THE LINKS BETWEEN DISASTERS, RELIEF, REHABILITATION AND DEVELOPMENT

by

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ABSTRACT

This capstone discusses the relations between disasters, disaster relief and rehabilitation, and development. Natural disasters frequency and severity has increased over the last few decades with greater impacts on developing countries further impeding achievement of the Millennium Development Goals (MDGs). This capstone uses the Bangladesh floods, 2004 and the Asian tsunami in Sri Lanka, 2004 as case studies to assess the disaster response and development efforts undertaken in promoting development. Three main recommendations are given; (1) Build capacity to implement and maintain disaster reduction systems (2) Include elements of disaster reduction in developments efforts (3) Include elements of development in disaster response efforts. Potential challenges for achieving these recommendations are also described.

Keywords: Natural disasters; Development; Developing countries ; Millennium Development Goals (MDGs); Risk reduction; Relief; Rehabilitation

To SIR(L) -

This initially simply read...

For always teaching me to live and to love

YOU are the Best of the Best

Now I add...

For a moment we forgot everything else that was not going right and rejoiced,

I hope this capstone will always bring you moments of joy.

ACKNOWLEDGEMENTS

Let me start by thanking the residents of Barmer for their inspiration in the formulation and writing of this capstone. I hope this capstone will also bring inspiration to your lives and your community.

I would like to thank my mum and dad for awarding me opportunities to bring myself to this place. I know that these opportunities were the result of numerous sacrifices on their part, I will be forever grateful. Thanks to my brother, who always knows how to make me laugh and get me through everything. I am grateful to my entire family for always being there for me, from spelling homework to the writing of this capstone. Your encouragement and support has carried me through many sleepless nights.

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GLOSSARY

ADB	Asian Development Bank
ADRC	Asian Disaster Reduction Centre
AIDS	Acquired Immune Deficiency Syndrome
BBC	British Broadcasting Corporation
BOP	Balance of Payments
Capacity	The ability to hold, receive or absorb
CBO	Community Based Organization
CCF	Christian Children's Fund (now ChildFund)
CE-DAT	Complex Emergency Database (part of CRED)
CHAP	Common Humanitarian Action Plan (formulated by OCHA)
CNO	Centre for National Operations (Sri Lanka)
CRED	Centre for Research on the Epidemiology of Disasters
DER	Disaster & Emergency Response (Sub-group for LCG Bangladesh)
DFID	United Kingdom's Department for International Development

Disaster	A natural or man-made event that disrupts normal community function due to losses that exceed the ability of the affected community to manage
DRR	Disaster Risk Reduction
EM-DAT	Emergency Disasters Database (part of CRED)
FAO	Food Aid Organization
GDP	Gross Domestic Product
HAF	Hyogo Action Framework
Hazard	A threatening event, or probability of occurrence of a potentially damaging phenomenon within a given time period and area
HIV	Human Immunodeficiency Virus
IASC	Inter-Agency Standing Committee
IDRL	International Disaster Response Laws, Rules and Principles
IFRC	International Federation of the Red Cross and Red Crescent Societies
ICG/IOTWS	Intergovernmental Coordination Group for the Indian Ocean Tsunami Early Warning and Mitigation Systems
IPCC	Intergovernmental Panel on Climate Change
JMA	Japan Meteorological Agency
LCG	Local Consultative Group (Bangladesh group composed of the Secretary, Economic Relations Division, Ministry of Finance, Government of Bangladesh and 39 Bangladesh-based representatives of bilateral donors, International Monetary Fund, World Bank, ADB and the UN agencies.)

LTTE	Liberation Tigers of Tamil Eelam (Sri Lanka)
MDG	Millennium Development Goal
MSF	Médecins Sans Frontières
Natural disaster	Disruptions caused by forces of nature that overwhelm local capacity
NCDM	National Council for Disaster Management (Sri Lanka)
NGO	Non-governmental organization
OECD	Organization for Economic Co-operation and Development
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PAHO	Pan-American Health Organization
PPP	Purchasing Power Parity
Preparedness	Measures taken to prepare for and reduce the effects of disasters
PTWS	Pacific Tsunami Warning Centre
SCHR	Steering Committee for Humanitarian Response
SLILG	Sri Lanka Institute for Local Governance
TAFREN	Task Force for Rebuilding the Nation (Sri Lanka)
TEC	Tsunami Evaluation Committee
UN	United Nations

UN-HABITAT	United Nations Human Settlements Programme
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDAC	United Nations Disaster Assessment and Coordination
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UNMC	United Nations Millennium Challenge
VGF	Vulnerable Feeding Group (Bangladesh)
Vulnerability	Diminished capacity of an individual or group to anticipate, cope with, resist and/or recover from the impact of a natural or man-made hazard
WFP	World Food Programme
WHO	World Health Organization

PREFACE

The Barmer district of Rajasthan, India experienced devastating floods in 2006. The district is located in the Great Indian Desert so floods were unexpected and the district was ill prepared for such a disaster. The floods killed over 300 people and left entire villages devastated and thousands homeless. The floods hit the region during the night and by morning when help started coming in hundreds had already died.

Almost four years later, Barmer is still recovering. There are still numerous reminders of the disaster, but not all have been bad. According to discussions with a few local non-governmental organizations (NGOs), government officials and local villagers, there have been some opportunities created since the disaster. Temporary housing for affected communities in relief camps provided an opportunity for mass immunization and dissemination of health education. The rehabilitation process provided a chance to rebuild more durable infrastructure such as stronger stone houses with better sanitation facilities and hospitals that are more accessible with improved capacity. The floods in themselves made the soil more fertile for the cultivation of cash crops such as cumin and castor seed, which has created livelihood opportunities for some local residents. The most notable positive change, however, was the creation of the disaster preparedness and mitigation plans for the district, which has contributed towards reducing

disaster vulnerability of affected communities by relocating people away from flood lines and creating disaster response plans. Thus, Barmer provided the inspiration for a better understanding of how relief and rehabilitation efforts can be used to improve development in the midst of a disaster and create positive long-term impacts. A discussion at state level would be more appropriate because development is more commonly measured at state level rather than at district level.

INTRODUCTION

Capstone Overview

This capstone will discuss how disaster response and recovery can be integrated with development for a more sustainable future. Disasters aggravate the factors that negatively affect the health of the population. Disaster response efforts that focus solely on removing or changing only those factors brought about by the disaster do not actually *improve* the health of the community. Instead, these efforts have the propensity to reinstate prior vulnerabilities. This capstone addresses social determinants of health that are commonly disrupted by natural disasters and are usually considered during response and rehabilitation. These determinants include education, livelihood and poverty, food security, water and sanitation, shelter, primary health care services and the physical environment. The capstone describes the links between disasters and development and the implications of these links on disaster response and development. Greater emphasis is placed on achieving the Millennium Development Goals (MDGs), as the measure for development.

