EFFECT OF CORRUPTION ON NATURAL DISASTER VULNERABILITY

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Abstract

With all the talks and commitments about disaster mainstreaming from governments, the UN, Red Cross and Red Crescent authorities, both regionally and nationally, donor agencies and other non-government organizations engaged in Disaster Management, the outcomes in reducing vulnerability from natural hazards, through saving lives and protecting property are far below than the expected level. Why is this so? This study tries to explore relevant major causes hindering disaster preparedness and then looks closely at the role of poor governance and corruption at the institution level contributing to a low level of achievement.

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List of abbreviations

ADPC	Asian Disaster Preparedness Center
BBS	Bangladesh Bureau of Statistics
BDRCS	Bangladesh Red Crescent Society
BMD	Bangladesh Meteorological Department
CPP	Cyclone Preparedness Programme
CPI	Corruption Perception Indexes
DRR	Disaster Risk Reduction
DFID	Department for International Development
EU	European Union
EM-DAT	The International Disaster Database
IFRC	International Federation of Red Cross and Red Crescent Societies
IFAD	International Fund for Agricultural Development
MFDMR	Ministry of Food, Disaster Management and Relief
MoFDM	Ministry of Flood and Disaster Management
NDMC	National Disaster Management Council
NRC	National Research Council
RCY	Red Crescent Youth
SADMC	South Asian Disaster Management Center
TI	Transparency International
TIB	Transparency International Bangladesh chapter
USAID	United States Agency for International Development
WGI	World Governance Indicators

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Chapter 1: Introduction

Bangladesh is listed as one of the hotspot for natural disasters. Disasters are common phenomenon and the country is often and severely affected by floods, cyclones and droughts. In this thesis, I will explore potential reasons contributing towards disaster vulnerability. To explore this, I will adopt a combination of quantitative and qualitative methods in three levels using both primary and secondary data. The case of cyclone Sidr (2007), which hit both Bangladesh and two South Eastern Indian states, will be used to assist comparison between the two countries. This part will be qualitative acquiring information from various reports. For the other two levels, quantitative data will be collected for the purpose of regression analysis.

Bangladesh has been rated to be the nation most at risk from extreme weather and geophysical events – "a study ranking 229 countries on their vulnerability to natural disasters" (NDRI 2010-2011)[1]. The history of disasters striking Bangladesh gives a devastating scenario with the country ranked first out of 162 countries based on human exposure due to flood related hazards and third based on economic exposure. It is ranked sixth out of 89 countries based on human exposure in terms of cyclone related hazards and twelfth from economic exposure. For earthquake, the country ranked seventeenth out of 153 countries based on human exposure and forty-second out of 153 countries based on economic exposure. After the devastating cyclone of 1970 in which half a million people perished, the League

[1] "Asia: Most Vulnerable to Natural Disasters — OWSA: OneWorld South Asia - Latest News on Sustainable Development, Features, Opinions, Interviews with NGO Leaders and Multimedia from India and South Asia." 2015. Accessed June 13. http://southasia.oneworld.net/archive/globalheadlines/asia-most-vulnerable-to-natural-disasters#.VXyAFlyqqko.

of Red Cross, now the International Federation of Red Cross and Red Crescent Societies (IFRC), was requested by the UN General Assembly to undertake a leading role in pre-disaster planning for the country. The Cyclone Preparedness Programme (CPP) of the Bangladesh Red Crescent Society (BDRCS) commenced in 1972. In June 1973, the Government of Bangladesh approved the new Cyclone Preparedness (CPP) programme and undertook financial responsibility for some of the recurring expenses and set up a joint programme management mechanism by creating a programme Policy Committee and a programme Implementation Board.

Cyclones have been a cause of serious concern as it causes more devastation and death in Bangladesh than any other disaster, so it is a top priority hazard to address. ("Bangladesh Disaster Knowledge Network")[2] The cyclones of 1965, 1970, 1985, and 1991 which hit Bangladesh affected people in 32 regions and this has helped to define the vulnerable people and the target group (Natural Disaster Preparedness and Education for Sustainable Development, UNESCO 2007, p. 36)[3]. The most vulnerable lot among the 64 districts are the 19 southern districts which are very near to the Bay of Bengal. These districts have been grouped in terms of their geo-physical characteristics: interplay of tidal regime, salinity in soil and water, and cyclone and storm surge. This zone is a combination of land and sea with 250 coastal islands, large single tract of mangrove forest, Sundarbans and long sandy beach in Cox's Bazar. It has a population of about 35.1 million which is 28% of the total population of the country. The settlements patterns in the coastal zones are highly unorganized and isolated because of high population pressure which eventually hinders disaster management (Miyan 2005, p. 1).

[2] "Asia: Most Vulnerable to Natural Disasters." 2015. Article. *OWSA*. Accessed June 15. http://southasia.oneworld.net/archive/globalheadlines/asia-most-vulnerable-to-natural-disasters.

[3] http://unesdoc.unesco.org/images/0015/001504/150454e.pdf

Academics and policy makers have organized research and guidance around four phases of disaster loss reduction those are mitigation, preparedness, response, and recovery. “According to a newly-released report by the National Research Council (NRC 2006), the core topics of hazards and disaster research include: hazards research, which focuses on pre-disaster hazard vulnerability analysis and mitigation; and disaster research, which focuses on post-disaster emergency response and recovery” (Sutton and Tierney 2006). Preparedness is an important intersection between the pre impact and post impact phases of the disaster.

Popular understanding about preparedness consists of measures and actions that leads individuals, households, organizations, communities, and societiestowards effectiveresponse and faster recoveryafter disasters strike. Aim of preparedness isalso to ensureefficient resource management with relevant know-how to make best use of resources. Disaster preparedness typically incorporate development of plans to ensure alacrity; stockpiling of resources necessary for effective response; and developing enough and efficient human resource for effective emergency response and recovery (Sutton and Tierney 2006, p. 3).

Natural disasters are not under human control but they can be mitigated and their deadly effects can be reduced through formulation of appropriate developmental plans and their execution in a proper way, ensuring effective mitigation measures and building capacity of the local people, through dissemination of right knowledge at the right time.[4] Here comes the concept of disaster preparedness. The concept of disaster preparedness brings the concept of disaster risk reduction. It is a systematic effort by which people and property are less affected

[4] “State Disaster Management Policy.” Government of Rajasthan Disaster Management & Relief Department Food Building, Ground Floor, Government Secretariat, Jaipur-302005, n.d.pg -5 http://www.dmrelief.rajasthan.gov.in/documents/dm-policy-eng.pdf.

by the consequences of the disaster. This procedure encompasses measures and actions designed to enhance the ability to undertake prompt actions under emergency situations in order to protect property and contain disaster damage and disruption, as well as the ability to engage in post-disaster restoration and early recovery activities (Sutton and Tierney 2006, p. 3). The disaster preparedness procedure is also profitable in the sense that is a proven fact that Investing in disaster risk reduction actually saves a lot of money. It is economically more beneficial to invest beforehand, rather than investing after the disaster has taken place. According to World Bank statistics, "for every 1 dollar spent on preparedness, countries save 3 dollar to 4 dollar for every disaster strike".[5] According to ECHO factsheet, "on average, every euro spent of DRR activities saves between four and seven Euros that would be spent to respond to the impact of disasters."[6]

Bangladesh Meteorological Department (BMD) is the primary source of cyclone warning in Bangladesh which generates cyclone warnings and informs the public through media help. There are two separate warning systems for maritime ports and river ports. However, there are still weaknesses in this process of the cyclone warning system of the country. The existing system in Bangladesh is not very easy to understand and almost incomprehensible even to the educated lot. Language used by the weather news reports at the advent of cyclone formation and dissemination are not simple, as a result the message often fails to reach the general people or they don't understand the news. There is also discrepancy about state of accuracy of the warning of the arrival of cyclones which are not always correct.

[5] "Infographic: East Asia Pacific – A Region At Risk." Accessed June 12, 2015. http://www.worldbank.org/en/news/feature/2013/06/03/infographic-east-asia-pacific-a-region-at-risk.

[6] "Disaster Risk Reduction." European Commission, n.d. http://ec.europa.eu/echo/files/aid/countries/factsheets/thematic/disaster_risk_reduction.pdf.

There are instances when warnings of cyclones has been inaccurate (Miyan 2005, p.2).

Every country, developing as well as developed, are vulnerable to natural disasters. Natural disasters come at a cost of life and livelihood. Consequently, Disaster Risk Reduction and Management are considered to be one of the major development issues in the 21st century. All major donor agencies - The World Bank, USAID, DFID, EU etc., and INGOs - the UN, and the Red Cross, have taken this seriously enough to try and encourage governments to place more and more emphasis on mainstreaming Disaster Risk Reduction (DRR). All this, however, is not proving to be successful, except for some small success here and there, at the expected level and vulnerability persists. There are many factors that contribute towards these conditions of vulnerability and one reason which is popularly credited to common-man psyche is corruption. The purpose of this research is to explore whether corruption impacts disaster vulnerability.

Institutional arrangements are absolute necessity to tackle such large-scale disasters. Being a disaster prone country, elaborate institutional arrangements are in place to deal with disasters, including cyclones. There are three committees and three institutions at the apex 3 levels, namely National Disaster Management Council (NDMC), headed by the Prime Minister, Inter Ministerial Disaster Management Committee headed by Minister, Ministry of Food, Disaster Management and Relief (MFDMR), National Disaster Management Advisory Council - MFDMR, Disaster Management Bureau and Directorate of Relief and Rehabilitation. There are broad based Disaster Management Committees operating at the field levels - districts, upazillas and unions headed by the Deputy Commissioner, Upazilla Nirbahi Officer and Union Parishad Chairman at respective areas.

Importance of this topic lies in the cost-benefit analysis of disasters. Studies show that disaster costs continue to rise and the demand has increased to demonstrate the economic benefit of DRR to policy makers (Shreve and Kelman 2014). So, to increase efficiency of disaster management strategies, a core understanding of causalities to disaster vulnerability is critical and a potential positive correlation between disaster vulnerability and poor governance and corruption is required. This understanding will bring forth the necessity to demonize relevant institutions, both within and outside the government, to enhance efficiency and strengthen those institutions capacity to deliver services to the vulnerable people.

Studies show that richer countries appear to be less corrupt (Olken 2012, p. 12). Though richer countries do not face any less number of natural disasters, they do suffer from less number of deaths from disasters when they occur. Studies also show that democracies and nations with higher quality institutions suffer fewer deaths from natural disasters (Kahn 2003, p-9). So, it is of great importance to explore a possible connection between poor governance and corruption and disaster vulnerability. Such knowledge could be useful for both –governments if they are willing to reduce loss of lives and financial damages; for international disaster risk reduction and mitigation agencies to rethink their current programmatic approach of targeting the recipients; and also for donors to think of imposing conditionality while continuing bilateral partnerships with poorer partner nations.

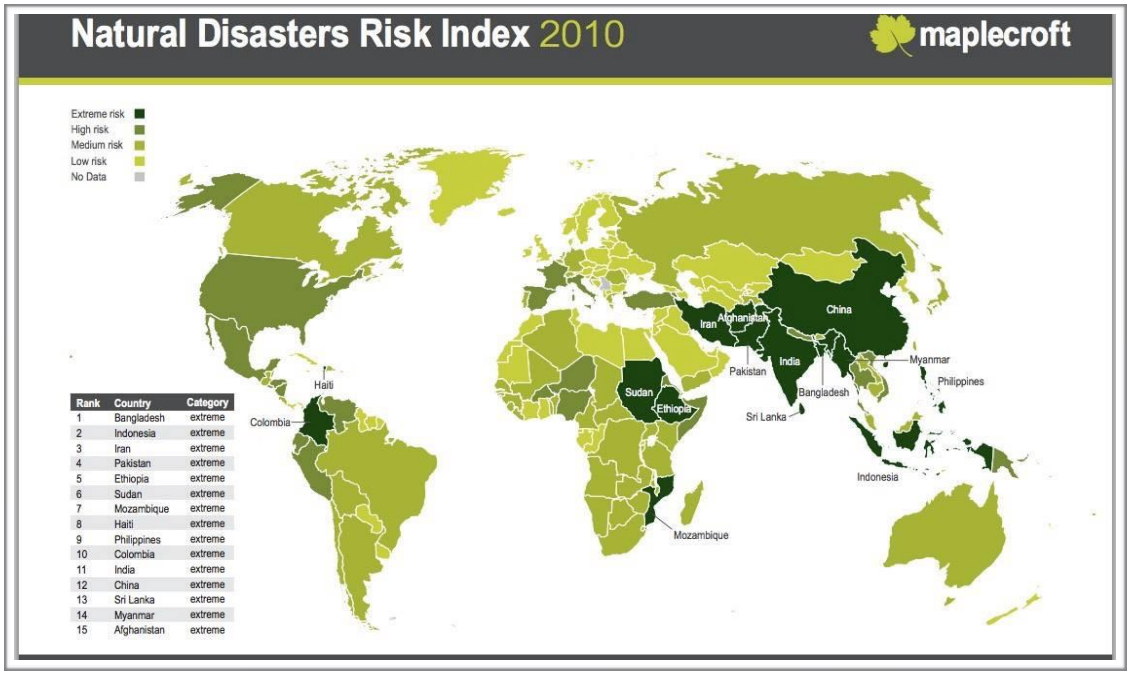

Figure 1: Natural Disaster Risk Index 2010

Source: Natural Disaster Risk Index[7]

Some core concepts:

In this section, I will present a few core concepts in the world of disaster risk reduction, management and preparedness which are relevant for this thesis as we delve deep into the discussion in the subsequent sections – hazard and disaster.

Hazard

Hazards are naturally occurringthreats that effect human life and property in a negative way. This negative effect is called natural disaster.[8] Natural hazards become natural disasters when people's lives and livelihoods are destroyed. Human and material losses caused by natural disasters are a major obstacle to sustainable development. The emergencies database (EM-DAT) classifies an event as disaster, if 10 people are killed and 100 are affected, and then an international state of emergency is declared (Sivakumar 2006, p. 176). The possible natural disasters

[7] http://peacewindsamerica.org/why-asia-pacific/

[8] "Natural Disasters & Assessing Hazards and Risk." Accessed June 12, 2015. http://www.tulane.edu/~sanelson/Natural_Disasters/introduction.htm.

which are considered as threatening are, cyclone, flood, earthquake, tsunami and etc. But the effect of these disasters can be lessened by issuing accurate forecasts and warnings in a form that is readily understood and by educating people how to prepare against such hazards, before they become disasters, lives and property can be protected.

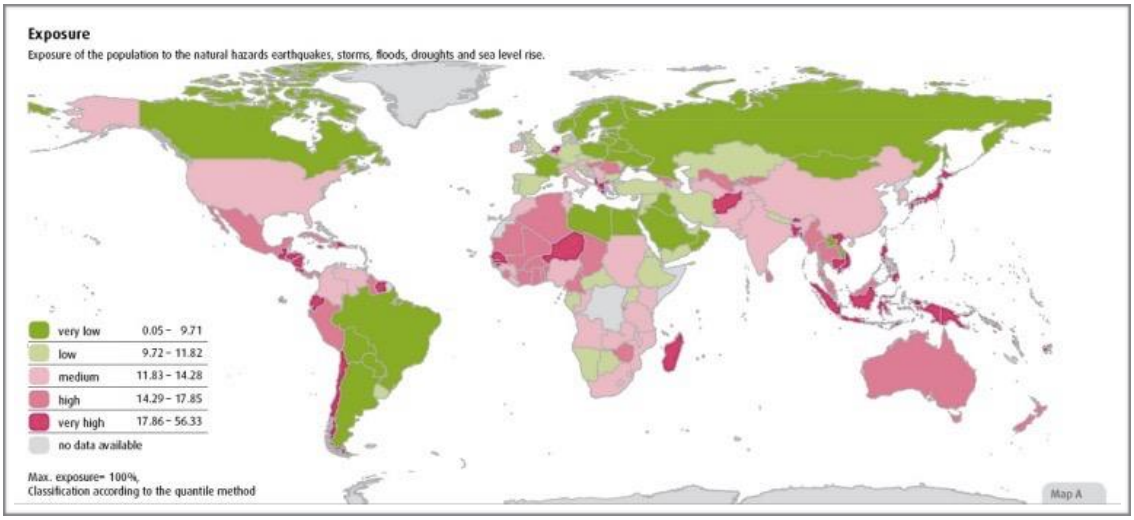

Figure 2: Exposure to natural hazards

Source: World Risk Report 2013 (UNU-EHS , Based on the Preview Global Risk data Platform CReSIS, CIESIN and Global Databases.Detailed Information can be found at www.WorldRiskReport.org)

Natural Hazards can be defined as "Those elements of the physical environment, harmful to man and caused by forces extraneous to him." Tobin (1997, p. 8) quotes Burton and Kates (1964). According to ADPC (Asian Disaster Preparedness Center) hazard is –"A natural event that has the potential to cause harm or loss." World Meteorological Organisation (WMO) defines natural hazards as -"severe and extreme weather and climate events that occur naturally in all parts of the world, although some regions are more vulnerable to certain hazards than others."Researchers have shown that there is a decline in loss of life from natural hazards, but loss of property from those causes has been also increasing. (White, Kates, Burton 2001, p. 81).

