workshop

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. How NGOs (as linking networks of households) performed at the post-Sidr recovery level.
 - Where contribute
 - How contribute
 - What are the weaknesses?
2. What major challenges NGOs face to work at the disaster recovery phase.
3. What are your opinion about the allegation of NGOs corruption during distribution of relief support?
4. Please comments on:
 - NGOs loan
 - Repayment, and
 - Interest rate
5. Please comments of moneylenders.
6. Please comment on coordination (with other NGOs and CBOs), and partnerships with Union Parishad and other CBOs.
 - Options
 - Challenges
7. What are the main challenges of coastal communities?
8. What are the possible options to strengthen the capacity of local households?
9. What are the options to build resilient community?
10. What are policy gaps?

Appendix-I: Checklist for meeting with Union Parishad staff

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. How does Union Parishad contribute to disaster recovery?
2. How did you work after Cyclone Sidr?
3. What problem did you face to work after Sidr?
 - Union Parishad context
 - Community context
 - Personal context
4. What are the current challenges do you face to work in the Union Parishad?
5. What are the possible options to strengthen the capacity of Union Parishad to contribute effectively to disaster recovery?

Appendix-J: Checklist for meeting with local journalists

Study title: Social capital and cyclones: how households' social networks contribute to disaster resilience and recovery in Bangladesh

1. How NGOs contribute to disaster recovery as the linking social networks?
 - Strengths
 - Weaknesses
2. How local Government (Union Parishad) contribute to disaster recovery as the linking social networks?
 - Strengths
 - Weaknesses
3. What are your comments on overall relief distribution process and transparency after Cyclone Sidr?
4. What are your responses about post-disaster corruption?
5. What are your comments on early warning?
6. What are the possible options to strengthen the capacity of NGOs to contribute effectively to disaster recovery?
7. What are the possible options to strengthen the capacity of Union Parishad to contribute effectively to disaster recovery?
8. Ways of building disaster resilient community.

Appendix-K: Ethics approval

10/03/2015

Macquarie University Mail - Approved- Ethics application- Walkerden (Ref No: 5201200877)



MACQUARIE
University

Ethics Secretariat <ethics.secretariat@mq.edu.au>

Approved- Ethics application- Walkerden (Ref No: 5201200877)

Ethics Secretariat <ethics.secretariat@mq.edu.au>

18 January 2013 at 09:21

To: Dr Greg Walkerden <greg.walkerden@mq.edu.au>

Cc: "Mr Md. Rabiul Islam" <md-rabiul.islam@students.mq.edu.au>

Dear Dr Walkerden

Re: "How effectively are social networks using their capacities in disaster resilience and recovery? A case study from the Bangladesh coast" (Ethics Ref: 5201200877)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Dr Greg Walkerden
Mr Md. Rabiul Islam

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 18 January 2014
Progress Report 2 Due: 18 January 2015
Progress Report 3 Due: 18 January 2016
Progress Report 4 Due: 18 January 2017
Final Report Due: 18 January 2018

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in

<https://mail.google.com/mail/u/0/?ui=2&ik=62b09b8167&view=pt&search=inbox&msg=13c4a9aba172d110&siml=13c4a9aba172d110>

1/2

an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee

Appendix-L: Photos of study villages

Housing



Kutch house



Semi-pucca house



Cyclone shelter centre (Pucca house)



Community housing—Abashan

Multi-purpose shelter centres



Mosque-cum shelter centre



School-cum shelter centre

Drinking water sources



Pond Sands Filter (PSF)



Drinking water collection from PSF

Collection of drinking water



Drinking water collection from ponds



Drinking water collection from far



Drinking water collection from far



Drinking water collection from far

Livelihoods



Fishing



Fishing



Fishing boats



Fishing nets



Hilsha fish



Kaun fish



Goat as livestock



Duckery



Sunflower as alternative cropping



Mud-cutting as a casual job

Rainwater harvesting process



Uses of house roofs for collecting rainwater



Uses of plastic dram

Community-Based Organizations



Women Development Association & Maternity centre

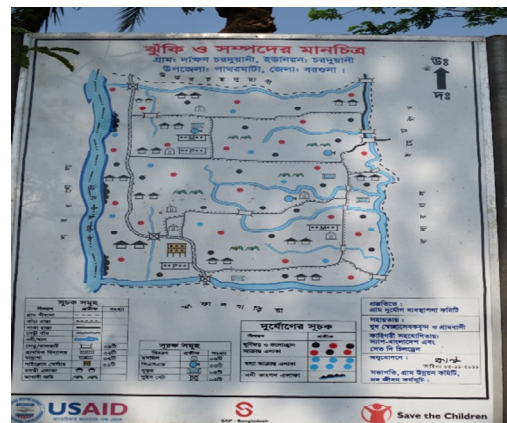


Youth Welfare Association

Initiatives for building resilient community



Awareness campaign for protecting mangrove forest



Community risk and resource map



Awareness campaign for protecting Jatka fishing



Celebration of National Disaster Preparedness Day at local level