The Bangladeshi floods of 2004 and Asian Tsunami that affected Sri Lanka in 2004 will be used as case studies to assess how the efforts of different disaster response and development organizations improved the lives of those affected. These discussions will focus more on the efforts of larger humanitarian

and international organizations because their size, scope and capacity provide them the ability to significantly influence both disaster response and development. These larger organizations include the World Bank, World Health Organization (WHO), United Nations (UN) agencies, Asian Development Bank (ADB) and the International Federation of Red Cross and Red Crescent Societies (IFRC), and represent organizations that are usually involved in many places allowing for comparability across different geographic areas. These organizations are established which allows for an evaluation of efforts over a longer time span. There is also a greater scope of accessible and relevant information on learned lessons and best practices from these larger organizations as compared to local NGOs and agencies. The intention of focusing the discussion on large organizations is not to restrict the analysis to the frame of a top-down approach to disaster response and development but rather address some of the structural upstream factors that have greater influence. Similar analyses at the local level that focus on local agencies in disaster response and development would be equally beneficial. Despite the selected case studies in this capstone being developing countries, the recommendations given at its conclusion can be adaptable to developed countries. Development can be considered as a continuum and so countries occupying different positions on this continuum should consider their local context before applying the recommendations set out in this capstone. Development levels also vary within the same country so the integration between disaster response and development can still be applicable in developed countries.

This capstone only discusses responses to hydrological and meteorological natural disasters and cautions the applicability of the recommendations to technological disasters, complex emergencies or climatological and biological disasters. Responses to geophysical disasters may follow similar patterns to those in acute meteorological disasters and therefore may be applied to similar concepts as discussed in this paper. The main recommendation is for the integration of disaster response efforts with development activities in planning, implementation and evaluation.

Description of Disasters

A disaster is defined as a “natural or man-made event that disrupts normal community function due to losses that exceed the ability of the affected community to manage” (Clements, 2009; IFRC, n.d.a); and in turn requires external assistance (Hooke & Rogers, 2005). The impact of disasters on human beings is dependent on the combination of exposure to a dangerous phenomenon (hazard), size of the population exposed, level of vulnerability, resilience of the population, preparedness and the availability of resources to cope (de Ville de Goyet, 2008; Clements, 2009; UNISDR, 2009). Earthquakes, hurricanes or floods are hazards that *only* translate into disasters when they occur in a vulnerable area with inadequate resources (de Ville de Goyet, 2008; Noji, 1997). The equation below describes a disaster (IFRC, n.d.a):

$$\text{Disaster} = \text{Vulnerability} + \text{Hazard/Capacity}$$

Natural disasters are defined as disruptions caused by forces of nature "that overwhelm local capacity" (Noji, 1997; Spiegel et al, 2007). The Centre for Research on the Epidemiology of Disasters (CRED) recognizes five different types of natural disasters; geophysical e.g. earthquakes, meteorological e.g. storms, hydrological e.g. floods, climatological e.g. drought and biological e.g. epidemic on its Emergency Events Database (EM-DAT) (EM-DAT, n.d.a). Other categories of disasters are man-made disasters which include technological disasters such as bioterrorism and complex emergencies such as conflict (McEntire, 2007; EM-DAT, n.d.a). EM-DAT only records disasters that meet at least one of the following criteria:

"• Ten (10) or more people reported killed.

• Hundred (100) or more people reported affected.

• Declaration of a state of emergency.

• Call for international assistance."

There is some debate on the distinction between natural vs. man-made disasters as the definition of a disaster itself relies upon human actions of vulnerability and capacity (de Ville de Goyet, 2008; Lizarralde, Johnson & Davidson, 2010; Noji, 1997).The distinction between the two types of disasters is also difficult because a natural disaster may trigger secondary 'man-made' disasters such as fires after an earthquake (Noji, 1997). Natural disasters can be acute such as floods or chronic such as droughts (Noji, 1997; Spiegel et al, 2007)

For the purpose of this capstone natural disasters are defined as those caused by exposure to a hazard in nature. For ease of comparison, the focus will be on meteorological and hydrological disasters.

Disaster Statistics & Impacts

CRED is a WHO Collaborating Centre in Louvain, Belgium that “promotes research, training and technical expertise on humanitarian emergencies, with a special focus on public health and epidemiology” (CRED, n.d.). It generates and maintains the international disaster database, EM-DAT and a complex emergency database, CE-DAT (CRED, n.d.). CRED provides data to numerous partners that include UN agencies, multilateral/government agencies, NGOs and research institutions. EM-DAT estimates show that over 4,400 natural disasters occurred around the world between January 2000 and December 2009 (EM-DAT, n.d.b). The number of natural disasters has been on the rise since the 1970s, with more than 500 natural disasters reported in 2000 and 2002 (Fig. 1). Many other disasters go unreported or undocumented leaving considerable uncertainty in the number and rate of change over time (IFRC, n.d.b; 2006; Wisner, Blaikie, Cannon & Davis, 2004).

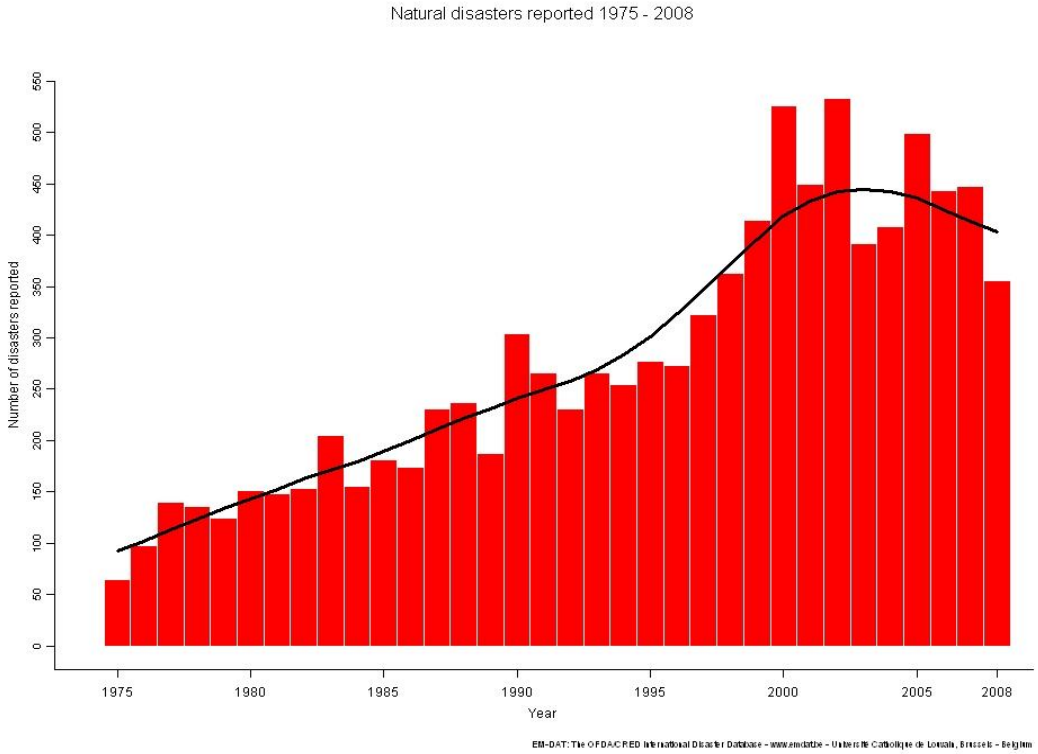

Figure 1: Graph of number of natural disasters reported between 1975 and 2008. From EM-DAT database