Vulnerability

According to Westgate and O'Keefe (1976) the importance of vulnerability can be defined by showing " disaster as the interaction between extreme physical or natural phenomena and a vulnerable human group, resulting in general disruption and destruction, loss of life, and livelihood and injury ". Quoted by (Alcántara-Ayala 2002) from Westgate and O'Keefe (1976). IFRC (International Federation of Red Cross and Red Crescent Societies) provides a dynamic and relative definition of vulnerability. According to them, vulnerability is –"the diminished capacity of an individual or group to anticipate, cope with, resist and recover from the impact of a

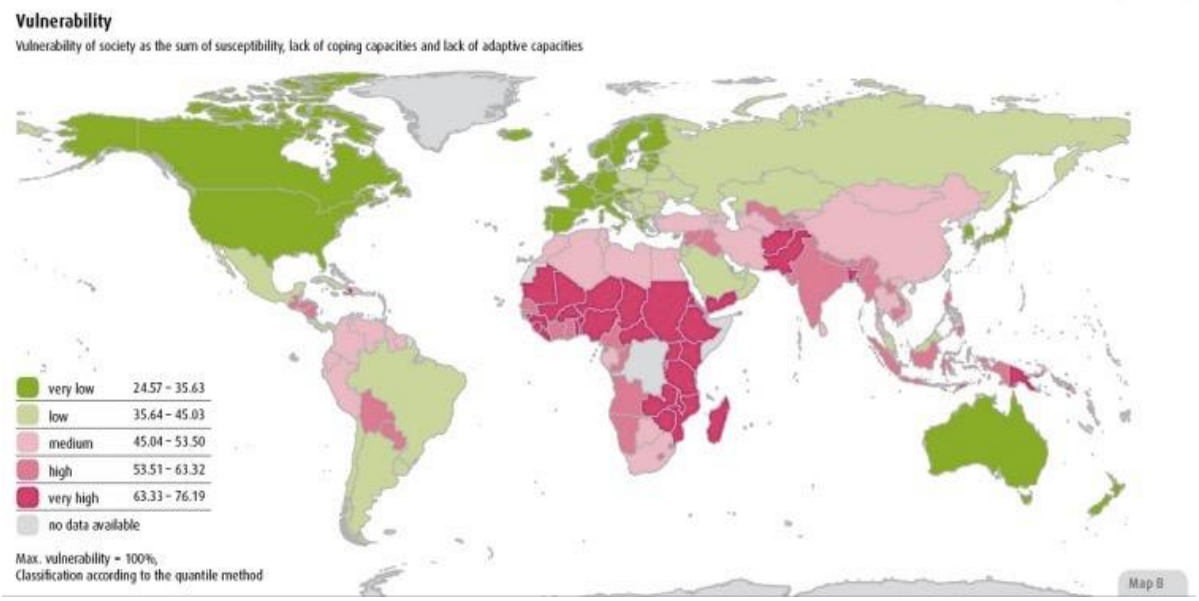

Figure 3: Vulnerability to natural hazards

Source: World Risk Report 2013 (UNU-EHS , Based on the Preview Global Risk data Platform CReSIS, CIESIN and Global Databases.Detailed Information can be found at www.WorldRiskReport.org

natural or man-made hazard." The World Risk Report 2011 locates Bangladesh among the most vulnerable countries in the world.

Vulnerabilitysimply means the degree to how much a person might be affected in terms of loss and damage. IFRC track causes behind vulnerability in the following ways –

Exposure to risk: this could result from various factors such as belonging to a particular social group (ex. Religious minorities), gender (ex. Female), ethnic identity (ex. Ethnic minorities), age (ex. Children, elder members) etc.

Low capacity: Resources available to individuals, including a communities'ability to organize its skills at individual levels as well as organizational levels. Ability to cope with a threat, as a household and as well as a community, is subject to resisting and coping with the adverse impacts of a hazard. World Risk Report 2011 defines 'capacity'in two ways – coping capacity and adaptive capacity, in both respect Bangladesh's capacity ranks it amongst high-risk countries.

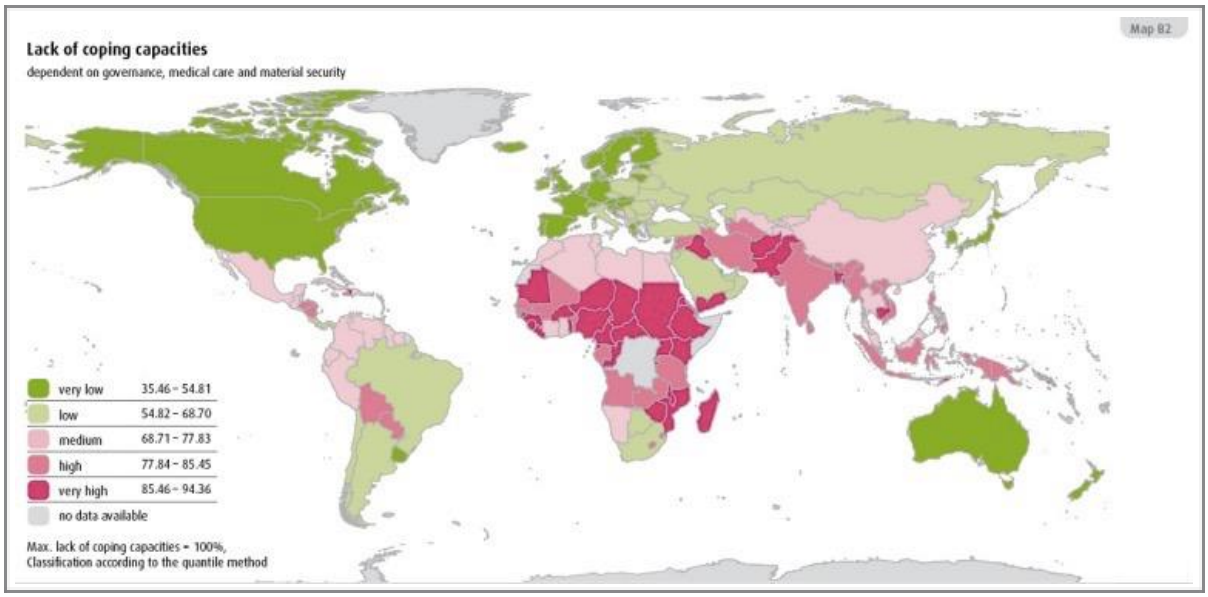

Figure 4: Lack of coping capacity

Source: Source: World Risk Report 2013 (UNU-EHS , Based on the Preview Global Risk data Platform CReSIS, CIESIN and Global Databases.Detailed Information can be found at www.WorldRiskReport.org

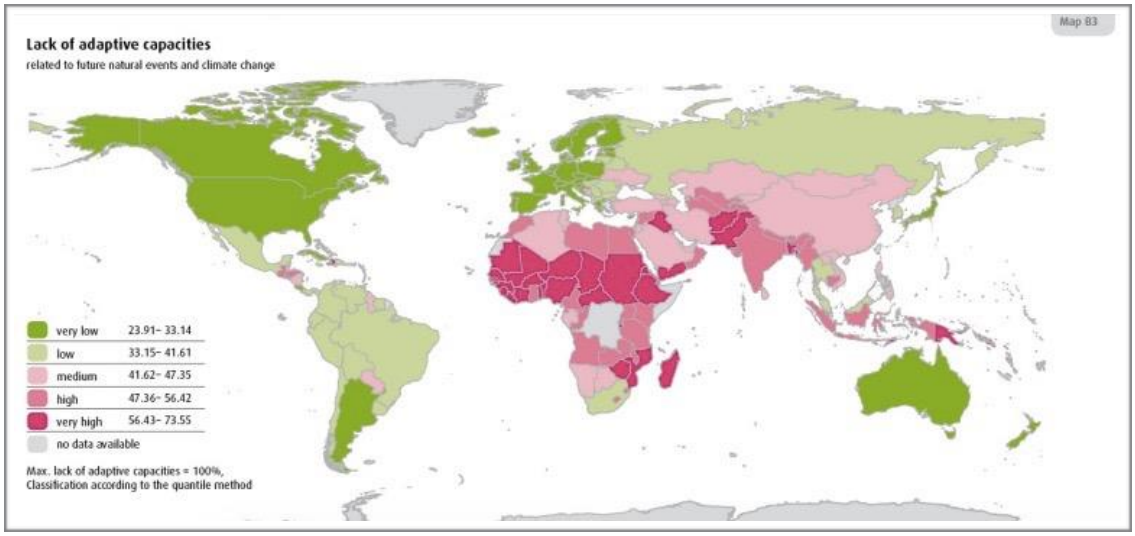

Figure 5: Lack of adaptive capacities

Source: Source: World Risk Report 2013 (UNU-EHS , Based on the Preview Global Risk data Platform CReSIS, CIESIN and Global Databases.Detailed Information can be found at www.WorldRiskReport.org

Disaster

Practitioners and academia largely agree that disasters are not beyond human control. Disaster, by definition, is an event "…often caused by nature…can have human origin". The United Nations defines disasters as - "…a result of the combination of the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences of the hazard." IFRC defines disasters as – "A disaster occurs when a hazard impacts on vulnerable people." A graphic representation of this would take the following form -

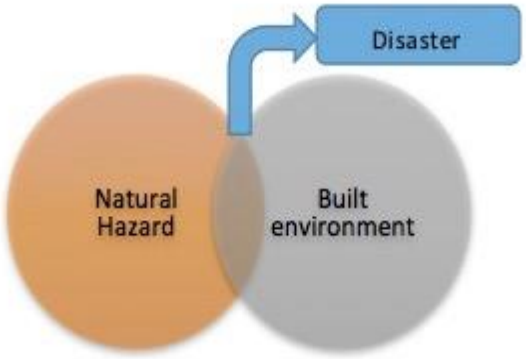

Figure 6: Formation of disaster

One of the main characteristic differences of natural hazards from disasters is that hazards are a part of the natural environment, and disasters are not. How, then, do these two interact? Their interaction could be seen in the following way:

Disaster occurs when natural hazard intersects with the 'built environment'. The US department of Health and Human Services (HHS, 2004) "broadly defines 'built environment'as the human-made space in which people live, work, and recreate on a day-to-day basis. It includes the buildings and spaces we create and modify. It can extend overhead in the form of landfills." (Nova Scotia Built Environment 2030, 27 January 2014)

In 2010, the World Bank and the UN jointly published the report *Natural Hazards, Unnatural Disasters* depicting how the human systems and built environments are susceptible to disasters. The same year, a total of 385 natural disasters killed more than 297,000 people worldwide, affecting over 217.0 million others and causing US $123.9 billion of financial damage (CRED, 2011). The report further comments that every disaster is unique, but each exposes actions – by individuals and governments at different levels – that, had they been different, would have resulted in fewer deaths and less damage. The number of deaths and volume of damages in disaster events are exacerbated mainly due to 'acts of omission and commission' (Natural Hazards, Unnatural Disasters 2010, p.1).

These 'acts of omission and commission'in many cases result from corruption at the institutional level and eventually leads to the deepening of disaster vulnerability. It is a general believe that corruption is one of the primary reasons behind excessive loss and damage in natural disasters. For example, an analysis of the Pakistan earthquake in 2005, which left more than 18,000 people dead, lists corruption to be one of the root causes for vulnerability that resulted in the disaster.

Another report from India shows that the relief aid which was given in 2013 flash flood in Uttarkhand didn't reach the victims because of corruption. An English Daily of India reprts that there was about 100 crore of INR[9] aid, which was misused by the aid officials (The Times of India, 31 May 2015).

Cyclone Sidr

Cyclone SIDR is the most powerful cyclone to hit the South-Western coast of Bangladesh with landfall since the 90s. The category IV[10] cyclone affected 30 (Bangladesh 2007 Cyclone Sidr, MoFDM, 2009, p. 44), of the 64, Bangladesh districts with wind speed of up to 240 Km per hour and storm surge reaching up to

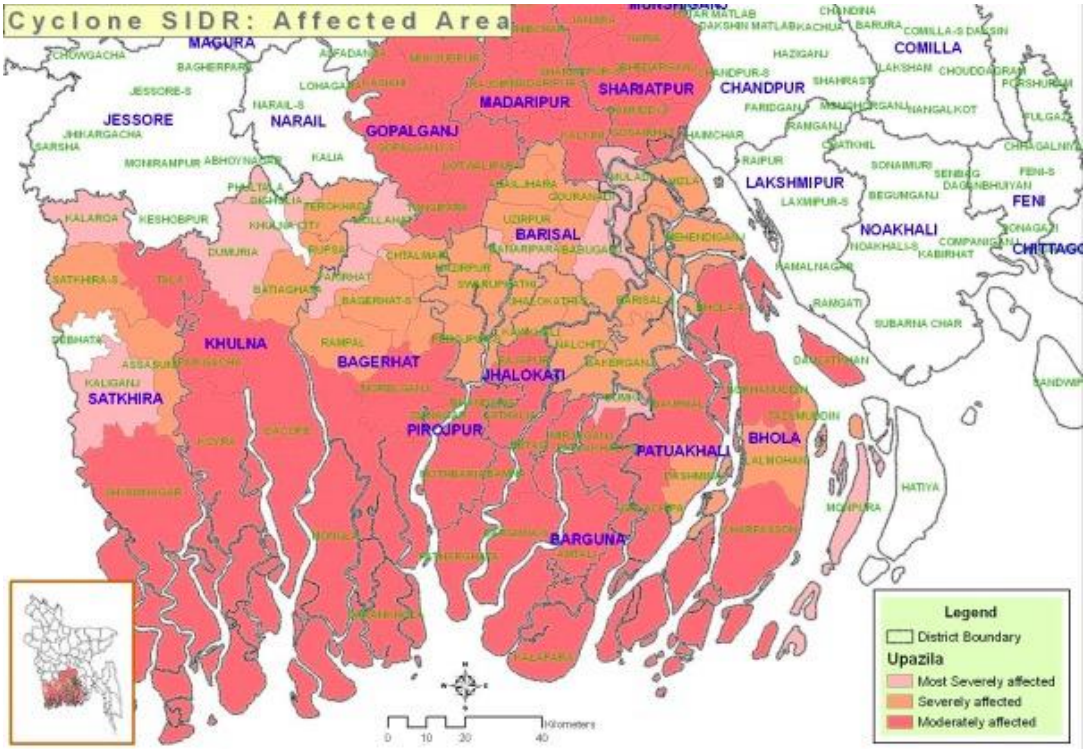

Figure 7: Affected Bangladeshi districts from cyclone Sidr

[9] INR = Indian Rupee; 1 USD = 64 INR (15 June 2015)
[10] As defined in the Saffir- Simpson hurricane intensity scale

9.8 feet (Bangladesh 2007 Cyclone Sidr, MoFDM, 2009, p. 44). The devastating cyclone, termed a 'super cyclone' by Government of Bangladesh, registered a death toll of approximately 3406, with over 55,000 injured, and another 1,000 remained missing ("Super Cyclone Sidr 2007, February 2008, p. 5). The death toll, however, is considerably low compared to previous such hazards, credit to the improved early warning system in Bangladesh which mobilized 40,000 trained Red Crescent Youth (RCY) Volunteers resulting in evacuation of approximately 2 million people[11]. In this study, I will explore potential effect of corruption with disaster vulnerability in case of Bangladesh and India as the same cyclone hit both countries.

The cyclone also affected two Indian states - West Bengal and Orissa, however with stark negligible impact ("Cyclone Crosses Orissa without Damage, Veers-off West Bengal", 2007, National Institute of Disaster Management. p. 1). There was no death or injuries registered in the two Indian states. State authorities evacuated approximately 30,000 people from the coastal areas in the two states to safe shelters ("India: Cyclone Sidr", IFRC, Bulletin, 21 November 2007, p. 2). In the data analysis section, I will also explore possible reasons behind this difference in outcomes through comparison between the affected districts of Bangladesh and the two affected states of India.

Aims and objectives

Famous geologist Michael P Searle, Professor of Earth Sciences at Oxford University, predicted the recent Nepal earthquake, that jolted the small country on 25 April 2015 killing more than 8800 people, two years ago, mentioned – "Earthquakes don't kill people, buildings do… Nepal, Pakistan and other countries always have far

[11] "BANGLADESH: Megaphones Save Thousands." 2015. IRINnews. Accessed May 31. http://www.irinnews.org/report/75470/bangladesh-megaphones-save-thousands.

more deaths during earthquakes mainly due to poor infrastructure." (Swarup, 7 May 2015, The HIndu) This statement essentially captures the mode of most academicand non-academic works done tracing relation between corruption and disasters. Those works have only focused on the area of public sector corruption in physical infrastructure and how weaker infrastructure lead to disaster vulnerability.

The way I connect the issue of corruption with disaster vulnerability, however, is through poor implementation and public sector corruption. This corruption and subsequent poor implementation results in greater number of deaths and financial damage as they are calculated after each disaster. Looking only at the number of deaths and financial damages make disaster preparedness activities falling short of their marks. However, this is critical to realize that none of those reports asses the effect of corruption in the public sector and resulting weakened institutions from them. Consequently, I argue in this paper that, talking about mainstreaming of disaster preparedness and strengthening emergency response as well as post-disaster reconstruction activities will not make the poor any less vulnerable. It is this institutional form of corruption and a lack of state capacity needs to be tackled which has an over arching effect on all sectors including disaster preparedness.

2.1. Research questions

Since very little academic work has advanced their argument exploring potential correlation between institutional corruption and disaster vulnerability from the scope of state capacity, my study will approach this very issue with the following research question:

What factors contribute towards disaster vulnerability?

2.2 Hypotheses

H_1: Hypothesis of this thesis is - corruption at the institutional level (political and bureaucratic) is a key contributor towards disaster vulnerability.

H_a: Alternative hypothesis of this thesis is - a lack of state capacity and low level of economic development prevents investment towards public services. What follows from this is, poor quality in disaster preparedness and a greater loss of lives and financial damages.