Natural disasters related to weather have significantly driven the rise in disaster statistics (IFRC, 2007; IPCC, 2007). Fifty-five million disaster victims were affected by weather-related disasters in 2009, which was three-quarters of those affected in total (UNISDR, 2009a). More than 30% of the weather-related natural disasters occur in the Asia & Pacific regions of the world (IFRC, 2007; 2008). Though the number of people killed in natural disasters has reduced from about 2 million in the 1970s to less than 800,000 in the 1990s, CRED statistics showed an increase in the number of people affected by natural disasters (Fig. 2); which rose from about 700 million to nearly 2 billion over two decades (EM-DAT, n.d.). Natural disasters cost countries billions of dollars, with global

damages of over US$200 billion in 2005. Most of 2005 damages were as a result of Hurricane Katrina. The least costly damages of the decade totalled US$20 billion in 2001(Fig. 3) (EM-DAT, n.d.).

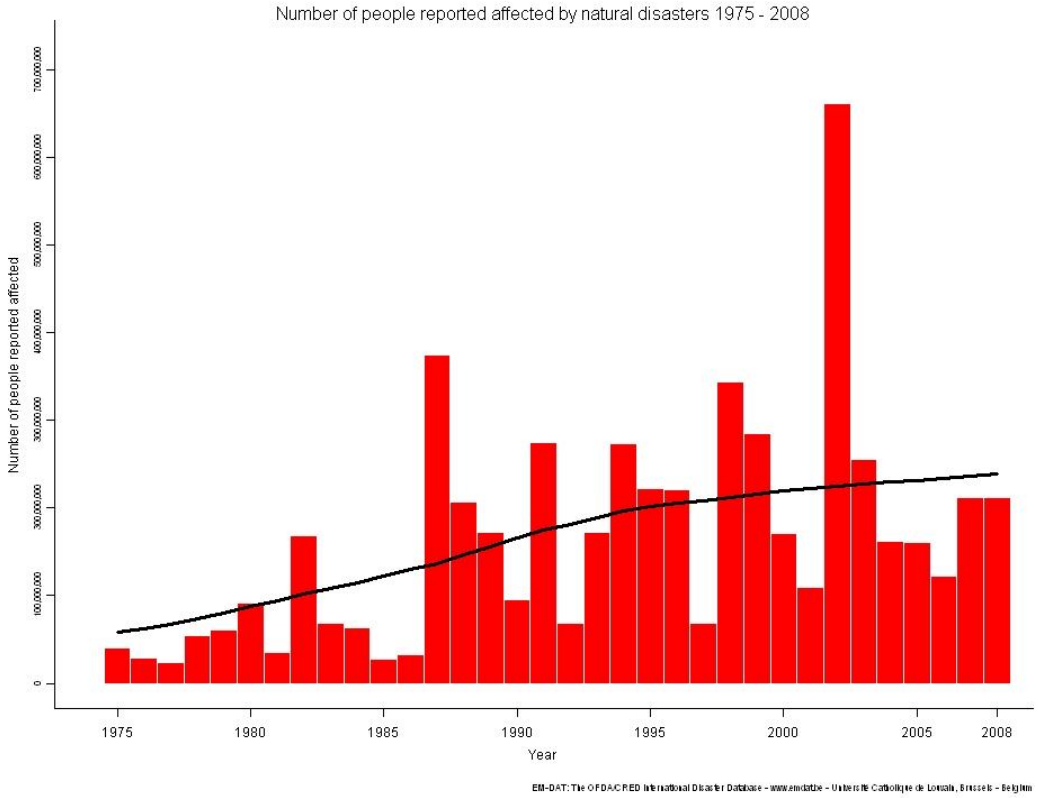

Figure 2: Graph of number of people affected by natural disaster from 1975 to 2008. From EM-DAT database.

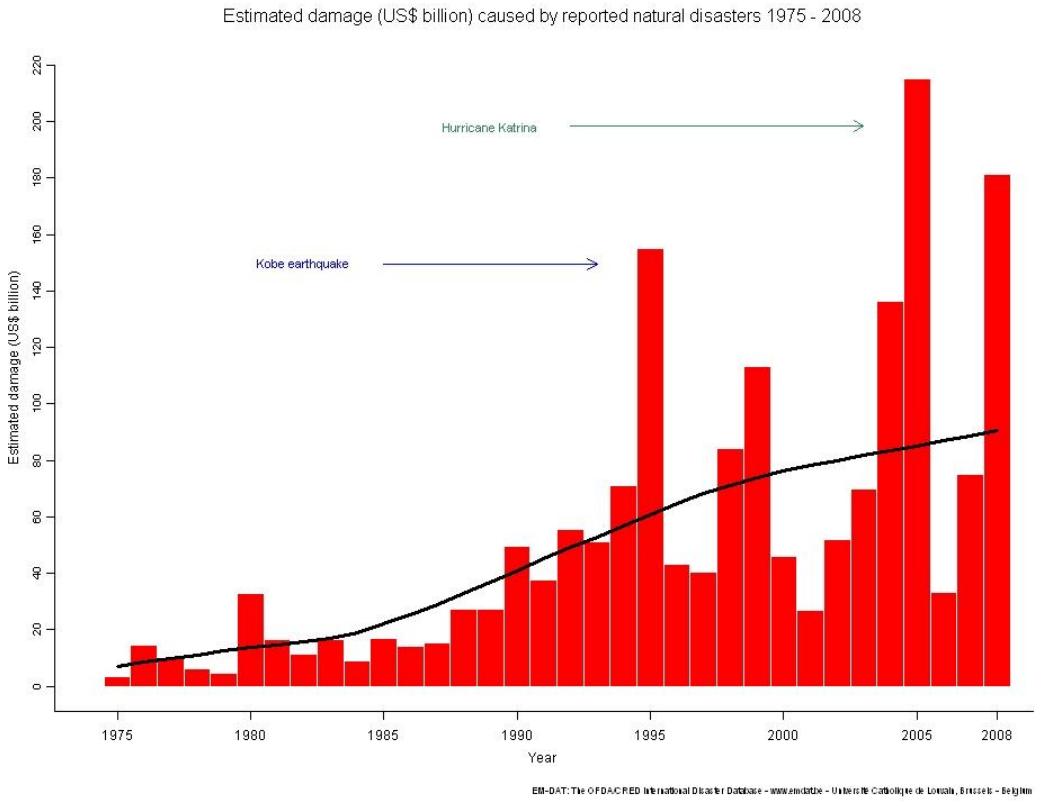

Figure 3: Graph of Estimated damages due to natural disasters from 1975 to 2008. From EM-DAT database.

Disasters have health, social, economic, psychological and physical impacts. Public health impacts of disasters include increased mortality and morbidity that can overwhelm local health capacity (Noji, 1997). Disasters can also destroy health infrastructure and disrupt routine health services and preventative care activities, these in turn can contribute to higher mortality and morbidity in the long-term (Noji, 1997). Disasters have psychosocial effects on affected communities, increasing cases of mental health problems in the community (Cook, A., Watson, J., Buynder, P., Robertson, A., & Weinstein, P.,

2008; McEntire, 2007; Noji. 1997; Berg et al., 2008). Disasters can sometimes result in food shortages that may translate into starvation or micronutrient deficiency diseases (Few & Matthies, 2006; Noji, 1997). Disasters displace large populations of people, which may result in overcrowding in other areas. This displacement and overcrowding increases the probability of disease outbreaks in host areas, stemming from deficiencies in the resources required to cope with the influx of displaced people (Noji, 1997; PAHO, 2000).

Not all public health impacts of a disaster are immediately evident. Disasters can also affect social determinants of health such as livelihoods, school enrollment, school attendance and access to resources (Berg et al., 2008; World Bank, n.d.). Disasters can affect economic growth positively, negatively or not at all; however, severe disasters do not have any positive effects on economic growth (Loayza, Olaberria, Rigolini & Christiaensen, 2009). On a large scale, the long-term effects of a disaster can occur in various ways (Few & Matthies, 2006). A disaster may destroy economic infrastructure and diminish local budgets for several years (Noji, 1997; PAHO, n.d.). Disasters can also alter land fertility and affect harvests for years or even require a complete change in type of crops cultivable (Few & Matthies, 2006). At an individual level, the death of the breadwinner for a family may leave them in a state of poverty or destitution for years or even generations (Few & Matthies, 2006; Dilley et al. 2005).

Disaster Management

Disaster management has been described as a cyclic process that Clements and McEntire describe as comprising of four main stages (Figure 4) – mitigation, preparedness, response and recovery (Clements, 2009; McEntire 2007). Alternatively, Noji describes five phases of a disaster cycle for sudden-impact disasters (Figure 5): inter-disaster, pre-disaster, impact, emergency, and reconstruction (Noji, 1997).

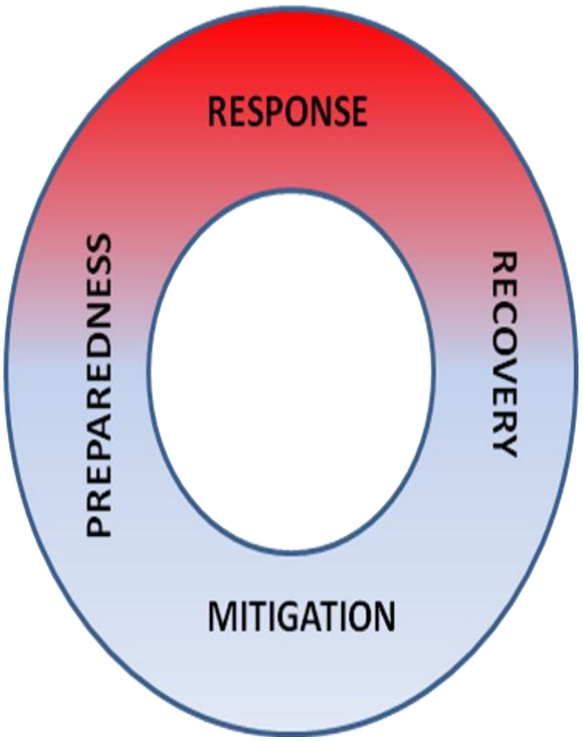

Figure 4: Disaster Management Cycle

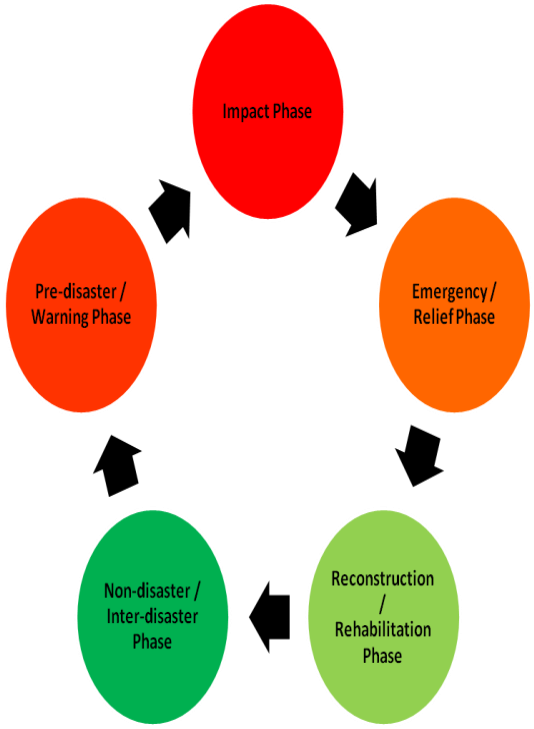

Figure 5: Noji's Disaster Cycle

The **mitigation phase** includes all measures taken to anticipate and reduce the impacts of potential hazards such as early warning systems or differential building codes in hurricane prone areas (Clements, 2009; McEntire 2007). The **preparedness phase** comprises the efforts done in preparation of a potential hazard to ensure a more effective response and recovery (Clements, 2009; McEntire 2007). This phase coincides with the inter-disaster phase of Noji's disaster cycle (Noji, 1997) and includes creating emergency plans that will be followed in the event of a disaster occurring (Clements, 2009; McEntire 2007; Noji, 1997).The **response phase** includes all the actions taken in response to a current or imminent disaster event (Clements, 2009; McEntire 2007) and is also referred to as the relief or emergency phase; characterized by immediate efforts to save lives. The **recovery or rehabilitation phase** includes all actions taken in order to return the affected area to normal (Clements, 2009; McEntire 2007). Mitigation and preparedness phases are mostly under the jurisdiction of the local government and community (McEntire, 2007). According to the definition of a disaster – to overwhelm local capacity – response and recovery stages are the responsibility of *both* the local and external players (McEntire, 2007; PAHO, 2000). The different phases may last from just a few seconds [impact phase of an earthquake], to a number of years [rehabilitation phase after a tsunami]. The duration of each phase depends on the type and extent of the disaster, the resources available and the vulnerability of the community; with one phase merging into the next (Clements, 2009). This capstone will focus on how efforts during the response and recovery stages influence future health outcomes. The

argument for better mitigation and preparedness has been lamented in numerous literature resulting in the creation of organizations such as United Nations International Strategy for Disaster Reduction (UNISDR), the ProVention Consortium, Asian Disaster Reduction Center (ADRC) and numerous conferences on disaster risk reduction (DRR) and disaster reduction (UNDP, 2004; UNISDR, 2007; World Bank, n.d.).