2.3 Research methods

In order to test hypotheses of the study and examine the main questions raised, I will analyze official and unofficial statistics. In order to gain a comprehensive picture, myapproach will entail analyzing bothquantitative as well as qualitative data. Theanalysiswilltake place in three levels –

Level 1: Eight districts of Bangladesh

I will collect data on eight Sidr affected districts in Bangladesh by analyzing reports produced by Bangladesh Bureau of Statistics, reports from different international organizations, and news articles. Also, 200 interviews will be conducted, through specific questionnaires, with affected people in the eight districts who received emergency relief after the cyclone, as well as Red Crescent Youth (RCY) volunteers who are trained to work in various capacities. Since RCYs offer voluntary services, they can provide unbiased view about signs of institutional corruptionas they have no financial stakes with respective branches ofBangladesh Red Crescent Society.

The collected data from eight Southern districts will be distributedin two clusters – cluster one: four most affected districts, and cluster two: four medium affected districts. I intend to draw a comparison between these two clusters to determine whether corruption played a significant part towards vulnerability. To serve this purpose, the following will be measured: total number of death, total number of injured, total number of people affected, level of financial losses (through damage of

house, damage of cattle etc.). I will run multiple regressions to see if the collected data indicate any significant correlation across the different variables.

Level 2: comparison between affected Bangladesh districts and Indian states

Since India has historically done much better in controlling corruption when compared with Bangladesh, a comparison drawn through data collected from Indian Planning Commission and other online resources would enable me to locate possible reasons behind different outcomes of the same cyclone. Since, the two Indian states had no people dying from the event, there is only a very few reports available on cyclone Sidr for India and understandably there is no information available on financial damages.

Level 3: analysis of cross-national data from 127 countries

For the purpose of analyzing cross-national level data, a host of varying sources will be consulted – total death and damage related data for 2007 mainly from disaster related database EM-DAT (2015), a comprehensive analysis of the official statistics on level of corruption drawn from Transparency International's Corruption Perception Indexes (CPI) for a period of 2001 till 2007, the six Worldwide Governance Indicators (WGI) by World Bank, GDP per capita data on 2007 from World Bank, population density data form World Bank, and polity data on political stability and durability from Polity IV dataset. These data will be analyzed through regression using the data analysis software STATA v. 13.

Regression formula:

i. total death = $\beta_0 + \beta_1 X_i + \beta_2 X_2 + \beta_3 X_3 + u_i$

ii. total damage = $\beta_0 + \beta_1 X_i + \beta_2 X_2 + \beta_3 X_3 + u_i$

Where,
β_0 = intercept
β_1 = coefficient of corruption
β_2 = state capacity indicator
β_3 = other indicators
u_i = error term

2.4 Limitations of the thesis

One of the major limitations of this study is getting relevant data for the study. Two hundred responses have been collected, but this also is not a good and proper sample, because the number of affected people was huge. The cyclone occurred in 2007, so the answers to most of the interview questions are given from the memory. As our respondents are mostly from the lower strata of the society, the answers given by them are not always correct or authentic. The number of responses collected were 200, which is much lower than the sample size and this can affect the result if regression. The method

Organization of the Thesis

This study is organized into four sections. In the first section, I would briefly introduce the concept of natural disaster preparedness and how it works for Bangladesh. These descriptive will help to built a framework for my later quantitative analysis. The second section deals with the literature review part, where I have dealt with the previous studies and how my work fills the gap that has not been addressed in the previous works. My third part of the thesis deals with the relationship of state capacity and vulnerability, and how state capacity affects vulnerability. My last section deals with data analysis, where I have done regression in three sections. In the first section I have regressed with data from eight most hard hit dstrict of Bangladesh, in the second level, I have compared data between India and Bangladesh. I have taken India, because India was also hit by cyclone Sidr in 2007, and this would help me to compare why Bangladesh suffered so huge a loss while India's loss was negligible in comparison. Thirdly I have done a cross-national regression to see if corruption has a positive statistically significant correlation with

disaster vulnerability. At last I will be concluding by summarizing my findings, from the regression and analyzing them, with respect to my hypotheses.

Chapter 2: Literature Review

Studies relating to natural disasters can be classified in a number of ways. Most of the studies are related to political economy of natural disaster, and the rest are related to social impacts of natural disasters. The concept of disaster management, has been there since from the 20th Century. A number of studies show that natural disasters have caused greater losses in poorer nations rather than in developed countries (ISDR 2002; World Bank 2005; CRED 2007). This has increased the need for disaster reduction approaches (ISDR 2004; UNDP 2004; DFID 2005) and approaches adaptable to individual social and livelihood experiences are required. Hoppe in his research shows that losses from natural disaster have increased dramatically since 1950's (Hoppe 2007). According to a press release by Severe Weather in North America: Perils-Risks-Insurance - "The insured losses amounted to US $510bn, and some 30,000 people lost their lives due to weather catastrophes in North America during this time frame. With US $62.2 billion insured losses and overall losses of US $125 billion (in original values) Hurricane Katrina in 2005 was the costliest event ever recorded in the US. Katrina was also the deadliest single storm event, claiming 1,322 lives." (Aljazeera, 30 November 2012)

The studies done so far have been mainly in a partly manner. My review of existing literature reveals that very few academic works has been done exploring potential connection betweennatural disaster preparedness and corruption. Most of the work in academia has been done regarding how corruption in public sector adds

to the loss and damage during a natural disaster. According to a study done by Tanvir Mahmud and Martin Prowse entitled: “Corruption in cyclone preparedness and relief efforts in coastal Bangladesh: Lessons for climate adaptation” examines if cyclone preparedness and relief interventions are subject to corrupt practices (Mahmud and Prowse 2012, p. 5). The study was done on Cyclone Aila in 2009.The survey was based on 278 households, three focus-group discussions and some interviews. The main issue of the article is to investigate the nature and extent of corruption in pre and post disaster interventions in Khulna, a southern district in Bangladesh, before and after Cyclone Aila in May 2009. The main results of the study showed that about 99% of households suffered from corruption before or after Cyclone Aila. The most affected were the people below poverty line. They were also the victims of corruption in the pre-disaster preparedness phase. Middle-Income households were, on the other hand, were affected by particular forms of corruption in the post disaster phase. The most common form of corruption reported was negligence to provide services and nepotism in the pre-disaster interventions phase.In the post-disaster intervention phase, wage/asset stripping, bribery and the misuse of resources were widespread (Mahmud and Prowse 2012, p. 933). The study concluded that almost every household reported of corruption in the pre and post disaster intervention phase (Mahmud and Prowse 2012, p. 941).

Another important work was done by Katie Hapeman – “The Effects of Politics on Natural Disasters: Lessons Learned from Bangladesh”, Katie Hapeman shows how political conditions of a country before, during, and after a natural disaster can determine who is most at risk, who can intervene, what actions will be taken, and who will benefit from those actions. The study looks into the effects of politics on the humanitarian situation in Bangladesh during the 1991 cyclone. Ultimately, this case

study will demonstrate that economic, social, and political factors increase the devastating impact of a natural disaster (Hapeman 2012, p. 1).

Another study done by Cohen and Werker in the article titled, “The Political Economy of ‘Natural’ Disasters” argues that good governance is important to decrease losses in natural disaster. They through their quantitative study also show how foreign aid decreases government investment in such disasters (Cohen and Werker 2008, p. 1).

Islam (1974) prepared a Bangladesh country paper entitled ‘Human adjustment to cyclone hazards: a case study of Char Jabbar. In this study he concluded that lack of education regarding disaster and its management has led to increased amount of damage. He also suggests that a better coordination between private and public action is required to decrease the deadly effect of natural disater (Islam 1974, p. 28, 31). Another study done by Matthew E. Kahn, entitled “The Death Toll From Natural Disasters: The Role of Income, Geography, and Institutions” shows that countries with higher economic development provides extra protection against natural disaster shocks. Institutional quality is important and the study shows that democracies and nations with higher quality institutions suffer less death from natural disaster (Kahn 2003, p. 1). The same is argued by another study jointly done by the world bank and United Nations in 2010, entitled “Natural Hazards, Unnatural Disasters The Economics of Effective Prevention” that proper governance, state capacity and transparent institutions are important to decrease the amount of damage and loss from natural disaster. The report also argues that disaster preparedness is cost effective and lastly, public and private actions should go hand in hand to combat disaster (United Nations 2010, p. 1-3). Another report done by Sutton and Tierney (2006, p. 12), discusses how academicians measures about the

concepts and methods used in assessing preparedness. Haque and Blair (1992) in their article entitled “Vulnerability to Tropical Cyclones: Evidence from the April 1991 Cyclone in Coastal Bangladesh” show that, although a hazard warning process was helpful in pulling people out of immediate disaster but psychological issues like disbelief in the warning system, fear of burglary, and a lack of sufficient cyclone shelters were among the factors identified by affected people as resulting in greater loss. People and communities vulnerable to natural hazards also face a lot of other risk, which are can be called post disaster effects. Security becomes an issue and in this context crimes and thefts becomes easy. These things further complicate life and results in loss and damage of life and property (Haque and Blair 1992, p. 223). A review by Dove and Khan (1995) in their article entitled “Vulnerability to Tropical Cyclones: Evidence from the April 1991 Cyclone in Coastal Bangladesh” the cyclone's impact was worsened by the irrational behavior of individuals and the limited resources of the nation. The study which was a discourse analysis based on media and government reports shows that due to lack of state capacity and poor governance, the effect of the disaster was more worse (Dove and Khan 1995, p. 445). Ohiduzzaman (1993) in his thesis entitled “Socio-economic and Environmental Effects of the 1991 Cyclone in Coastal Bangladesh: A Local Level Analysis.” concludes that lack of cautiousness and improper disaster management system are the major factors which worsens the condition after a natural hazard and creates an unmanageable disaster condition (quoted from Ohiduzzaman 1993 by Alam and Collins 2010, p. 5).

Another study, “The Deadly Effects of Corruption: A Cross-National Study of Natural Disasters, 1980-2010 “ by Asquer (2011, p.2), argues that corruption is definitely an important factor for increasing number of deaths and damages in

natural disasters. A cross-national study by the author proves his findings. Escaleras and Amnbarci in their paper named “Public Sector Corruption and Natural Disasters: A Potentially Deadly Interaction” analyses if corruption in the public sector plays a role in natural disaster. They tested the whole process empirically by analyzing 344 major quakes occurring in 42 countries between 1975 and 2003. Their research methodology was Negative Binomial estimation strategy that takes into account the endogenous nature of corruption and controls for a number of other factors such as earthquake frequency, magnitude, and distance from population centers, and a country’s level of development which have been shown to influence a quake’s destructiveness. The result shows that number of deaths and public sector corruption is both positive and statistically significant (Escaleras, Anbarci and Register 2006, p. 1). Juliet Sorensen in her article titled, “Why are Natural Disaster Breeding Grounds for Corruption” points out that during fund and relief distribution officers are caught taking bribes and laundering with the relief and money. Her case is based on United States, and how officers have taken advantage of natural disaster to fatten their pockets. She concludes with the advice that State and local executives must include in their disaster preparedness laws rules and punishment to address the increased opportunity for fraud and corruption. This is one of the demanding issues for public safety (Sorensen, 3 March 2014). Another report prepared by the Berkeley Center for Religion, Peace and World Affair entitled, “Natural Disasters, Political Corruption, and a Culture of Resilience in the Philippines” also carries the same logic as that of Sorensen that corruption is an very important factor which hinders preparation and response to natural disasters (Thura, 18 December 2013). The same argument that corruption is an important factor which hinders proper relief in disaster relief effort is also echoed by Anna Nadgrodkiewicz in her article titled,

"Tackling corruption in disaster relief efforts" (9 December 2013). In contrast to the above argument, a study by Cordis and Milyo (2013, p. 1), titled "Don't Blame the Weather: Federal Natural Disaster Aid and Public Corruption" argues that their results contradict previous results and that corruption is not the primary reason for mismanagement during a natural disaster. In the above section we mainly reviewed the studies that dealt with corruption and post disaster relief.

Chapter 3: State Capacity and Corruption

State capacity and corruption are the two major factors that affect disaster risk reduction and preparedness. A number of studies have shown that public sector corruption is one of the most important reasons for huge losses from natural disasters. Also, experience of this researcher is that there is a general tendency of corrupt politicians who use poor people and their vulnerability to play into their own advantage of getting reelected. There are reports of mismanagement of emergency relief connecting local politicians and their nepotism in the aftermath of cyclone Sidr. ("Bangladesh - Aftermath of a Cyclone." 2015; Libcom.org) [12] The researcher personally encountered suspension of emergency relief activity in the South Eastern district of Chittagong by IFRC monitoring officials following reports of widespread nepotism and partisans while selection of relief recipients. Further, state capacity is a measure of how well a country will perform in the face of a disaster. This chapter will discuss in details the role of state capacity and corruption and how they affect disaster preparedness policies in general and also in case of Bangladesh.

Conceptualizing State Capacity

[12] https://libcom.org/news/bangladesh-aftermath-cyclone-04122007

State capacity and governance go hand in hand. This is a known phenomenon that good governance increases state capacity. Governance has been defined as:

"... the traditions and institutions by which authority in a country is exercised" including "…the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them" (Kaufmann et al. 1999, p. 1).

According to Skocpol, State Capacity is the ability of a government to administer its territory effectively (Quoted by Wang 1995, p. 89 from Skocpol 1985). State capacity is related to governance. Again, good governance increases state capacity. A number of indicators such as health and education, infrastructural quality, gross development product, governance and level of corruption in the country can measure state capacity. The concept of state capacity covers political, fiscal and administrative component, which also overlaps each other. A good government must try to formulate sound policies and implement them. A political commitment is necessary to start enhancing and reforming the state system (Zafarullah and Rahman 2008, p. 741). Stable democracies generally have good governance, which eventually increases their state capacity. But in underdeveloped and newly developing countries political stability and gross development product is seen as two of the main indicators that affect state capacity and performance. State capacity also depends on how the state increases its capacity building and this has a huge effect on disaster management. The state should effectively prepare and promote the culture of preparedness and resilience through proper disbursement of knowledge

and education regarding disaster. The state must also be active to take all possible preventive and mitigating measures so as to minimize the loss from the disaster.

Bangladesh is still a country under transition, both politically and economically. The political condition of the country is still far from being stable. The two major political parties of Bangladesh - BNP and Awami League, have been proven inefficient in increasing state capacity. The political instability have loomed in over since the birth of the country in 1971. This has increased not only corruption but also has withheld normal capacity building procedures. Bangladesh has a negative score of 1.5 in 2007 in political stability by World Bank indicator index, which is a very low score and indicates extreme instability in the country. Figure 7 illustrates the condition of political stability in Bangladesh.

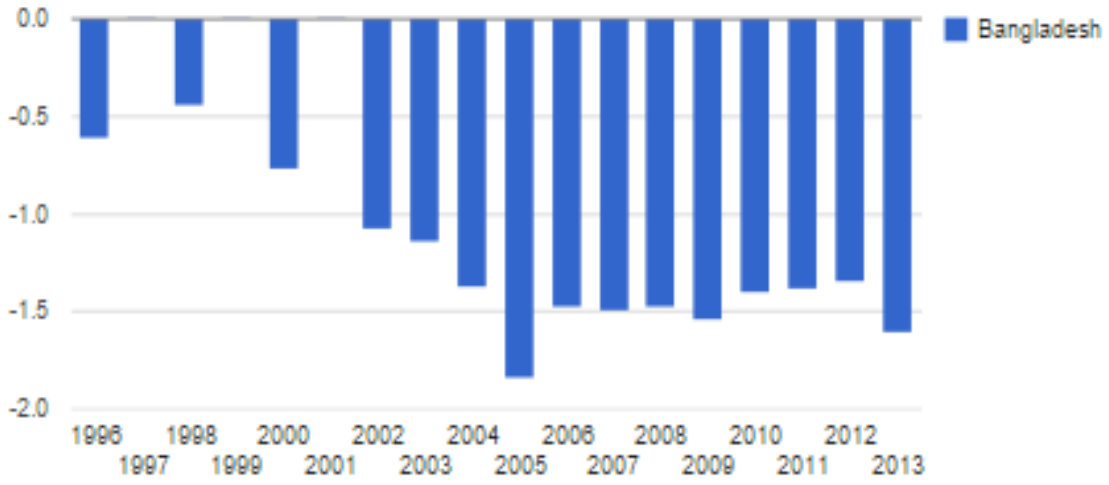

Figure 8: Political Stability Index

Source: The World Bank (govindicators.org)[13]

The World Bank index for Political Stability and Absence of Violence for Bangladesh indicates perceptions of the likelihood that the government of

[13] "Bangladesh Political Stability - Data, Chart | TheGlobalEconomy.com." 2015. Accessed June 13. http://www.theglobaleconomy.com/Bangladesh/wb_political_stability/.

Bangladesh will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.

Poor or bad governance and corruption: Both go hand-in-hand

Before we delve deeper in the issue, we need to analyze whether poor governance or corruption, or either of these is result of the other contributing eventually to disaster vulnerability. Review of available literature did not seem to draw any conclusion on this issue. Let us start with defining governance and essentially what constructs poor governance.

International Fund for Agricultural Development (IFAD) defines governance to be – "…the set of processes, policies, laws and institutions affecting the way a country, institution, society, etc., is directed, administered or controlled. Good or fair governance implies that mechanisms function in a way that respects the rights and interests of the stakeholders in a spirit of democracy. It promotes accountability and strengthens confidence in government/ management administration."[14] The World Bank defines governance as – "the way in which public institutions perform their functions in a country" and "are strongly correlated with deficiencies in development" ("Corruption and Governance", 2015) [15]. Both these definitions are important since they essentially established criteria for 'good governance' and 'bad or poor governance' respectively.

Kauffman, Kray and Lobaton (1999) define governance broadly as the traditions and institutions by which authority in a country is exercised. This includes – i) the process by which governments are selected, monitored and replaced, ii) the

[14] http://www.ifad.org/governance/index.htm

[15] "Corruption and Governance." 2015. Accessed June 15. http://lnweb90.worldbank.org/eca/eca.nsf/Sectors/ECSPE/E9AC26BAE82D37D685256A940073F4E9?OpenDocument.

capacity of the government to effectively formulate and implement sound policies, and, iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them (quoted by Seppo 2004, p. 83 from Kaufmann, Kray, Zoido-lobaton, 1999).