Key Players in Disaster Management

There are numerous players in disaster relief and rehabilitation. Important players include local governments and agencies, local businesses, international governments and their respective agencies, UN agencies and international humanitarian organizations (McEntire, 2007). Local governments are mainly responsible for implementing and coordinating disaster response efforts, while all other players provide assistance as requested (PAHO, 2000). Some of the largest humanitarian organizations involved in disaster relief include, The International Federation of Red Cross and Red Crescent Societies (IFRC), Caritas Internationalis, Catholic Relief Services, International Save the Children Alliance, Lutheran World Federation, Oxfam and Médecins Sans Frontières (MSF). Local residents (outside any particular agency) of affected areas also play a great role in disaster relief. Soon after impact, local residents are naturally the first people on the scene and offer initial help such as search and rescue. They are also the last ones remaining, as they continue to rebuild their community (PAHO, n.d.; 2000). The involvement of each player depends on the type and

extent of the disaster. An earthquake may call for more orthopaedic surgeons than after a flood; and a low magnitude earthquake in a remote area may require assistance only from the local government and other local agencies with very little or no international involvement (PAHO, 2000).

The UN Office for the Coordination of Humanitarian Affairs (OCHA) is one of the international bodies responsible for mobilizing and coordinating international humanitarian assistance during disasters (OCHA, n.d.). The UN Disaster Assessment and Coordination team is deployed at the request of international assistance by the disaster-stricken country to identify overall humanitarian needs (OCHA, n.d.a). OCHA then develops a plan of action (Common Humanitarian Action Plan, CHAP) that is disaster specific, comprehensive and avoids duplication (OCHA, n.d.b). OCHA is also responsible for evaluating those efforts after the disaster has passed (OCHA, n.d.). OCHA works alongside the Inter-Agency Standing Committee (IASC); an "inter-agency forum for coordination, policy development and decision-making that involves key UN and non-UN humanitarian partners" (IASC, n.d.).

Guidelines for Disaster Management

Different ideals and criteria govern humanitarian organizations' efforts. However, there are a few guidelines that are widely accepted: Steering Committee for Humanitarian Response (SCHR) Code of Conduct, Sphere guidelines and the Hyogo Action Framework (HAF).

Care International, Caritas Internationalis, the International Committee of the Red Cross, the International Federation of Red Cross and Red Crescent Societies, International Save the Children Alliance, Lutheran World Federation, Oxfam, World Council of Churches, and World Vision International make up the SCHR that is responsible for the self-policing and voluntary Code of Conduct used to guide NGOs when undertaking humanitarian efforts (IFRC, n.d.c.). As of September 2009, there were 481 signatories from various countries, indicating their commitment to adhere to the principles outlined in the SCHR Code of Conduct. In acknowledgment of other players in disaster response and recovery, the Committee also created recommended Codes of Conduct for the governments of disaster-affected countries, donor governments and intergovernmental organizations (IFRC, n.d.c). Appendix 1 lists the main components of the Code of Conduct.

The Sphere Project contains a set of guidelines aimed at steering humanitarian efforts during disasters. This project was born out of the need for a more universal and coordinated humanitarian effort during disaster response (Buchanan-Smith, 2003). It was created in an effort to integrate the numerous working agency-specific handbooks that were already in use (Walker & Purdin, 2004). InterAction, the SCHR and MSF initially promoted the project (Walker & Purdin, 2004). The project comprises a Humanitarian charter and a set of minimum standards for humanitarian assistance.

The charter stipulates three basic principles (Sphere, 2004):

- *"The right to life with dignity,*
- *The distinction between combatants and non-combatants, and*
- *The principle of non-refoulement. (refers to the protection of refugees from being returned to places where their lives or freedoms could be threatened)"*

Minimum standards for human assistance were created for five basic sectors: Water supply and sanitation, shelter and site planning, nutrition, food aid and health services (Sphere, 2004). The efficacy of these standards is continually being monitored and evaluated, leading to continuing revision of the standards based on lessons learned and past experiences (Sphere, n.d.).

The Hyogo Framework for Action (HAF) has become one the common frameworks used by various organizations involved in disaster management (Basher, 2008). It is named after the Hyogo prefecture in Japan where it was adopted during the 2005 World Conference on Disaster Reduction (UNISDR, 2005). This was in response to requests from national states and various agencies for a more proactive approach to dealing with disasters. The framework is a "global blueprint for disaster risk reduction efforts" that was agreed upon by 168 governments (UNISDR, 2005). Its main priorities are listed in Appendix 1.

HAF outlines specific actions that states, regional organizations, institutions and international organizations can do to reduce the vulnerability of communities to disasters (UNISDR, 2005). For example, the framework advises governments to demonstrate strong political determination to promote and integrate disaster risk reduction into development programming (UNISDR, 2005). It also pushes for the implementation of the HAF into everyday practices of the different stakeholders (Basher, 2008; UNISDR, 2005).

There is an array of humanitarian assistance handbooks and guidelines used by various organizations. Some of these are adaptations of the SCHR Code of Conduct and the Sphere project; in an effort for different organizations to respond to some of the criticisms of these international guidelines. The more commonly used guidelines will be discussed in this paper: The SCHR Code of Conduct, Hyogo Action Framework, and the Sphere project. In addition to the guidelines that each organization adheres to, agencies also have to comply with the laws of the affected countries and to various international and humanitarian laws (IFRC, 2008a; Stover & Vinck, 2008; Young, Taylor, Way & Leaning, 2004). The International Disaster Response Laws, Rules and Principles (IDRL) are a set of legal guidelines that help governments and agencies “prepare for common legal problems in international response operations” (IFRC, 2008a). These recommendations aim to “reduce red tape and strengthen accountability” but are not legally binding (IFRC, 2008a).

Disasters and Development

Disasters do not affect all individuals in the same manner (de Ville de Goyet, 2008; IFRC, 2007; UNDP, n.d.). The impacts of disasters are exacerbated by preexisting vulnerabilities in the community; vulnerabilities ingrained within the social, political and economic context (Cannon, 2000; Peduzzi, Dao, Herold & Mouton, 2009). There is discrepancy not only in the number of times that particular areas experience a natural disaster (Dilley et al., 2005) but also the effects that each disaster has on different groups within a population (von Oelreich, 2002; IFRC, 2007). "Disasters have a disproportionate impact on the poorest and most vulnerable population including women, children, youth and the elderly" (Peduzzi et al., 2009). De Ville de Goyet describes it as "strong relationship between vulnerability to natural disasters and poverty" (de Ville de Goyet, 2008). Trend analysis shows that between 1995 and 2004, ten times as many people died per natural disaster in developing countries than in developed countries (IFRC, 2004). In 2002, only 6% of the people killed by natural disasters lived in countries of high human development index. Economic losses (as a percentage of gross domestic product) were about twenty times greater in developing countries than in developed countries (Kreimer, Arnold & Carlin, 2003; World Bank, n.d.).

As described in Data Against Natural Disasters (de Ville de Goyet, 2008), a study by the World Bank and Centre for Hazards and Risk Research showed that 44 of the 47 countries with more than 50 percent of their population at

relatively high mortality risk from natural disasters, were developing countries. Table 1 illustrates that developing countries have significantly higher numbers of people affected or killed by disasters than other countries.

Table 1: Number of people affected or killed by natural disasters by country development category

	Flood	Wind Storm	Earthquake and Tsunami	TOTAL
Number of People Affected				
OECD	3,680,209	14,565,498	921,522	19,167,229
CEE+CIS	8,823,124	4,051,295	1,285,530	14,159,949
Developing countries	1,858,951,169	382,712,627	43,198,839	2,284,862,635
Least developed countries	142,590,313	34,724,961	739,085	178,054,359
Countries not classified	398,961	891,082	111,527	1,401,570
TOTAL	2,014,443,776	436,945,463	46,256,503	2,497,645,742
Number of People Killed				
OECD	2,150	5,430	5,910	13,490
CEE+CIS	2,635	512	2,412	5,559
Developing countries	97,061	65,258	397,303	559,622
Least developed countries	20,127	149,517	9,247	178,891
Countries not classified	99	767	2,277	3,143
TOTAL	122,072	221,484	417,149	760,705

OECD - countries that are members of the Organization for Economic Co-operation and Development
CEE+CIS - Central Eastern Europe & Commonwealth of Independent States
Adapted from UNISDR (n.d.), showing data from 1991 to 2005. Data shown from EM-DAT : The OFDA/CRED International Disaster Database.
http://www.em-dat.net, UCL - Brussels, Belgium
Retrieved March 3, 2010.

Development

There are different schools of thoughts on the definition of development. The idea of development in the global context was largely inspired by humanitarian considerations to deal with the conditions of poverty, illiteracy and mortality after the Cold War (Eatwell, Milgate & Newman, 1989). There are two general streams of thought among international humanitarian and aid organizations: economic vs. human development. **Economic development** refers to the social and technological progress that facilitates economic growth (Blakely, 1994). **Human development** refers to the process of enlarging people's choices through an expansion of human capabilities and functioning (UNDP, n.d.a). Table 4 in Appendix 2 shows a comparison of economic vs. human development. There is some disagreement on the absolute separation of the two types of development (Gadfrey & Jany-Catrice, 2006; Kalfagianni, 2008; Rashid, 2000; Stathakis & Vaggi, 2006). Others view economic development as being equivalent to human development, or as a process that leads to human development (Gadfrey & Jany-Catrice, 2006; Kalfagianni, 2008; Rashid, 2000; Stathakis & Vaggi, 2006). Whereas proponents for the human development index view these two to be separate, with economic development not guaranteeing human development (Kalfagianni, 2008; UNDP, 1990). The distinction between the two is not important for the discussion of this capstone. Instead, the MDGs, which are a widely accepted guide for the efforts of numerous organizations and countries (Schmidt-Traub, 2009) will be used as the measure of development.

The MDGs are a set of eight goals set to be achieved by 2015 and were agreed upon by 189 nations in 2000 (UN, n.d.). These goals rose out of discussions on how to assist impoverished countries deal with poverty and were established at the Millennium Summit in 2000. There are 18 targets and 48 indicators used along with these goals (UN, n.d.). The goals and their respective targets and indicators are shown in Appendix 2 Table 5. The MDGs are aimed at developing countries, with the "developed countries pledging to assist developing countries achieve these goals through aid, debt relief and fairer trade policies" (UNDP, n.d.b)

Disasters and Development: Reasons to care

Disasters Make Achieving the MDGs More Challenging

Natural disasters have the potential to destroy a country's positive progress towards attainment of the MDGs. The United Kingdom's Department for International Development (DFID) suggests that floods can destroy crops and hinder the goal of eradicating hunger while increasing poverty rates in agro-based communities (as cited in UNMC & ADPC, 2007). Furthermore, an earthquake that destroys schools will reverse the progress towards achieving universal primary education (Goal 2) (UNDP, 2004). Women and children are usually the hardest hit during disasters, making achieving Goals 3, 4 and 5 even more challenging. Populations displaced by natural disasters are also at a higher risk of exposure to the human immunodeficiency virus (HIV) and other infectious

diseases, with the disruption of health services also contributing to the spread of diseases (PAHO, 2000; UNAIDS, 2003). Ensuring environmental stability is also challenging when natural disasters can disrupt environmental processes or destroy entire ecosystems (Noji, 1997; as cited in UNMC & ADPC, 2007). One of the targets for Goal 7 is to halve the number of individuals that do not have access to sustainable safe drinking water; disasters can destroy water infrastructures resulting in an increase of this population segment. The economic toll of disasters in developed countries can make it difficult for these countries to extend debt relief or to help address the needs of the least developed nations while dealing with disasters in their own country (UNDP, 2004; as cited in UNMC & ADPC, 2007). One disaster can affect the progress of one MDG or even the entire set of the MDGs and as weather-related disasters occurrences increase, they become a major obstacle in achieving the MDGs (UN Secretary-General, 2005; UNISDR, 2007; Schipper & Pelling, 2006). Integration of development within relief efforts can increase the chances for regaining the levels of achievements that were in place prior to the disaster and ensure that countries remain on the trajectory toward achieving the MDGs within the specified timeline.