IFAD's definition of governance essentially establishes linkage between "good governance and successful development". From this platform, IFAD offers to define 'good governance' as – "Good governance is, in short, anti-corruption whereby authority and its institutions are accountable, effective and efficient, participatory, transparent, responsive and equitable." ("Governance and Corruption", 2015) [16]

The intersection of corruption and governance is a relation that is more reflexive in its nature, which means one affects the other. According to the World Bank, corruption at high levels of government, especially when the state has been captured by vested interest groups, has an even more profound impact on the degree of impact: "it forms barriers to entry by creating a less competitive business environment and adds to business risks by increasing the level of unpredictability of government policies that are captured."[17]

World Bank's definition of 'bad governance' establishes different building blocks such as – "corruption, distortion of government budgets, inequitable growth, social exclusion, lack of trust in authorities."[18] This also indicates towards inefficiency of government institutions and policies since Inefficiency of formal governance institutions leads to creation of informal institutions that substitute for the functions that the formal ones are unable to perform.

[16] http://www.ifad.org/governance/index.htm

[17] http://lnweb90.worldbank.org/eca/eca.nsf/Sectors/ECSPE/E9AC26BAE82D37D685256A940073F4E9?OpenDocument

[18] http://lnweb90.worldbank.org/eca/eca.nsf/Sectors/ECSPE/E9AC26BAE82D37D685256A940073F4E9?OpenDocument

Corruption and its impacts

In the economy, corruption is the source for encouraging inefficiency, embezzling money and resources, wrongful allocation of scarce resources, increasing revenue losses, decreasing investment opportunities, privileging non-productive rent seeking activities, and fuelling up underdevelopment and distorted growths.[19] These things together add up to poor governance, which in turn affects state capacity. This also has its bearing on disaster risk reduction policies and actions. Corruption, in its turn, affects disaster preparedness in two ways – directly and indirectly. A direct effect of corruption on disaster can be observed, for instance, when sea sand is used in construction works, because it is cheap. However, sea sand quickly rusts and weakens the rods used in the building structure[20]. Low investment in public services due to institutional corruption is an example of indirect effect.

This puts the concept of corruption at the center of this study and requires that we look at corruption more deeply and form a concrete understanding to how corruption is linked with public policy making and eventually its effects on disaster preparedness. To achieve this, we will try to clarify the following questions - what is corruption, its causes, relevant agents in corruption, and role of state in sustaining corruption.

To try and frame the concept of corruption is no simple task as it is subject to individual understanding. This view is also shared by Rose Ackerman (2004, p. 207) as he writes – corruption is a term whose meaning shifts with the speaker. Begovic

19 "International Conference on: Institutions, Culture and Corruption in Africa / CODESRIA." 2015. Accessed June 13. http://www.codesria.org/spip.php?article354.

20 "Expert Warns against Use of 'Sea Sand' in Construction." 2014. Antigua Observer Newspaper. Accessed September 22. http://antiguaobserver.com/expert-warns-against-use-of-sea-sand-in-construction/.

(2007, p.51) provides a more balanced definition of corruption as he approaches corruption to be “a behavior that spreads away from a certain norm; whereas the norm is defines as a set of legislative, public interest or public opinion criteria”. This definition, however, suffers from two types of limitations – i) different judicial systems interpret corruption in different ways since judicial systems are constructed within a particular social system, therefore leaving a huge gap in standards between judicial systems and can result in establishment of particular laws that are not favorable in eradicating corruption; and ii) this definition is limited to judicial point of view and does not cater for incorporating sociological and economical explanations. For a more nuanced conceptualization of corruption, we need to turn to Tanzi (1998, p. 6-7) who says that – corruption exists “if there is an intentional violation of the principle of impartiality in the process of the decision making in order to appropriate a benefice,” he adds – “corruption is an abuse of the public power for private benefits.”

Let us now look at possible causes behind corruption. Academicians have tried to come up with a comprehensive list of causes for corruption and thus have provided many lists. Begovic (2007, p.135) proposes a number of causes which are as follows: rents, size of the state, incitation to the public functionaries, pressure from the civic society, extent of democracy,culture and tradition Economic (in)equality.

Economic impact of corruption

In general development discourse on corruption is one of the most pressing problems which is identified as a hindrance in promotion of effective governance and economic growth. This is truer in the case of developing countries like Bangladesh, This country has a history of corruption and has been taking the first position in corruption index from 2001 to 2005 according to transparency international. Corruption also has an important relationship with state capacity. It should be

remembered that state capacity is also linked to distribution of goods by the government and in natural disaster it is often seen that distribution of goods becomes an issue which introduces corruption as a factor. Below I mention three major impacts of corruption on economy.

A. Loss of efficiency

"Corruption can have efficiency consequences" (Benjamin and Rohini 2012, p.16) and this takes place mainly in the following two ways:

1) Direct loss

Due to corruption, there is an increase in the cost of government goods which eventually raise the prices of goods and services and thus decreasing government's intention in providing people with services that they are eligible for. This happens when corruption increases the price of the projects that were supposed to be delivered at low cost. In some cases, these projects are even called off operation by labeling them a failure. Olken (2006) in his case study of Indonesia showed how corruption was responsible for a substantial loss of money that was supposed to be used for the anti poverty program. He performed quantitative studies including and excluding corruption to show how huge the loss is (Benjamin and Rohini 2012, p.16).

2) Indirect loss

This type of loss takes place when government officials does not steal directly but adopts other ways to extract money. Such types of loss leads to inefficiency, as the money required for a project to be successful is not fully used on the project, rather the money is embezzled by the officials (Olken and Pande 2102, p. 16).

B. Reduced economic growth

Numerous academicians have underlined the significant connection between economic growth and corruption. For instance, Pellegrini and Gerlagh (2004, p.7)

show the significance of corruption on the growth. Lowered economic growth then lowers a state's capacity and quality of investment in public infrastructure – the projects are more expensive and worse maintained than they could have been in absence of corruption.

C. Low Foreign direct investment (FDI)

Studies have found commercial openness to be lower in corruption-ridden countries than in corruption free countries. This happens mainly for two reasons - where there is significant corruption, the local producers might be interested in pushing for higher commercial barriers, in order to protect themselves from the international competition.

Habib and Zurawicki (2001) records that, since local investors are better informed, the impact of corruption on their business is less substantial. Begović (2007, p. 332) stipulates that in a country where corruption is rampant, the international investors will look for the local partners, because they are better informed; for it is in this joint venture with the local partners that the international investors are seeking to lower the transaction costs. Again, Smarzynska and Wei (2000) showed that, when corruption is high, FDI will take the form of investment in production of low technology goods and services. Al Sadig (2009) studied 117 countries and concluded that, a 1% decline in corruption leads to a 20% increase in FDI.

All the above causes are indicative of how corruption is responsible for lowering economic growth and development. Studies show that rich countries are less vulnerable to natural disasters than poor countries. And one of the most pressing factors for this difference is the difference in state capacity. This again

eventually opens up the window of corruption which is responsible for this difference in governance and state capacity.

Corruption and Bangladesh: Some Examples

Dr. Iftikhar-ul-Awwal in *The Daily Star* [21] publishes a small account of Bangladesh's corruption in 2000 on August 22, 2001[22] -

- 70 per cent of the government grants for village infra-structural development (for the year 2000-01) amounting to about 331 crore[23] taka worth of wheat remains unaccountable. (Janakantha[24], 30-7-01)
- Financial irregularity, corruption and plunder of about 900 crore taka in 28 projects of public Health Engineering Directorate under the Ministry of Local government. (Janakantha, 30-6-01)
- Cabinet discussed ways and means to check corruption which cost the country Tk. 12,000 crore annually. GDP growth rate would have increased by 4 per cent had this money been used in development work. (Janakantha, 23-6-01)
- Government grants meant for teachers and staffs of educational institutions are misappropriated to the tune of nearly 35 per cent by management of these institutions. (The New Nation, 22-6-01)
- Government revenue amounting to Tk. 6,718 crore misappropriated by fraudulent groups through deception. (Janakantha, 1-6-01) Corruption cost the country Tk. 17,191 crore in the year 2000. (Janakantha, 18-5-01)
- Fifty customs officers own property worth Tk. 200 crore. (Janakantha, 16-1-01)
- The issue of distribution of government plots termed a black chapter of AL[25] regime. (Janakantha, 22-12-2000)
- An investigation on the unspecified sources of income of policemen conducted by the Bangladesh Society for the Enforcement of Human Rights found 80 cases in which offices had became millionaires during their periods of service. (The Independent, 17-4-99)

[21] Bangladesh's most popular and widely circulated English news daily

[22] "'Pervasive Corruption: Time to Introspect', Published in the The Daily Star Bangladesh), August 22, 2001." Accessed November 23, 2014.

[23] 1 crore = 10 million

[24] Dainik Janakantha, a popular national daily in Bangla

[25] Bangladesh Awami League, one of the two largest political parties in Bangladesh, served two full time at the government: first, 1996 to 2001; second, 2008 to 2013; and are currently in power following widely criticized January 2014 national elections

- Hundred police officers own property worth Tk. 300 crore. (Janakantha, 16-4-99)

Table 1 shows Bangladesh's performance in terms of fighting corruption, according to Transparency International's Corruption Perception Index, over the past 10 years.

Table 1: Corruption in Bangladesh according to CPI (TI)

Year	Bangladesh	India	Pakistan	Sri Lanka	Nepal	Bhutan
2013	136 (16th)	94	127	91	116	31
2012	144 (13th)	94	139	79	139	33
2011	120 (13th)	95	134	86	154	38
2010	134 (12th)	87	143	91	146	36
2009	139 (13th)	84	139	97	143	49
2008	147 (10th)	85	134	92	121	45
2007	162 (7th)	72	138	94	131	46
2006	156 (3rd)	70	142	84	121	32
2005	158*	88	144	78	117	-
2004	145*	90	129	67	90	-
2003	133*	83	92	66	-	-
2002	102*	71	77	52	-	-
2001	91*	71	79	-	-	-

* Most corrupt country in the world[26] *http://www.transparency.org/country*

Figure 9 to 14 show Bangladesh's position relative to the other five South-East Asian countries according to the six governance indicators by the World Bank popularly known as the World Governance Indicators.

i. Control of corruption (in percentile)

[26] Inclusion of a country in the TI report requires at least three reliable surveys; in Bangladesh's case, the three reports were – the Business Environment Survey 2001 conducted by the World Bank, Global Competitiveness Report 2001 of World Economic Forum, and Economist Intelligence Unit 2001.

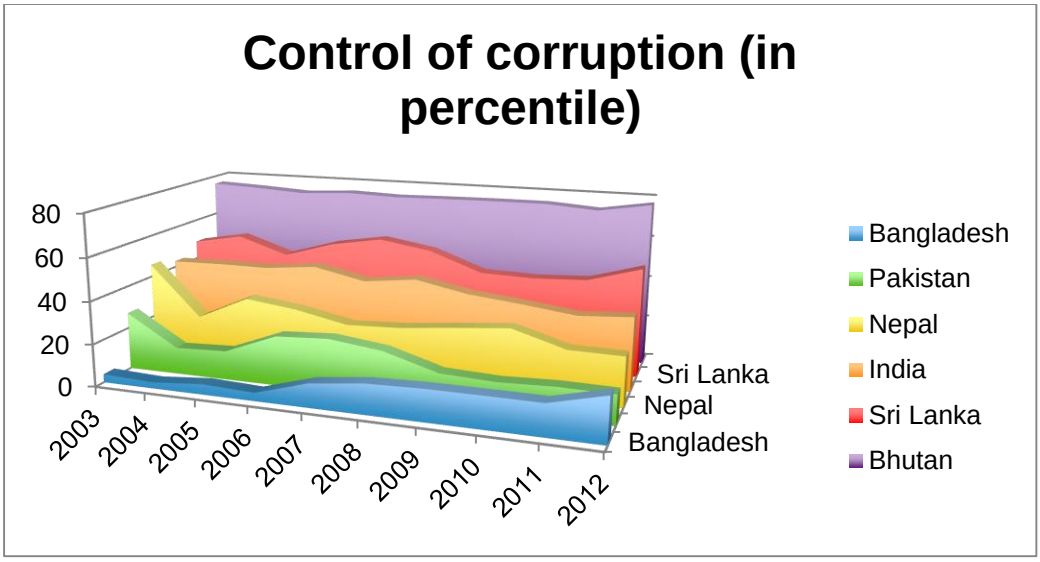

Figure 9: Control of Corruption (in percentile)[27]

In this indicator, Bangladesh is only marginally better than Pakistan with the highest difference being 7.1 in 2012.

ii. Governance effectiveness (in percentile)

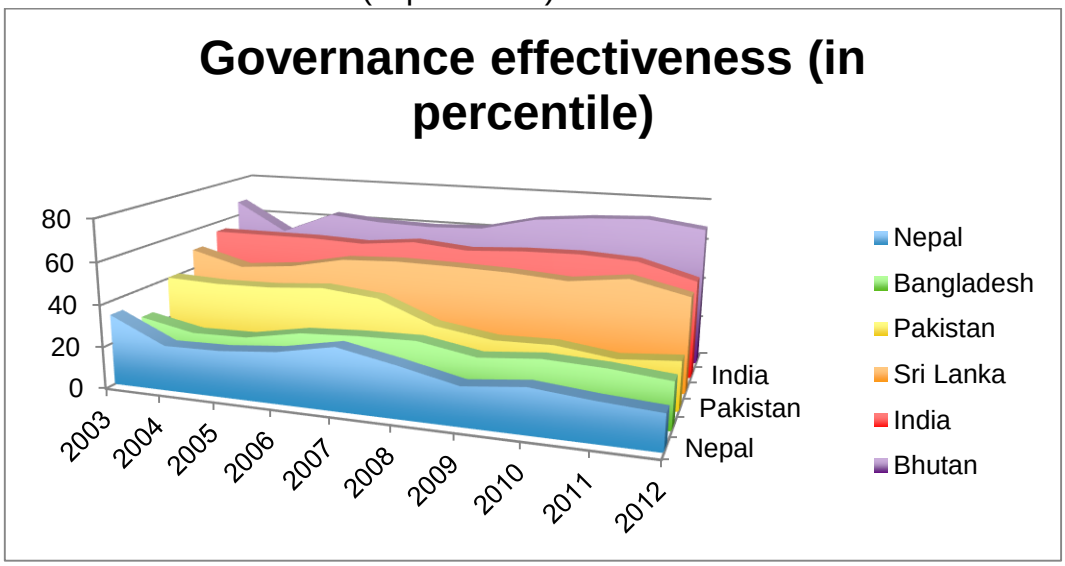

Figure 10: Governance effectiveness (in percentile)[28]

In this indicator, Bangladesh is only marginally better than Nepal with the highest difference being 6.1 in 2011.

iii. Political stability and absence of violence/terrorism (in percentile)

[27] Worldwide Governance Indicators, The World Bank
[28] Worldwide Governance Indicators, The World Bank

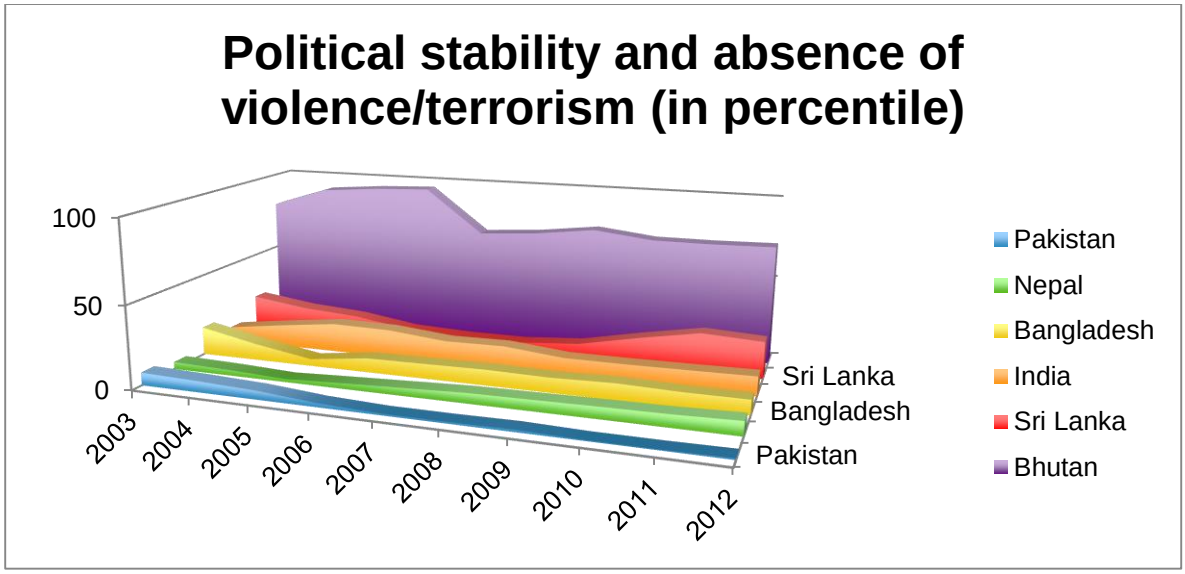

Figure 11: Political stability and absence of violence/terrorism (in percentile)[29]

In this indicator, Bangladesh seems to be doing slightly better than Pakistan and Nepal.

iv. Regulatory quality (in percentile)

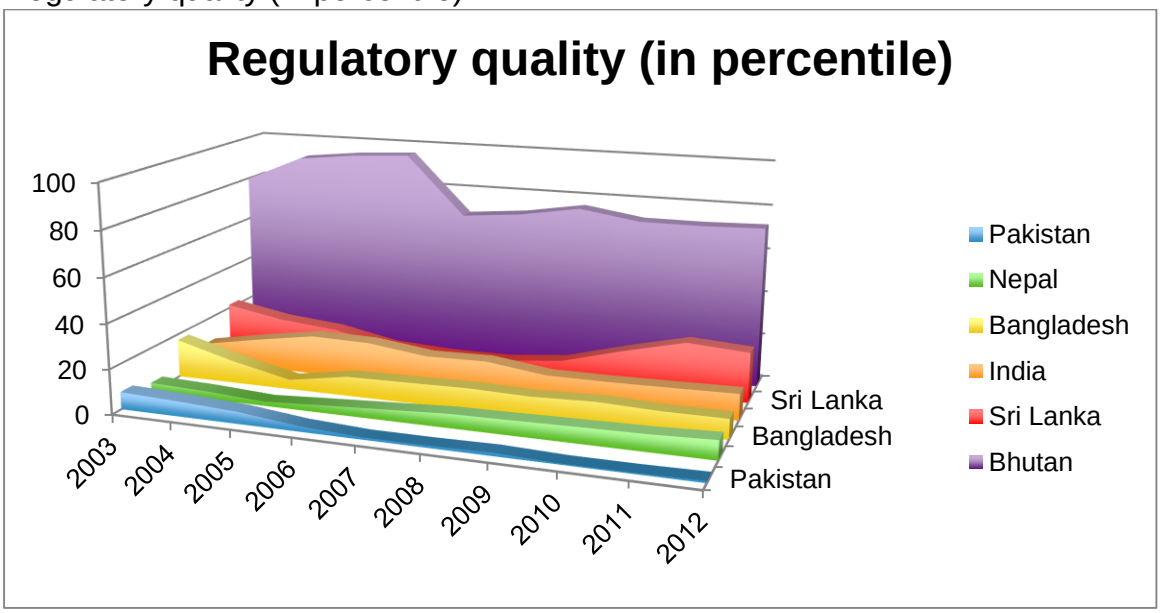

Figure 12: Regulatory quality (in percentile)[30]

In this indicator, again, Bangladesh is slightly better placed ahead of only Pakistan and Nepal.

v. Rule of law (in percentile)

[29] Worldwide Governance Indicators, The World Bank

[30] Worldwide Governance Indicators, The World Bank

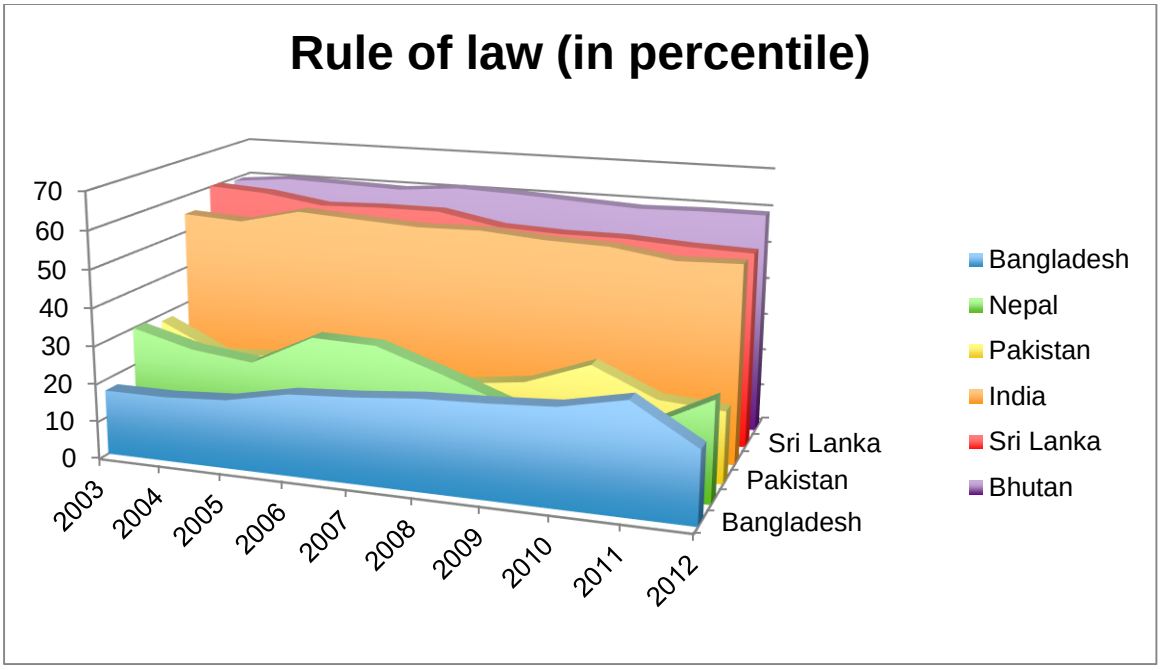

Figure 13: Rule of law (in percentile)[31]

In this indicator, Bangladesh seemed to maintain a steady recovery rate since 2003 till 2011. This, however, has been lowered in 2012.

vi. Voice and accountability (in percentile)

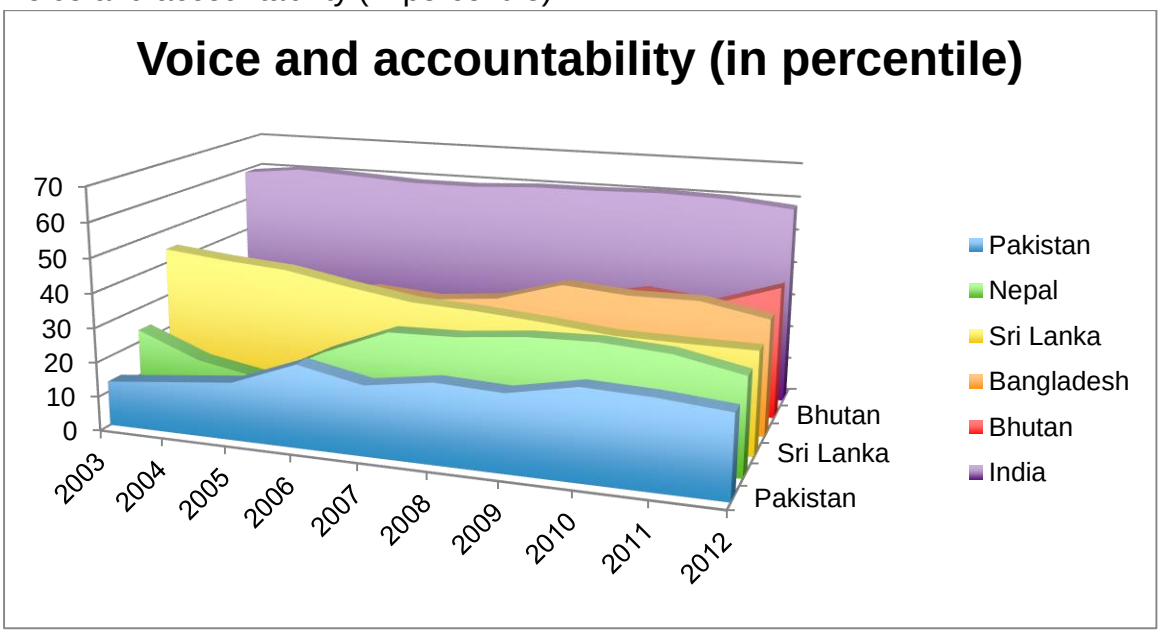

Figure 14: Voice and accountability (in percentile)[32]

[31] Worldwide Governance Indicators, The World Bank
[32] Worldwide Governance Indicators, The World Bank

In this indicator, Bangladesh seems to me seems to be doing better pulling up the rate from 2009 – 2010.

All these six different indicators show that Bangladesh is not doing too well and constantly being placed in the bottom half among the six South-East Asian countries. However, there seems to be a slightly upward growth in most of the above indicators. To put this upward growth into perspective, let us now look at how Bangladesh is perceived by anti-corruption authorities, donors and other international agencies in the recent past:

TIB (Transparency International Bangladesh) reports in *Positive and Negative Roles of the Members of the 9th Parliament: A Review* – "97 per cent lawmakers were involved in negative activities which include influencing administrative decisions in undue manner, controlling educational institutions, misusing development allocations, supporting or getting involved in criminal activities, influencing public procurement, violation of electoral rules, managing plot allotment with false information and others." (2012) The most damaging has been retention of Railway Minister Mr. Suranjit Sengupta of the cabinet after a scandal involving bribes worth Tk. 70 lakh[33] (International Crisis Group report *Back to the Future,* 13 June 2012). Corruption seems to have penetrated the governance system and is operating through all its institutions including the judiciary and law enforcing agency. Asian Human Rights Commission reports in *Bangladesh: People pay more to the police than to their government* – "To keep the police subservient to the ruling elite the government has kept the salary of the police force very low. This opens the floodgates and serves as incentive for the police officers to demand and accept bribes. Impunity provided to the force against prosecution for corruption and all other

[33] 1 lakh = 0.1 million

crimes these officers commit is returned by the force by undertaking cleanup work for the ruling elite, most often by 'dealing' with political opponents." (2012) A Freedom house report on Bangladesh confirms that corrupt politicians influence natural course of the judiciary – "a series of apparently biased decisions in corruption cases raised concerns about political influence over the judiciary." ("Bangladesh | Freedom House." 2015.) [34] The same report concludes that widespread corruption in all government institutions undermine it's own credibility – "Endemic corruption and criminality, weak rule of law, limited bureaucratic transparency, and political polarization have long undermined government accountability."

The above discussion with all the graphical illustrations shows that the state institutions in Bangladesh is still fragile with a clear label of underdevelopment prominently oozing out of the structure. The combination of inefficient policy makers, corrupt politicians and a dumb-headed bureaucracy has made conditions irreparable. The restoration of democracy was thought as a positive change but with rampant corruption and unmotivated leaders the country has hardly taken a step ahead. This is evident from the level of losses they suffer from the natural disasters that strike the country every year.

Chapter 4: Data Analysis

With the objective of exploring whether corruption plays a significant role in exacerbating disaster vulnerability to natural disasters or whether a lack of state capacity is the main culprit, I have approached to test my hypothesis in three levels –

Level 1: Data from Bangladesh

Framework

[34] "Bangladesh | Freedom House." 2015. Accessed June 15. https://freedomhouse.org/report/freedom-world/2012/bangladesh#.VX85ofmqqko.

To test my hypothesis, I have selected eight Southern districts in Bangladesh to collect information from. The information have been collected from two types of respondents – those who were affected by cyclone Sidr, who will be referred to as 'affected' from here on; and Red Crescent Youth (RCY) volunteers. Information has been collected through relevant questionnaires which could be found in Appendix I. Of the eight districts, I have formed two clusters: cluster 1 – those districts who have been most affected from cyclone Sidr, namely Pirojpur, Patuakhali, Barguna, Bagerhat; and cluster 2 – randomly selected four other from medium affected districts, namely Bhola, Barisal, Jhalkathi, Madaripur. A total of two hundred respondents have been interviewed from the eight districts (25 x 8 = 200) with twenty-five respondents from each. Of the twenty-five, thirteen affected people and twelve RCY have been interviewed.

Table 2: District-wise data collection distribution

Cluster	**Districts**	**Type and number of respondent**	**District total**
Cluster # 1	Bagerhat	Affected people = 13 RCY = 12	25
	Barguna	Affected people = 13 RCY = 12	25
	Pirojpur	Affected people = 13 RCY = 12	25
	Patuakhali	Affected people = 13 RCY = 12	25
Cluster # 2	Barisal	Affected people = 13 RCY = 12	25
	Bhola	Affected people = 13 RCY = 12	25
	Jhalkathi	Affected people = 13 RCY = 12	25
	Madaripur	Affected people = 13 RCY = 12	25
		Total =	**200**

Reason behind selecting affected people and RCY is that the affected people could provide information on the recipient side of the emergency relief operations. Through RCYs, who form an important part of their respective local Red Crescent Society Branch offices, I hope to collect information on possible instances of corruption (i.e. bribe, nepotism, embezzlement). I expect that the collected data from these two types of respondents would provide me with enough quantitative evidence to explore potential correlation behind districts in the two clusters having different number of lives lost. For this level, dependent variable of my quantitative analysis would only be lives lost as district-wise breakdown of financial losses is not available.

To start the analysis, let us look at the affected districts of Bangladesh. According to Ministry of Flood and Disaster Management (MoFDM) Bangladesh, death toll in the twelve most affected districts from Sidr is presented in table 2 in clusters which will assist in comparing between most affected and medium affected districts -

Table 3: Relative information on the selected 8 districts of Bangladesh

Cluster	District	Death count	Population Density (sq. km.)[35]	% Poor	% Extreme Poor[36]
#1	Barguna	1335	711	57.8	39.1
	Bagherhaat	810	644	43	31.9
	Patuakhali	457	769	60	47.3
	Pirojpur	400	594	28	18.2
#2	Barisal	97	896	57.7	41.1
	Jhalkathi	47	693	47	28.5
	Bhola	42	580	51.1	31.8
	Madaripur	41	1099	38.5	25.9

Source: http://www.bbs.gov.bd/Census2011, BBS Incidence of Poverty 2005, MoFDM

[35] "Super Cyclone Sidr Pg. 8; calculated by extrapolating Population Census data from 2001 (BBS) using the national growth rate (2001–2007)

[36] measured with 2122 kilo calorie threshold

From table 2, we can see that there is no potential correlation between death count and population density. Intuitive explanation would be that death toll was higher in those districts who came first in the path of the cyclone, and it gradually got lowered as the cyclone moved inwards and weakened.

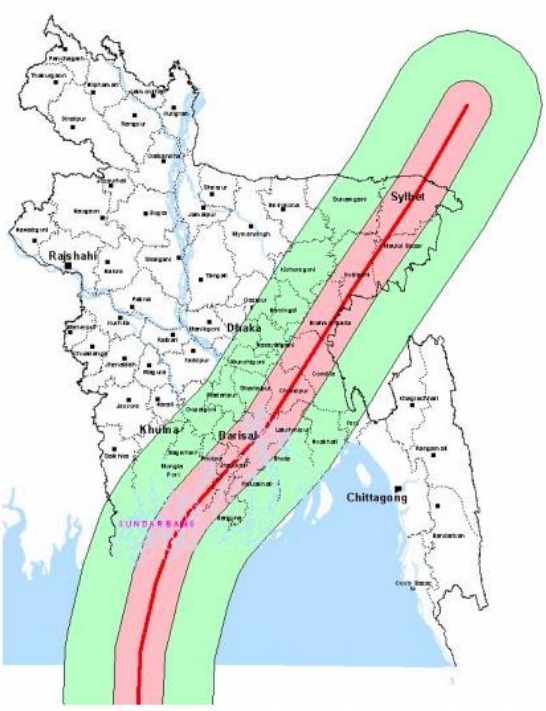

Figure 15: Destructive path of cyclone Sidr

Source: Super Cyclone Sidr: MoFDM[37]

We can also see from table - 2 that all the affected districts have high ratio of poverty. The poor especially have disadvantage over land in that they have none and are forced to live in government lands, often on the bank of rivers and other low-laying lands especially making them vulnerable to such natural hazards as floods, storms and cyclones. In line with this, the following two figures will show the potential correlation between poverty and vulnerability to hazards.

In the following two figures, the big circular area on North Western part of Bangladesh is popularly known as 'monga' areas and the smaller area marked with

[37] Super Cyclone Sidr: Impacts and Strategies for Interventions, February 2008 http://www.preventionweb.net/files/9470_cyclonebangladesh.pdf

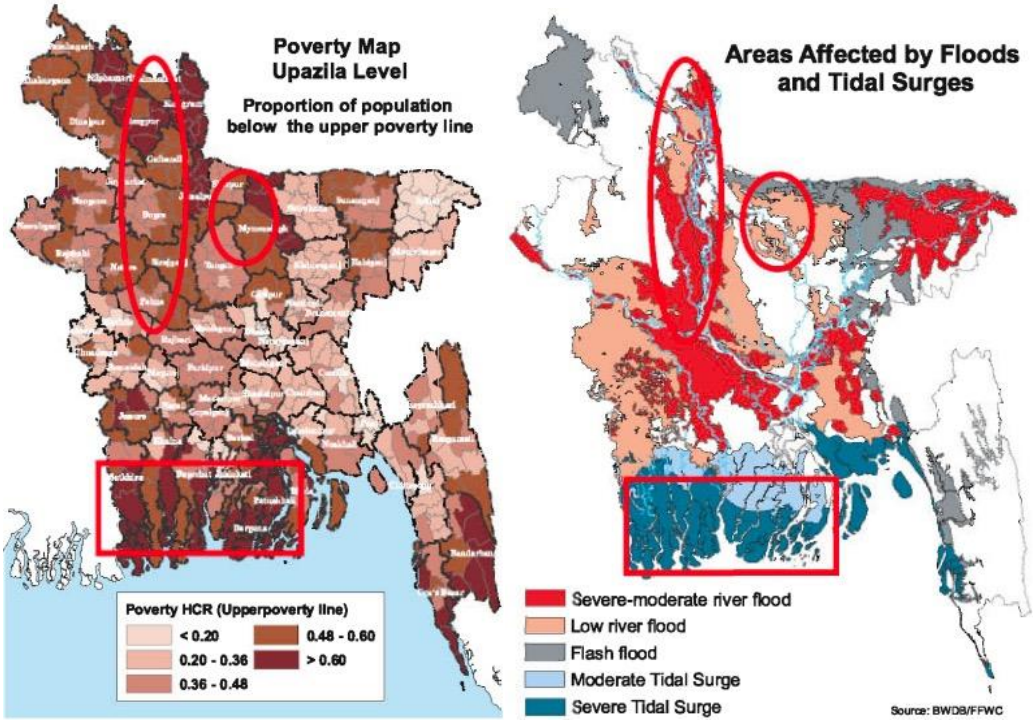

Figure 16: Mapping poverty and hazard vulnerability[38]

a circle is 'char' areas. Both these areas are susceptible to flash flood. The Southern low lands, marked with a square, are more susceptible to cyclones and tidal surges. So, we can see a correlation between poverty and vulnerability to hazards. Consequently, I will look at poverty as an important determinant of disaster vulnerability as I compare differing levels of affectedness between Bangladesh and two Indian states. The comparison will be focused on eight Southern affected districts of Bangladesh with the two Indian states – West Bengal and Orissa.