Development Factors are Associated with Increased Negative Impact of Disaster

The frequency and severity of natural disasters is expected to rise as the world faces challenges of climate change (IPCC, 2007). Oxfam estimates that the number of people affected by climate-related disasters is expected to rise by about 50%, to reach 375 million people per year by 2015 (BBC News, 2009). The

Stern report on climate change also suggests that the poorer countries will suffer the most from climate change, and will experience the impacts of climate change sooner than developed countries (McMichael, Friel, Nyong & Corvalan, 2008; Stern, 2006). Other factors reported to be contributing to the rise in severity of disaster impacts are rapid urbanization, population growth and environmental degradation (IFRC, n.d.d; World Bank, n.d.). These factors are even more prominent in developing countries that have greater rates of rural-urban migration. The most rapidly growing populations are also within developing countries, which puts further strain on the environment due to overpopulation and poor land use (Jiang, Young & Hardee, 2008; Noji, 1997). Densely populated cities are at a greater risk of high mortality or the number of people affected during a natural disaster. Poor warning systems and response mechanisms, which are more common in developing countries, also contribute to relatively higher mortality rates during impact (Tolentino Jr., 2007; UNISDR, n.d.). Rapid industrialization in developing countries can also contribute to both environmental degradation and climate change (Jiang et al., 2008). The Intergovernmental Panel on Climate Change (IPCC) projects an increase in cyclone intensities and winter flooding with increased water stress in Africa and Asia by 2020 (IPCC, 2007). Development may help reduce these disaster vulnerabilities, especially in developing countries and reduce the impacts of future disasters. Better yet, development can help reduce some of the factors such as climate change that actually contribute to this expected rise in the frequency and severity of disasters.

Shared Resources between Disaster Response and Development

There is a growing tendency for the same players involved in disaster relief to include development on their agendas (Smillie, 1998). The UN is a major player in disaster response, with country offices also working towards development in various developing countries. Humanitarian organizations involved in disaster response such as OXFAM, CARE, Red Cross and Save the Children also have national offices working on developmental agendas. In recent years, the World Bank and other developmental banks have also become major players in disaster response, shifting funds earmarked for developmental efforts towards disaster relief and reconstruction (Kreimer et al., 2003; Dilley et al., 2005). As of March 2010, all of the ten countries on OCHA Financial Tracking System's list for funding appeals for 2010 were developing countries also receiving other forms of developmental aid (Fig. 6). (ReliefWeb, 2010; OECD, n.d.; World Bank, n.d.a)

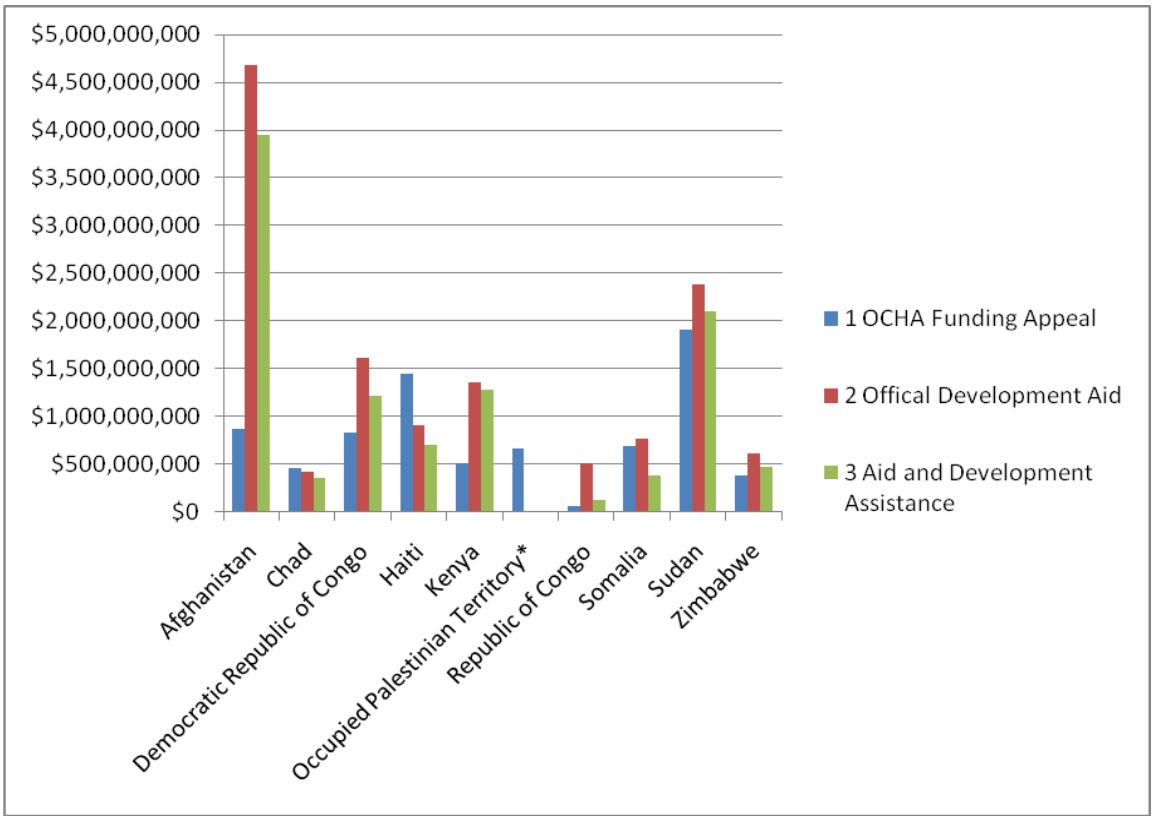

Figure 6: Graph of selected countries receiving relief and development funding.

All figures shown in current US$

*No information from OECD and World Bank

[1] Amount requested for the proposed projects in 2010

[2] Development Aid from OECD countries in 2008

[3] Assistance Aid through World Bank in 2007

This illustrates the interrelatedness of the two processes, exemplifying how disaster and development can no longer be disengaged from each other. The World Bank study on disaster hotspots further points out that “disaster relief costs drain development resources from productive investments to support consumption over short periods” (Dilley et al. 2005). With the increasing frequency and severity of disasters, both limited financial and human resources are slowly becoming overwhelmed. Relief and development should therefore be

considered together in a manner that ensures equal attention without competing for resources.

Disaster rehabilitation should strive to go beyond saving lives by aiming at reducing future vulnerabilities present at individual, community, national and global levels. Evidence has shown that disaster vulnerabilities are also associated with level of development; with a majority of the 'hotspot' countries identified also being underdeveloped (Dilley et al. 2005). Elements of disaster vulnerability such as lack of resources and environment degradation also represent elements through which levels of development are assessed. The inverse is also true; disasters result in hardships that are similar to those characteristic of underdevelopment such as limited access to education, health and livelihood options. Vulnerabilities do not occur at one moment, but rather progress over time (Lizarralde et al., 2010). The disaster "pressure and release" model (Figure 7) demonstrates this accumulation and in turn emphasizes the need to focus on immediate vulnerabilities, the "dynamic pressures" and the "root causes" (Wisner et al, 2004). Disaster response that takes into consideration development goals is more likely to address both the causes and the impacts of a disaster for long term sustainable changes in the lives of the vulnerable population.