[38] "Updating Poverty Maps of Bangladesh." 2009. Bangladesh Bureau of Statistics and the World Bank. http://www.bbs.gov.bd/WebTestApplication/userfiles/Image/LatestReports/UpdatingPovertyMapsofBangladesh.pdf.

Regression output tables: Data from Eight Districts of Bangladesh

Table 4: Data collected from Affected people

	Cluster # 1: Most-affected districts					Cluster # 2: Medium-affected districts				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
VARIABLES	same_rel	relocated	relief_status	rec_cash	money	same_rel	relocated	relief_status	rec_cash	money
age	-0.004	0.003	0.004	0.016	26.546	-0.002	-0.013	0.007	0.008	-0.475
	[0.002]	[0.008]	[0.006]	[0.008]**	[35.365]	[0.005]	[0.010]	[0.004]	[0.008]	[22.473]
male	-0.025	-0.308	0.023	-0.184	1,019.475	0.003	0.115	-0.122	0.031	-20.064
	[0.050]	[0.167]*	[0.125]	[0.160]	[715.583]	[0.109]	[0.191]	[0.086]	[0.158]	[504.648]
rel_islam	-0.025	0.153	0.045	0.042	856.677	0.038	-0.119	0.002	0.156	-321.391
	[0.046]	[0.151]	[0.114]	[0.145]	[611.582]	[0.107]	[0.187]	[0.084]	[0.155]	[560.369]
fam_mem	-0.001	-0.066	-0.035	-0.080	-37.489	0.011	-0.009	0.012	-0.069	-265.586
	[0.017]	[0.057]	[0.043]	[0.055]	[256.266]	[0.039]	[0.068]	[0.031]	[0.057]	[175.394]
vul_all	0.147	0.073	0.281	0.254	-236.448	0.169	-0.081	-0.079	0.256	3,199.380
	[0.059]**	[0.195]	[0.147]*	[0.188]	[798.718]	[0.142]	[0.249]	[0.112]	[0.206]	[706.893]***
income_percapita	-0.000	0.000	-0.000	-0.000	0.409	-0.000	0.000	-0.000	-0.000	-0.794
	[0.000]***	[0.000]	[0.000]***	[0.000]	[0.498]	[0.000]	[0.000]	[0.000]	[0.000]*	[0.385]**
rich	-0.006	-0.243	0.219	0.385	-1,941.919	-0.081	-0.454	0.022	-0.088	-1,340.098
	[0.080]	[0.265]	[0.200]	[0.255]	[1,142.127]	[0.111]	[0.194]**	[0.087]	[0.161]	[441.457]***
injured	-0.012	-0.049	-0.171	0.042	168.838	0.009	0.016	0.030	-0.050	95.057
	[0.064]	[0.212]	[0.160]	[0.204]	[863.347]	[0.074]	[0.129]	[0.058]	[0.107]	[341.661]
death	-0.024	-0.317	0.046	-0.292		0.077	-0.449	0.091	0.216	
	[0.103]	[0.339]	[0.255]	[0.326]		[0.411]	[0.720]	[0.323]	[0.597]	
most_damage	-0.024	0.223	-0.007	-0.285	983.986	-0.083	-0.416	0.106	-0.879	
	[0.082]	[0.271]	[0.204]	[0.260]	[1,285.941]	[0.286]	[0.501]	[0.225]	[0.416]**	
damage	-0.024	0.024	0.010	-0.001	1,064.599	0.035	-0.092	-0.113	-0.095	760.410
	[0.045]	[0.147]	[0.111]	[0.142]	[591.420]*	[0.114]	[0.199]	[0.089]	[0.165]	[561.855]
corrupt	-0.963	-0.252	-0.254	-0.268	51.035	-0.894	-0.001	-0.109	-0.079	1,938.071
	[0.052]***	[0.172]	[0.129]*	[0.165]	[859.718]	[0.108]***	[0.189]	[0.085]	[0.157]	[548.775]***
Observations	50	50	50	50	35	50	50	50	50	39
R-squared	0.945	0.328	0.363	0.313	0.494	0.773	0.304	0.442	0.375	0.793

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Table 5: Data collected from RCY volunteers

	Cluster # 1: Most-affected districts		Cluster # 2: Medium-affected districts	
	(1)	(2)	(1)	(2)
VARIABLES	get_shelter	same_relief	get_shelter	same_relief
unit_resp_plan	0.038	-0.244	-0.132	-0.317
	[0.169]	[0.147]	[0.139]	[0.130]**
shelter_mgt_plan	-0.320	0.433	0.001	0.305
	[0.165]*	[0.144]***	[0.132]	[0.123]**
maltreatment	-0.116	-0.012	-0.184	-0.181
	[0.175]	[0.153]	[0.157]	[0.147]
corrupt	0.250	0.164	-0.093	-0.022
	[0.270]	[0.235]	[0.152]	[0.142]
Observations	49	49	48	48
R-squared	0.090	0.285	0.091	0.253

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Regressing the data collected from the affected people in the eight districts in two clusters, I had the following as dependent variables – being able to relocate to cyclone shelter, receiving relief, receiving same relief items, receiving cash relief, and amount of cash received as emergency relief. As independent variables, I have the following – age, gender (male), religion (Islam), size of household, status of vulnerability, per capita income for respondent based on number of their family members, level of poverty, injury, death, level of damage, and presence of corruption.

From regression results presented in table 4, I found that there is statistically significant (at 10% and 5% level) positive correlation between vulnerable people receiving emergency relief living in cluster - 1 districts. Here, I assigned vulnerability status to those who responded that they have been in the past affected from at the three types of disasters out of five different types.

I also found, from the same table, that presence of corruption, defined by nepotism, bribe and embezzlement, showing high statistical significance at 1% level while being negatively correlated with receiving same types of emergency relief and getting relief at all. Presence of corruption has the same effect in both clusters.

Being male, I found, is negatively correlated with relocation at 10% significance level. This means that women were given more preference while being relocated. Relatively better-off households also faced this biased treatment while relocating. Also, age increases the chance of getting cash relief.

Interestingly, households with more damage, identified by their damage of house, crops, and cattle, tended to get more of cash relief in cluster 1 districts compared to cluster 2 districts. Whereas most damaged households in cluster 2, actually received less cash relief. This result is further emphasized as regression

results with vulnerable people in cluster 2 which show that the vulnerable received less cash amount as relief. Intuitive explanation of this could be that members from the poorest strata were easy to leave out while distributing cash relief in cluster 2 than in cluster 1. Media presence, national and international attention may have instigated this. We, however, did not get any such indication from RCY volunteer responses. Explanation of this could be that since they were involved in the relief distribution process, and has realistic idea about how much cash flowed in and criteria for being considered for receiving cash relief, they did not site corruption to be a major cause.

To sum up, we can see that presence of corruption is a key factor as it reduces chances of receiving emergency relief. However, when it comes to the affected people, they tend to blame it on the relief distribution officials and their corruption. While we look at quantitative analysis of data collected from the affected people, we need to discount for the fact that there is a time gap of eight years between cyclone Sidr and when the data was being collected consequently exposing objectiveness of their responses. For instance, in case of receiving same relief items, not every item is required by all households depending on their level of damage and therefore it might be translated by the recipients as biased treatment on the officials' part. It would be interesting to see how far the role of corruption is supported in the subsequent section as I analyze cross-national data.

Level 2: The case of India (West Bengal and Orissa)

In this section, after a comparison of two clusters of most-affected and medium-affected districts in Bangladesh, I will explore possible reasons behind

differing outcomes between Bangladesh and the two Indian states – West Bengal and Orissa.

Table 6: Relative information on the two states of India

District	Death count	Population Density (sq. km.) 2001[39]	Absolute increase 2001[40]	% Poor 2005[41]
West Bengal	0	903	58	34.3
Orissa	0	236	58	57.2

Source:

India and Bangladesh both suffered the wrath of cyclone Sidr on 15th November 2007. The cyclone had hit both Bangladesh and India. But there was huge differences regarding loss and damage between both the countries. Preparedness by India and Bangladesh also differed in capacity and planning. India had a much higher level of preparedness. After the warning was disseminated by the Indian Meteorological Department, thousands of people along the coast in both the states were evacuated to cyclone shelters built along the coastline. They were kept in these shelters till the warning was called off. Also the fishermen were advised to stay clear of the coastline in both states. From government sources and newspaper reports, it was clear that India suffered minimal losses. There was absolutely no report of human life loss in India.

The cyclone, which built up in the Bay of Bengal, crossed the states of Orissa and West Bengal in India before reaching Bangladesh. In India, following a warning raised by the Indian Meteorological Department, thousands of people along the coast in both the states were evacuated to cyclone shelters built along the coastline.

[39] http://populationcommission.nic.in/content/934_1_Densityofpopulation.aspx

[40] http://populationcommission.nic.in/content/934_1_Densityofpopulation.aspx

[41] Tendulkar Methodology, Sukhadeo Thorat "How Socially Inclusive Has Growth Been?" Presidential Address at the 93rd Annual Conference of the Indian Economic Association. 22 December 2014, p. 103

They were kept in these shelters till the warning was called off. In addition, fishermen were advised to stay clear of the coastline in both states. No deaths were reported from the state, but houses and standing crops were destroyed in the coastal areas of the South and North 24 Parganas districts. Approximately 100 IRCS volunteers were mobilized to help the affected people. The state disaster management coordinator shared information with state disaster response team members in Medinapur, 24 Parganas (south and north). Also in Orissa another hard hit district reported no loss of life and this should be awarded to the high level of preparedness shown by the state level management with the help of local Red Cross society. On the 15th of November, before the actual time around 8,000 community members from low lying coastal villages in Balasore, Kendrapara, Jagatisingpur, Puri and Ganjam districts were evacuated and accommodated in cyclone shelters, which were stocked with dry food, dry clothes and drinking water by the local Panchayats. (“India: Cyclone Sidr”, 2007) Whereas Bangladesh suffered heavy losses both in terms of finance and human lives. This difference can be understood as the two countries differed hugely in their state capacity and governance indicator measurement.

Figure 17 indicates contrast between the state capacity of India and Bangladesh. All the indicators show that India performed much better than Bangladesh in all areas of governance. Figure 17 presents a graphic to contrast between Bangladesh and India as they performed in 2007 following the six governance indicatorsused by the World Bank, namely Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. All the indicators show that India has performed much better in every aspect. This is also an indicator of India’s greater

state capacity and explains why India was much less vulnerable during the natural disaster of 2007.

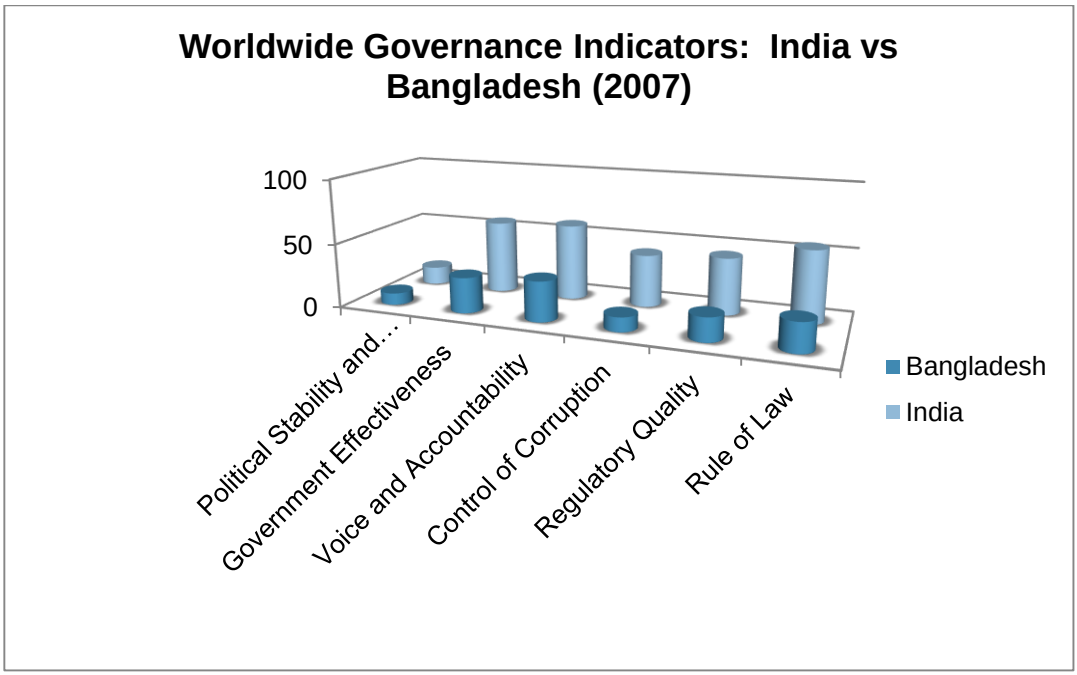

Figure 17: Worldwide Governance Indicators: India compared with Bangladesh[42]

Figure 17 presents Human development Index of two countries and shows that India has consistently performed much better than Bangladesh. This also indicates that the state capacity of India is indeed much stronger compared to Bangladesh, which has helped them prepare better.

[42] "Worldwide Governance Indicators, 2014 - Knoema.com." *Knoema*. Accessed June 11, 2015. http://knoema.com/WBWGI2014/worldwide-governance-indicators-2014?country=1000160-bangladesh.

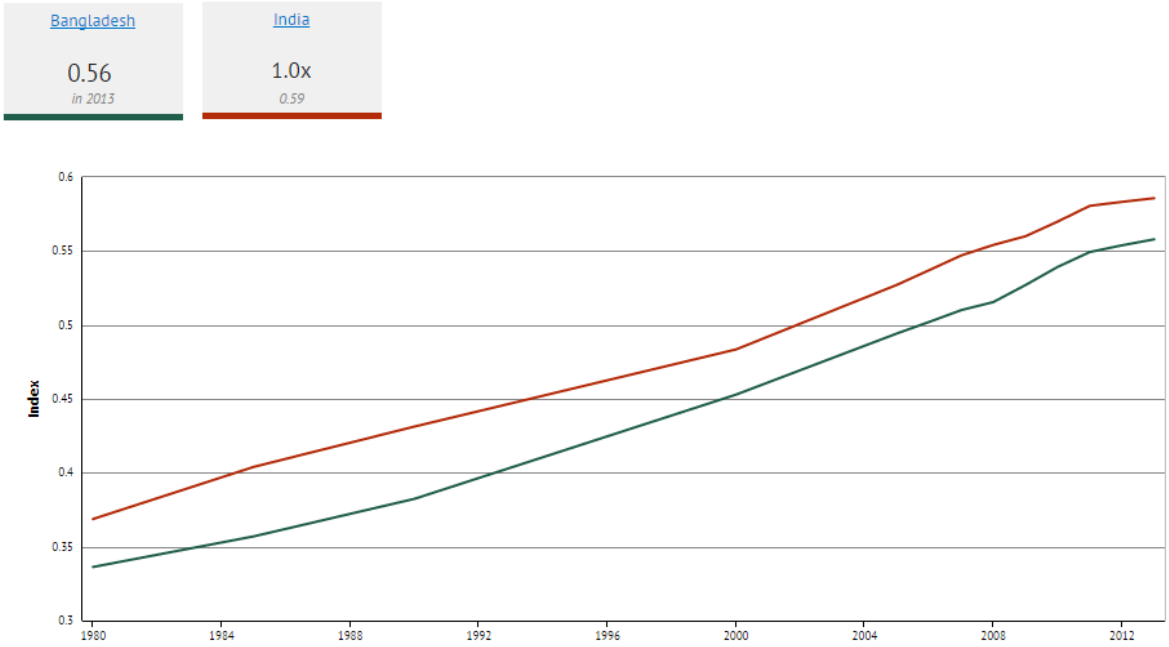

Figure 18: Human Development Index (1990 - 2013)

Source: KOEMA[43]

This comparison establishes that state capacity is a key factor that may have contributed towards poor performance by Bangladesh in preparing for cyclone Sidr. At this stage, it would be critical to see whether cross-national data locates corruption as the main evil or is it a lack of state capacity.

Level 3: Cross-national data

To regress cross-national data, the following linear model has been adopted -

Regression formula:

i. total death = $\beta_0 + \beta_1 X_i + \beta_2 X_2 + \beta_3 X_3 + u_i$

ii. total damage = $\beta_0 + \beta_1 X_i + \beta_2 X_2 + \beta_3 X_3 + u_i$

Where,
β_0 = intercept
β_1 = coefficient of corruption
β_2= coefficient of state capacity
β_3 = other indicators
u_i= error term

In this section, I will list brief description of the dependent and independent variables -

- Dependent variables:

[43] "Bangladesh - Human Development Index." *Knoema*. Accessed June 12, 2015. http://knoema.com/atlas/Bangladesh/Human-Development-Index?compareTo=IN&action=export&gadget=indicator-preview-host.

i. **Log of total death:** This is the measure of number of deaths in the disaster phenomena.

ii. **Log of total damage:** This is the measure of total amount of damage in disaster phenomena.

- Independent variables:

i. **Corruption Perception Index (CPI):** This index is published by Transparency International (TI) every year. The CPI index is measured by perceived levels of corruption in each participating country determined through expert assessments and opinion surveys. To assist with my cross-national regression, I have calculated a moving average taking data from 2001 till 2007.

ii. World Governance Indicators (WGI) defined by Kaufmann et al (2008) are:

a) **Government effectiveness:** This indicator captures opinions about quality of public services, quality of the civil services and extent of their independence from political demands, quality of formulated policies, their successful implementation, and trustworthiness of the government commitments towards its policies.

b) **Control of Corruption**: This denotes popular perceptions about how far public power is employed to extract private gain. This includes all forms of corruption – small and large. This also dons the degree of freedom enjoyed by a state from its elites and their particular interests.

c) **Rule of Law**: This entails perceptions of the extent to which agents in the society feel confident about and agree to abide by the rules of society, for instance, enforcing quality of contract, property rights, regulating authority - the police, and the courts, additionally the probability of crime and violence.

d) **Regulatory Quality**: This indicates perceptions about the government's ability to formulate and implement efficient policies and regulations which warrants and encourages private sector development.

e) **Political stability and absence of violence**: This captures popular perceptions about the possibility of their respective governments being destabilized or ousted through unlawful means or through violence. Violent means includes violence and acts of terrorism which are politically-motivated.

f) **Voice and Accountability**: This indicates the degree of possibility for citizens of a country to be able to participate in choosing their own government, their freedom of expression, freedom of media, and freedom of association.

iii. **Log of GDP per capita**: GDP per capita represents gross domestic product distributed among the population calculated at mid-year. The World Bank defines GDP as –"the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products."[44] For the purpose of regression in this study, I adopted log of GDP per capita for

[44] http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries/HT-xj?display=graph

2007 as this assists with linear regression and additionally helps simplify the model.

iv. **Population density**: this is also taken from the World Bank database calculated by dividing total population against geographic area.

v. **Polity**: this has been taken from Polity IV database where I calculated a moving average taking data from 2001 till 2007. The polity score is calculated by subtracting AUTOC (autocracy) score from DEMOC (democracy) score with the scale ranging between +10 to -10. (Polity IV Project: Dataset User Manual, p.16)[45].

As could be seen from the list of independent variables, there are two different types of corruption measurements which I have used in this study – moving average of Corruption Perception Index by Transparency International between 2001 till 2007, and Control of Corruption from the World Bank (World Governance Indicators – WGI). In successive regressions I have tried to capture the effects of the two separate types of corruption measures and whether they might leave different impacts.

[45] Marshall, Monty G. PhD. 2013. "POLITY IV PROJECT: Dataset Users' Manual." Center for Systemic Peace and Societal-Systems Research Inc. http://www.systemicpeace.org/inscr/p4manualv2012.pdf.

Regression output tables: Cross-national data

Table 7: Regression Y = log_totaldeath

	OLS1 b/se	OLS2 b/se	OLS3 b/se	OLS4 b/se	OLS5 b/se		OLS6 b/se	OLS7 b/se	OLS8 b/se	OLS9 b/se	OLS10 b/se
log_gdp~2007	0.138* (0.061)	0.122* (0.054)	0.146* (0.062)	0.142* (0.058)	0.144* (0.057)	log_gdp~2007	0.128* (0.060)	0.125* (0.055)	0.140* (0.061)	0.143* (0.057)	0.150** (0.057)
Polity	-0.016 (0.013)	0.000 (0.013)	-0.015 (0.013)	-0.014 (0.013)	-0.011 (0.013)	Polity	-0.014 (0.013)	0.000 (0.013)	-0.014 (0.013)	-0.015 (0.013)	-0.011 (0.013)
cpi_moving~g	-0.309 (0.186)	-0.054 (0.130)	-0.279 (0.162)	-0.229 (0.199)	-0.224 (0.136)	corruption~l	-1.279*	-0.147	-0.931*	-1.192	-0.629
gov_effect~s	-0.089 (0.419)					gov_effect~s	0.541 (0.553)				
pol_stabil~e		-0.942*** (0.264)				pol_stabil~e		-0.917** (0.281)			
regulatory~y			-0.196 (0.382)			regulatory~y			0.158 (0.458)		
rule_of_law				-0.293 (0.434)		rule_of_law				0.412 (0.661)	
voice__acc~y					-0.415 (0.299)	voice__acc~y					-0.246 (0.350)
_cons	0.741 (1.743)	-0.160 (1.266)	0.422 (1.698)	0.276 (1.666)	0.233 (1.389)	_cons	-0.362	-0.459	-0.642	-0.681	-0.869
R-sqr	0.106	0.190	0.107	0.109	0.119	R-sqr	0.127	0.191	0.121	0.123	0.124

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Regression, Y = log_totaldamage

	OLS11 b/se	OLS12 b/se	OLS13 b/se	OLS14 b/se	OLS15 b/se		OLS16 b/se	OLS17 b/se	OLS18 b/se	OLS19 b/se	OLS20 b/se
log_gdp~2007	0.424** (0.154)	0.514*** (0.145)	0.540*** (0.158)	0.504*** (0.149)	0.529*** (0.146)	log_gdp~2007	0.400* (0.154)	0.506*** (0.149)	0.541*** (0.159)	0.500** (0.149)	0.516*** (0.148)
Polity	-0.000 (0.033)	0.011 (0.035)	0.013 (0.034)	0.006 (0.034)	0.017 (0.035)	Polity	-0.000 (0.033)	0.007 (0.035)	0.008 (0.034)	0.003 (0.034)	0.015 (0.035)
cpi_moving~g	0.149 (0.471)	0.806* (0.349)	0.900* (0.415)	0.627 (0.510)	0.929** (0.350)	corruption~l	-1.064 (1.361)	1.621* (0.812)	2.049 (1.093)	0.883 (1.705)	2.250* (0.893)
gov_effect~s	1.740 (1.061)					gov_effect~s	3.014* (1.415)				
pol_stabil~e		-0.083 (0.710)				pol_stabil~e		-0.097 (0.761)			
regulatory~y			-0.374 (0.980)			regulatory~y			-0.647 (1.189)		
rule_of_law				0.397 (1.113)		rule_of_law				0.719 (1.718)	
voice__acc~y					-0.522 (0.771)	voice__acc~y					-0.952 (0.907)
_cons	-4.916 (4.418)	-9.904** (3.409)	-10.889* (4.352)	-8.833* (4.273)	-10.757** (3.580)	_cons	-3.775 (3.744)	-6.323 (3.619)	-7.119 (3.862)	-6.107 (3.655)	-6.524 (3.594)
R-sqr	0.253	0.236	0.237	0.237	0.239	R-sqr	0.256	0.228	0.230	0.229	0.235

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Regressoin, Y = total_death&total_damage

VARIABLES	log(Total Damage)					log(Total Death)			
	1a	1b	2	3	4	5	6	7	8
CPI (Moving Average)	1.197								
	[0.259]***								
Corruption Control		2.500	-1.364	-0.271	-0.080	-0.624	-0.840	-1.056	-1.039
		[0.539]***	[1.446]	[1.775]	[1.747]	[0.203]***	[0.532]	[0.656]	[0.662]
Government Effectiveness			4.401	6.636	5.712		1.037	0.348	0.150
			[1.353]***	[2.040]***	[2.007]***		[0.498]**	[0.754]	[0.761]
Political Stability & Absence of Violence			-0.384	0.030	0.111		-0.994	-1.079	-1.046
			[0.728]	[0.787]	[0.788]		[0.268]***	[0.291]***	[0.299]***
Regulatory Quality				-1.299	-2.843			0.438	0.099
				[1.757]	[1.793]			[0.650]	[0.680]
Rule of Law				-2.004	-1.069			0.844	1.064
				[2.508]	[2.474]			[0.927]	[0.938]
Voice & Accountability				-0.510	-0.303			-0.349	-0.288
				[1.063]	[1.058]			[0.393]	[0.401]
log(GDP per capita, 2007)					0.462				0.101
					[0.163]***				[0.062]
Polity (Moving Average)					0.012				-0.000
					[0.036]				[0.013]
Constant	0.942	5.990	5.815	5.794	-5.262	2.724	2.536	2.584	0.165
	[1.104]	[0.521]***	[0.519]***	[0.549]***	[3.901]	[0.196]***	[0.191]***	[0.203]***	[1.479]
Observations	127	127	127	127	127	127	127	127	127
R-squared	0.146	0.147	0.215	0.234	0.289	0.070	0.183	0.196	0.214

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

From the multiple regressions presented in table 7 and 8, I found that, GDP has a strong positive correlation with both dependent variables – total death and total damage. Interestingly, regression of data shows that with higher GDP, we have more deaths and more damage. This output, however, conflicts with results found by UNDP in their report *Linking Disaster Risk Reduction and Poverty Reduction* (2008) which prescribed reduction of poverty as a method for reducing disaster vulnerability, arguing – "94.25% of all people killed by disasters between 1975 and 2000 were from low income or lower-middle income strata." (Bara 2010, p. 2) Though it seems counterintuitive, this needs to be realized that a growth in GDP does not indicate better distribution of wealth or a growth in state capacity. Essentially, the rich may have been acquiring more wealth contributing to growth of GDP rather than overall economic progress. Also, government might engineer its total population to falsely indicate economic progress. When dependent variable is total death, I found positive correlation for all the regressions with a 10% statistical significance level. This correlation becomes significant up to 1% significance level while using total damage as the outcome variable.

From table 8, I also found both Political Stability and Control of Corruption being negatively correlated with total death and this correlation is statistically highly significant at 1% level. So, increase in corruption control index and increase in political stability contributes towards lesser number of deaths. A 1-point increase in political stability index contributes towards 0.92 less death from natural disasters. Whereas, a 1-point increase in corruption control contributes towards 0.93 to 1.28 less death from natural disasters.

While regressing with total damage as dependent variable, as can be seen from table 9, I found that both measures of corruption control, i.e. CPI moving

average by Transparency International and Control of Corruption (WGI) show a positive correlation with significance at 1% level. Both the variables indicate similar effect in that increase in corruption control measure contributes towards an increase in total damage. Intuitive explanation for this could be that with better corruption control there is better distribution of wealth, consequently households report more damage as they had their fair share of wealth damaged. A model further emphasizes this where I have GDP, Polity, Control of Corruption, and Governance Effectiveness as independent variables. In the regression, government effectiveness shows a positive correlation with 10% statistical significance indicating a 1-point increase in government effectiveness leading to a 5.7 point increase in total damage.

Regression results presented in table 9, show that government effectiveness increases financial loss, whereas political stability and absence of violence decreases number of death. Behavior of these two indicators, when regressed with the other WGI indicators, do not lead us to a conclusion that increased state capacity actually reduces disaster vulnerability.

From the regressions of cross-national data, it seems that the data supports my hypothesis – corruption contributes more to disaster vulnerability and not a lack of state capacity. With higher GDP and government effectiveness, we have higher damage and more deaths. Intuitively, it could be argued that, with better corruption control and effective government, what follows is fair distribution of wealth and overall a greater amount of wealth in the country. Hence, total damage tends to increase compared with countries which have low wealth tends to loos less from disaster strikes. However, the fact that with better corruption control and effective government tends to increase total death, is counter intuitive. With effective form of government and greater GDP, we can assume a country to have greater amount of

resources available to invest towards structural developments and other development projects, relieving its populations from the state of vulnerability, consequently reducing disaster vulnerability. But I found that except for political stability and absence of violence, no other WGI indicator show any statistically significant correlation with either of the dependent variables. This could potentially be a result of co-linearity of the WGI indicators, but from this we cannot sum up that better state capacity reduces disaster vulnerability. So, we cannot reject our hypothesis of corruption being the culprit. Since all the analyses are done in OLS, this could be the reason why some of the regression results have not been able to explain correlations successfully. More sophisticated regression models may produce better, intelligible results.

Chapter 5: Conclusion and policy recommendation

Disaster preparedness is the major element in the overall concept of disaster risk reduction. A high level of preparedness is key to reducing damage of life in the aftermath of natural hazards. In developing countries preparedness mechanism is affected by two major factors – firstly, the role of state capacity, and secondly, the role of corruption. In this thesis, I have tried to explore one aspect of disaster vulnerability - what affects more: corruption or state capacity? My study analyses the factors that contribute towards disaster vulnerability taking Bangladesh as a specific case and using cyclone Sidr to compare between Bangladesh and India. I have, finally, regressed cross-national data to explore role of corruption towards disaster vulnerability. Bangladesh has been a case of poor governance and corruption which brews inefficiency. Bureaucratic politics has made institutions less transparent eventually giving rise to major corruption and scams. Nepotism, and

clientalism have been two other factors which have eroded the economy from the core thus initiating practice of corruption in all possible sectors. Bangladesh being a disaster prone country must acknowledge and address this relationship between corruption and natural disaster at all levels of government to mitigate loss – number of deaths and financial loss.

In general I found that corruption and state capacity are the two factors which affect disaster preparedness and relief actions in multiple ways. The analysis shows that when it comes to the affected people, they tend to blame it on the relief distribution officials and their corruption. While quantitative analysis of data collected from the affected people yield statistically significant correlation between relief officials and corruption, we need to discount for the fact that there is a time gap of eight years between cyclone Sidr (2007) and when the data was being collected. This may lead to responders giving information that is not objective. Also, we need to be mindful of the fact that general psyche of the affected is to blame it on corrupt officials. For instance, not every household requires the same relief items, which may have been considered as biased treatment and signs of corruption.

From the regressions of cross-national data, I found that the data supports my hypothesis – corruption contributes more to disaster vulnerability and not lack of state capacity. With higher GDP and higher corruption control, we have higher financial damage and death. Similarly, with effective form of goverment, we have more damage. Intuitively, it could be argued that as there is fair distribution of wealth and overall a greater amount of wealth in the country, total damage tends to increase compared with countries which have low wealth tends to loos less from disaster strikes. The regressions, however, fail to explain the relation between GDP and total number of deaths. This discrepancy is resultant from the assumption that state

governance is benevolent and will look to strengthen local capacity through investing in infrastructural development. However, information only on GDP is not enough to explain why countries with higher GDP will not be investing in infrastructure. Also, this could potentially be a result of my simpler quantitative model. A more sophisticated statistical model could produce more intelligible results.

The study is based on a small sample of 200 respondents from Bangladesh, which may have affected my regression results. If this study could be done on a larger scale, the results may have been more defined and concrete. Getting data from district level in Bangladesh is a challenging job. Therefore, a more detailed and expanding fieldwork was necessary for better and correct analysis. As I wanted to see the effect of corruption in the disaster preparedness level, I was not very successful in finding district wise corruption data, which was also a major impediment for my study. There is huge scope for research in this area of disaster risk reduction because most of the work related to natural disaster has been done primarily on post disaster relief. The natural disaster preparedness is also a money saving concept as already shown by ECHO factsheet and United Nations.

Policy Recommendations for a better preparedness mechanism in Bangladesh:

As Bangladesh is a disaster prone country its development is closely linked with disaster risk reduction and management efforts. The Government of Bangladesh has a separate cell for disaster management and relief, called the Government's bureau of disaster management and relief, later upgraded into the Disaster Management and Relief Division (DMRD). There are numerous regional and district level committees which are also part of national disaster management plan. Though there has been significant improvement over the past decades as could be seen from the reduced number of lives lost in the aftermath of disasters, a

lot remains to be done. Based on results and realities, following are my recommendations:

- To reduce red-tapism, nepotism and bureaucratic disturbance, so that policies can be implemented readily and in an effective manner.
- To increase investment in the public sector and continually pursuing the development agenda.
- To successfully coordinate the different levels of institutions working in the disaster management field.
- To increase public awareness, government should incorporate disaster risk reduction training and education from the school level, which will be a practical way to ensure community awareness.
- To coordinate the public and private institutions in a way so that their working procedure do not conflict with each other, rather the joint effort should be a better for the vulnerable masses.
- To collaborate with other countries with similar disaster profile and exchange success stories and lessons learnt.

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Bibliography

"Asia: Most Vulnerable to Natural Disasters." 2015. Article. OWSA. Accessed June 15. http://southasia.oneworld.net/archive/globalheadlines/asia-most-vulnerable-to-natural-disasters.

Agnoletti, Mauro, and Simone NeriSerneri. 2014. The Basic Environmental History. Springer.

Alam, Edris, and Andrew E. Collins. 2010. "Cyclone Disaster Vulnerability and Response Experiences in Coastal Bangladesh." Disasters 34 (4): 931–54.doi:10.1111/j.1467-7717.2010.01176.x.

Alcántara-Ayala, Irasema. 2002. "Geomorphology, Natural Hazards, Vulnerability and Prevention of Natural Disasters in Developing Countries." Geomorphology, Geomorphology in the Public Eye: Political Issues, Education, and the Public, 47 (2–4): 107–24. doi:10.1016/S0169-555X(02)00083-1.

"Asia: Most Vulnerable to Natural Disasters — OWSA: OneWorld South Asia - Latest News on Sustainable Development, Features, Opinions, Interviews with NGO Leaders and Multimedia from India and South Asia." 2015. Accessed June 13. http://southasia.oneworld.net/archive/globalheadlines/asia-most-vulnerable-to-natural-disasters#.VXyAYPmqqkp.

Asquer, Raffaele. 2011. "The Deadly Effects of Corruption: A Cross-National Study of Natural Disasters, 1980-2010." https://www.academia.edu/845400/The_Deadly_Effects_of_Corruption_A_Cross-National_Study_of_Natural_Disasters_1980-2010.

"Bangladesh - Aftermath of a Cyclone." 2015. Libcom.org. Accessed June 15. http://libcom.org/news/bangladesh-aftermath-cyclone-04122007.

"Bangladesh Country Profile - Overview." 2015. BBC News. Accessed April 21. http://www.bbc.com/news/world-south-asia-12650940.

"Bangladesh - Human Development Index." 2015. Knoema. Accessed June 12. http://knoema.com/atlas/Bangladesh/Human-Development-Index?compareTo=IN&action=export&gadget=indicator-preview-host.

"Bangladesh Political Stability - Data, Chart | TheGlobalEconomy.com." 2015. Accessed June 13. http://www.theglobaleconomy.com/Bangladesh/wb_political_stability/.

"Bangledesh Disaster Knowledge Network." 2015. Accessed June 12. http://www.saarc-sadkn.org/countries/bangladesh/hazard_profile.aspx.

Cordis, Adriana, and Jeff Milyo. 2013. “Don’t Blame the Weather: Federal Natural Disaster Aid and Public Corruption | Mercatus,” November. https://economics.missouri.edu/working-papers/2013/WP1321_milyo.pdf.

Cohen, Charles, and Erik Werker. 2008. “The Political Economy of ``Natural’’ Disasters” 52 (6). http://jcr.sagepub.com/content/52/6/795.abstract.

“Cyclone Crosses Orissa without Damage, Veers-off West Bengal.” 2007. National Institute of Disaster Management. http://nidm.gov.in/PDF/DU/2007/November/16-11-07.pdf. p. 1

“Dhaka, Bangladesh Disaster Risk Management Profile.” 2006, July.

“Disaster Risk Reduction.” n.d. European Commission. http://ec.europa.eu/echo/files/aid/countries/factsheets/thematic/disaster_risk_reduction.pdf.

“EconPapers: Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention.” 2015. Accessed June 13. http://econpapers.repec.org/bookchap/wbkwbpubs/2512.htm.

“Database | EM-DAT.” 2015. Accessed June 15.

Escaleras, Monica, NejatAnbarci, and Charles Register. 2006. “Public Sector Corruption and Natural Disasters: A Potentially Deadly Interaction.” Working Paper 06005. Department of Economics, College of Business, Florida Atlantic University. https://ideas.repec.org/p/fal/wpaper/06005.html.

“Factsheet: Social Vulnerability to Disasters.” 2015. Accessed June 12. https://www.academia.edu/1606768/Factsheet_Social_Vulnerability_to_Disasters.

Ferris, Elizabeth. 2015. “Natural Disasters, Conflict, and Human Rights: Tracing the Connections.” The Brookings Institution. Accessed April 16. http://www.brookings.edu/research/speeches/2010/03/03-natural-disasters-ferris.

“Governance and Corruption.” 2015. Accessed June 15. http://www.ifad.org/operations/finance/governance.htm.

“Human Adjustment to Cyclone Hazards : A Case Study ... | Colorado State Publications Library Digital Repository.” 2015. Accessed June 13. http://cospl.coalliance.org/fedora/repository/co:14171.

“INDIA: CYCLONE SIDR.” 2007. International Federation of Red Cross. http://www.ifrc.org/docs/appeals/rpts07/INcy21110701.pdf.

“Infographic: East Asia Pacific – A Region At Risk.” 2015a. Accessed June 12. http://www.worldbank.org/en/news/feature/2013/06/03/infographic-east-asia-pacific-a-region-at-risk.

———. 2015b. Accessed June 12. http://www.worldbank.org/en/news/feature/2013/06/03/infographic-east-asia-pacific-a-region-at-risk.

“Insurance Report: Extreme Weather Already Costing Us Dearly - Al Jazeera English.” 2015. Accessed June 13. http://www.aljazeera.com/indepth/opinion/2012/11/201211291334845346.html

“International Conference on: Institutions, Culture and Corruption in Africa / CODESRIA.” 2015. Accessed June 13. http://www.codesria.org/spip.php?article354.

Kaufmann, Daniel, AartKraay, and Pablo Zoido-Lobaton. 1999. “Governance Matters.” Policy Research Working Paper Series 2196.The World Bank.https://ideas.repec.org/p/wbk/wbrwps/2196.html.

Kunwar, The author has posted comments on this articleDarshan, Yogesh Kumar, TNN | May 31, 2015, and 03 03am Ist. 2015. “Babus ‘Ate up’ Rs 100 Crore Aid for Uttarakhand Flood Victims.” The Times of India. Accessed June 12. http://timesofindia.indiatimes.com/india/Babus-ate-up-Rs-100-crore-aid-for-Uttarakhand-flood-victims/articleshow/47486246.cms.

“Linking Disaster Risk Reduction and Poverty Reduction.” 2008. A Publication of the Global Network of NGOs for Disaster Risk Reduction. http://www.unisdr.org/eng/about_isdr/isdr-publications/14_Linking_Disaster_Risk_Reduction_Poverty_Reduction/Linking_Disaster_Risk_Reduction_Poverty_Reduction.pdf.

“LockerDome - Personalize the Web.” 2015. LockerDome. Accessed June 13. https://lockerdome.com/lad/7608285289399399.

Mahmud, Tanvir, and Martin Prowse. 2012a. “Corruption in Cyclone Preparedness and Relief Efforts in Coastal Bangladesh: Lessons for Climate Adaptation?” Global Environmental Change 22 (4): 933–43.
———. 2012b. “Corruption in Cyclone Preparedness and Relief Efforts in Coastal Bangladesh: Lessons for Climate Adaptation?” Global Environmental Change 22 (4): 933–43.doi:10.1016/j.gloenvcha.2012.07.003.

Marshall, Monty G. PhD. 2013. “POLITY IV PROJECT: Dataset Users’ Manual.” Center for Systemic Peace and Societal-Systems Research Inc. http://www.systemicpeace.org/inscr/p4manualv2012.pdf.

Miyan, M Alimullah.n.d. “CYCLONE DISASTER MITIGATION IN BANGLADESH.” South Asian Disaster Management Center (SADMC) IUBAT—International University of Business Agriculture and Technology Dhaka, Bangladesh. http://www.fao.org/forestry/11285-03611be0ad43d80eefb3de4a8ee2e1fd0.pdf.

“Natural Disasters & Assessing Hazards and Risk.” 2015. Accessed June 12. http://www.tulane.edu/~sanelson/Natural_Disasters/introduction.htm.

"Natural Disaster Risk Index." 2015. Accessed June 15. http://www.wrsc.org/attach_image/natural-disaster-risk-index.

"Natural Hazards | WMO." 2015. Accessed June 12. https://www.wmo.int/pages/themes/hazards/index_en.html.

"Politics of Corruption in Bangladesh." 2012a. December 4. http://www.vifindia.org/article/2012/december/04/politics-of-corruption-in-bangladesh.

———. 2012b. December 4. http://www.vifindia.org/article/2012/december/04/politics-of-corruption-in-bangladesh.

Seppo, Tiihonen. n.d. FROM GOVERNING TO GOVERNANCE: A Process of Change. University of Tampere.

———. n.d. FROM GOVERNING TO GOVERNANCE: A Process of Change. University of Tampere.

"SIMULATION OF PHYSICAL AND SOCIO-ECONOMIC FACTORS OF HUMAN VULNERABILITY TO CYCLONE AND STORM SURGE." 2015. Accessed June 12. https://www.academia.edu/10032036/SIMULATION_OF_PHYSICAL_AND_SOCIO-ECONOMIC_FACTORS_OF_HUMAN_VULNERABILITY_TO_CYCLONE_AND_STORM_SURGE.

Sivakumar, M. V. K. 2006. "Natural Disasters and Their Mitigation for Sustainable Agricultural Development." In Management of Natural and Environmental Resources for Sustainable Agricultural Development, Proceedings of a Workshop Held from February 13e16, 172e191. http://www.wamis.org/agm/pubs/agm10/agm10_15.pdf.

"State Disaster Management Policy." n.d. Government of Rajasthan Disaster Management & Relief Department Food Building, Ground Floor, Government Secretariat, Jaipur-302005. http://www.dmrelief.rajasthan.gov.in/documents/dm-policy-eng.pdf.

"Super Cyclone Sidr 2007: Impacts and Strategies for Interventions." 2008. Ministry of Food and Disaster Management Bangladesh Secretariat, Dhaka, Bangladesh. http://www.preventionweb.net/files/9470_cyclonebangladesh.pdf.

Sutton, Jeannette, and Kathleen Tierney. 2006. "Disaster Preparedness: Concepts, Guidance, and Research." Natural Hazards Center Institute of Behavioral Science University of Colorado Boulder, CO http://www.colorado.edu/hazards. http://www.fritzinstitute.org/pdfs/whitepaper/disasterpreparedness-concepts.pdf.

"Tackling Corruption in Disaster Relief Efforts." 2015. Accessed June 13. http://www.trust.org/item/20131208224327-ykbwh/.

"The Waning of the Communist State." 2015. Accessed June 13. http://publishing.cdlib.org/ucpressebooks/view?docId=ft5g50071k&chunk.id=d0e3467&toc.depth=1&toc.id=d0e3467&brand=ucpress.

Thura, Nadia. 2013. "Natural Disasters, Political Corruption, and a Culture of Resilience in the Philippines." December 18. http://berkleycenter.georgetown.edu/letters/natural-disasters-political-corruption-and-a-culture-of-resilience-in-the-philippines.

Tobin, Graham A. 1997. Natural Hazards: Explanation and Integration. Guilford Press.

Walder, Andrew. G. 1995. The Waning of the Communist State.University of California Press. http://publishing.cdlib.org/ucpressebooks/view?docId=ft5g50071k&chunk.id=d0e3467&toc.depth=1&toc.id=d0e3467&brand=ucpress.

"What Is Disaster Risk Reduction? - UNISDR." 2015. Accessed June 12. http://www.unisdr.org/who-we-are/what-is-drr.

White, Gilbert, Robert Kates, and Ian Burton. 2001. "Knowing Better and Losing Even More: The Use Ofknowledge in Hazards Management." Pergamon, Environmental hazards, 3: 81–92.

"Working Together for Disaster Preparedness | Dhaka Tribune." 2015. Accessed March 17. http://www.dhakatribune.com/long-form/2014/mar/27/working-together-disaster-preparedness.

"World Risk Report 2013." 2013. UNU-EHS, universitatbonn. http://worldriskreport.entwicklung-hilft.de/uploads/media/WorldRiskReport_2013_online_01.pdf.

"Worldwide Governance Indicators, 2014 - Knoema.com." 2015. Knoema. Accessed June 11. http://knoema.com/WBWGI2014/worldwide-governance-indicators-2014?country=1000160-bangladesh.

Zafarullah, Habib, and RedwanurRahman. 2008. "The Impaired State: Assessing State Capacity and Governance in Bangladesh: International Journal of Public Sector Management: Vol 21, No 7" 21 (7): 739–52.

Appendix I – Questionnaires

Questionnaire (Affected people)

Basic information about the respondent1. Age: …… yers 2. Religion: 1. Muslim 2 Hindu 3 Christian 4 Buddhist 5 Other

3. Gender: 1 Male 2 Female 3 Other 4. Address: …… district

5. Level of education: 1 No education 2 Primary 3Secondary4 University

6. Occupation: primary - …… (in appropriate case) secondary - ……

7. Number of members in household: …… persons

8. Age range of family members:

(1) 1 – 5 years …… persons (2) 6 – 18 years …… persons (3) 19 years and above …… persons

9. Income generating family members: …… persons

10. Monthly household income: …… taka

Disaster related information

1. What type of natural disasters have you experienced? -
   1. Flood 2. Cyclone 3. River erosion 4.Earthquake 5.Drought 6. Tsunami 7. Land slide

2. What type of natural disasters have you been affected from? -
   1. Flood 2. Cyclone 3. River erosion 4.Earthquake 5.Drought 6. Tsunami 7. Land slide

3. Were you affected by Cyclone Sidr in 2007? - 1. Yes 2. No

if 'yes', level of affectedness within the household -

3.1 Death …… persons 3.2 Injured …… persons

3.3 House 1. Not affected 2. Affected 3. Completely destroyed

3.4 Arable land 1. Not affected 2. Affected 3. Completely destroyed

3.5 Cattle 1. Not affected 2. Affected 3. Completely destroyed

4. Did you receive any early warning about the cyclone? - 1. Yes 2. No

5.1 if 'yes' then, how early did you receive the warning? …… hours before the cyclone

5. How did you receive the early warning? – 1. TV 2. Radio 3. Mobile phone
   4. Red Crescent volunteer 5. Other (please specify) ……

6. Are you aware of any disaster response plan about your community from the local Red Crescent Unit? - 1. Yes 2. No

6.1 if 'yes', What does preparing entail in the preparedness plan? - (1) Hazard mapping (2) Locating the most vulnerable (3) Resource mobilisation (4) Coordination plan (5) Early warning dissemination (6). Public awareness campaign (7) Cyclone shelter maintenance and mgmt.(8) Mobilising your family (9) Special plan for women, children and PWD (10) Storage of emergency food and potable water (11) Securing tube wells

7. Did you receive any preliminary assistance with relocation to the cyclone shelter? 1. Yes 2. No

7.1 If 'yes' what? ……

8. Is there a cyclone shelter in your locality? - 1. Yes 2. No

9. Were you able to relocate your family to the shelter? - 1. Yes 2. No

9.1 If 'no' why not: 1. Insufficient space 2. Religious segregation 3.Ethnic minority

10. Did you receive any relief after cyclone Sidr hit your community? - 1. Yes 2. No

10.1 If 'yes' what did you receive? – 1. Rice 2. Lentil 3. Potato 4. Salt 5. Molasses 6. Milk 7. Biscuit 8. Clothes 9. Blanket 10. Match 11.Oil 12.Cooking utensils 13. House reconstruction materials (Tin-sheet) 14. Other/s (please specify) - ……

11. Are you aware of any cash distributed as relief?-1. Yes 2. No

11.1 if 'yes', how much? - …… taka per household

12. Did you receive all the relief items like others? - 1. Yes 2. No

12.1 If 'no':i. which items did you receive less than others? - 1. Food items 2. Cooking utensils 3. Blanket 4. House reconstruction materials (Tin-sheet) 5. Other/s (please specify) -

……

12.2 If no, ii. whynot: 1. Nepotism among distributors 2. Relief distributors asked for bribe 3. Relevant officials' embezzlement 4. Religious segregation 5.Other reasons (please specify) -

……

……

13. How was the treatment of the local Red Crescent volunteers/officials in the emergency period?
   1. Very poor 2. Poor 3. Fair 4. Good 5. Very good

14. How would you suggest the affected people in your community be served better?

……
……

Questionnaire (RCY)

Basic information about the respondent

1. Age: …… years 2. Religion: ☐Muslim ☐Hindu ☐Christian ☐Buddhist ☐Other
3. Gender: ☐Male ☐ Female ☐ Other 4. Address: …… district
5. Level of education: ☐No education ☐Primary ☐Secondary ☐University
6. Occupation: ☐Student ☐Other:
……
7. How long have you been involved with RC/RC movement? - …….years
8. How did you know about the RC/RC movement? – ☐From friends ☐From school RCY unit

Disaster related information

1. What type of natural disasters takes place in your district? -
☐Flood ☐Cyclone ☐River erosion ☐Earthquake ☐Drought ☐Tsunami ☐Land slide

2. What type of natural disasters have you responded to/volunteered in? -
☐Flood ☐Cyclone ☐River erosion ☐Earthquake ☐Drought ☐Tsunami ☐Land slide

3. Was your district affected by Cyclone Sidr in 2007? - ☐Yes ☐No

4. Are you aware of any disaster response plan about your district from the local Red Crescent Unit? - ☐Yes ☐No
if 'yes', what does preparing entail in the preparedness plan? -
☐Hazard mapping ☐Locating the most vulnerable ☐Resource mobilisation☐Coordination plan ☐Early warning dissemination ☐Public awareness campaign ☐Cyclone shelter maintenance and mgmt. ☐Mobilisingvulnerable families
☐Special evacuation plan for women, children &PWD ☐Storage of emergency food and potable water ☐Securing tube wells
☐Other/s (please specify):
……

5. Was there any early warning disseminated aboutCycloneSidr from Red Crescent Unit? - ☐Yes ☐No
if 'yes' then, how early was the warning disseminated? …… hours before the cyclone

6. How was the early warning disseminated by Red Crescent Unit? – ☐TV ☐Radio ☐Mobile phone ☐Red Crescent volunteer ☐Other/s (please specify):
……

7. Are you aware about any other organisation distributing early warning? -☐Yes ☐No
if 'yes', name of organisation/s: i. …… ii.
…….
iii. …… iv.
……

8. Did you take part in any relief distribution activity in the aftermath ofcycloneSidr? - ☐Yes ☐No
if 'yes' then, were you satisfied with the relief distribution? –
☐Completely satisfied ☐Partially satisfied ☐Somewhat dissatisfied ☐Completely dissatisfied
if not 'completely satisfied' then, what went wrong? – ☐Nepotism☐Embezzlement of relief goods☐Corruption by officials☐Corruption by RC Unit Management
☐Other/s (please specify):
……
9. Are you aware of any cash being distributed as relief in the aftermath of Sidr? - ☐Yes ☐No
if 'yes', how much? - …… taka
10. Did everyone receive all the same relief supplies? - ☐Yes ☐No
if 'no', why not? – ☐Nepotism among distributors ☐Relief distributors asked for bribe ☐Relevant officials' embezzlement ☐Other reasons (please specify) -
……

11. Is there a cyclone shelter in your locality? - ☐Yes ☐No

12. Are you aware of any cyclone shelter management plan in your RC Unit? - ☐Yes ☐No

13. Were you involved in theevacuation/relocationof vulnerable people to the shelter? - ☐Yes ☐No

14. Did all vulnerable people seeking shelter get it? - ☐Yes ☐No
if ‘no’ why not: ☐Insufficient space ☐Religious segregation ☐Ethnic minority ☐ Asked for bribe ☐
Other:……..

15. Are youaware of any mal treatment of the local Red Crescent volunteers/officials in the emergency period? - ☐ Yes ☐No

16. How would you suggest the affected people in your community be served better?
……
……