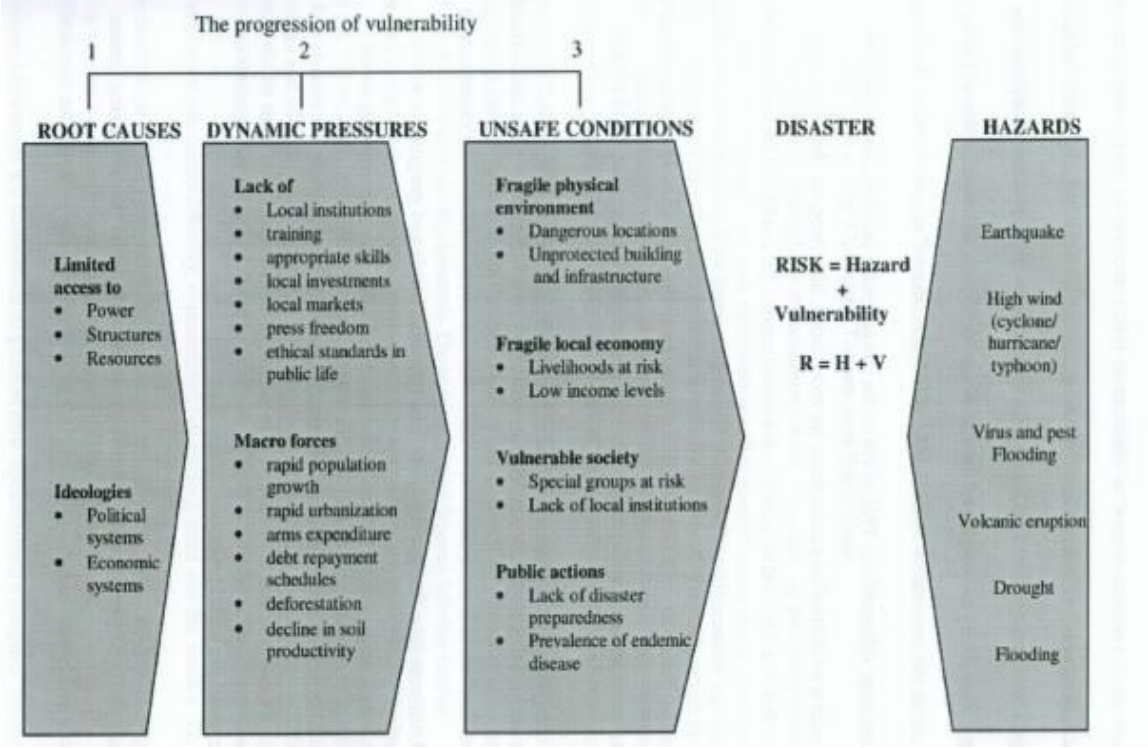

Figure 7: Pressure and release model: the progression of vulnerability. (Wisner et al., 2004). Figure from www.maf.govt.nz/.../page-4.jpg

METHODS

Findings on how the floods that occurred in Barmer created opportunities for positive outcomes provided the basis for this capstone project. Initial objectives were to assess how disaster response efforts were taking advantage of the opportunities created by disasters to promote long-term development at a national level. Initial literature review conducted showed very little information on the impacts of disaster response efforts on overall development of affected countries. These findings (or lack thereof) informed the objectives of this capstone: to discuss how disaster response efforts are and should be used for positive long-term developmental impacts and how development efforts before a disaster can also be used to reduce the negative impacts of a disaster. A flowchart of the capstone process is shown in Figure 8.

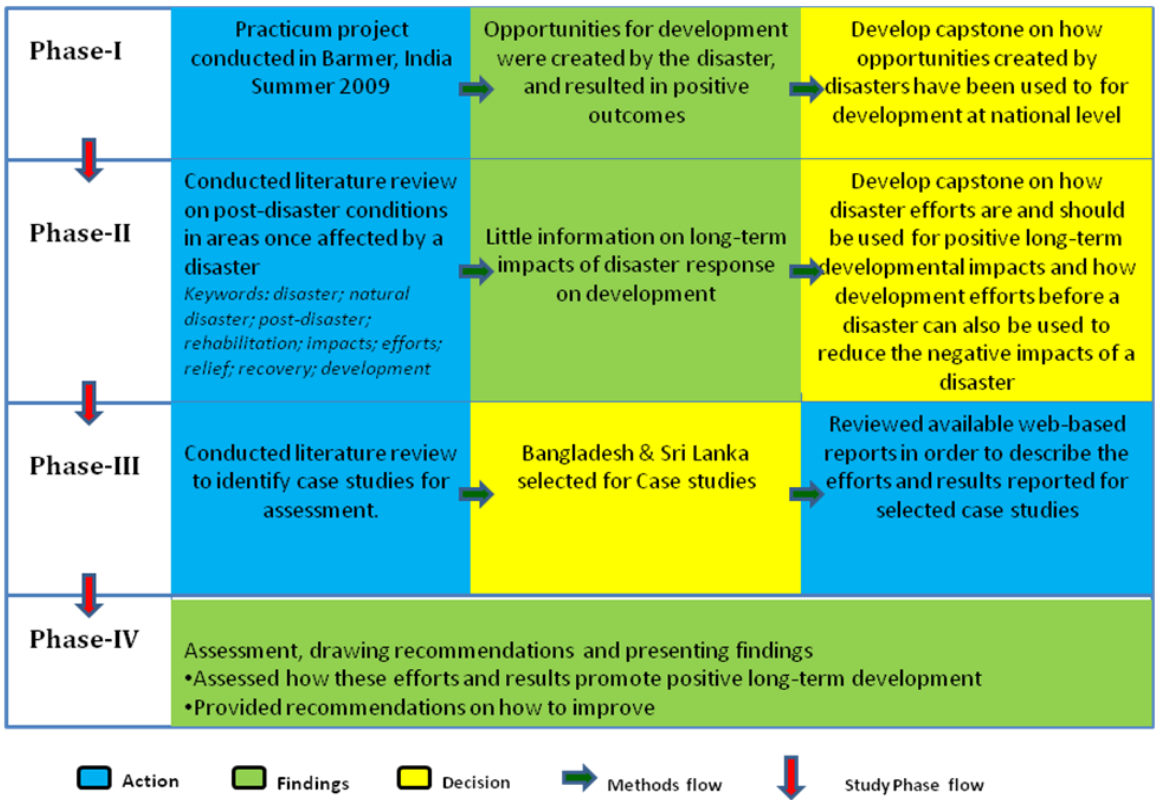

Figure 8: Flowchart of Capstone Methods

In an effort to achieve findings that could be used in Barmer, India, case studies for review had to be in countries within the same regional block of South Asia. The complete criteria and justifications that guided selection of countries for case study were:

1. *Geographical placement:* Disaster occurred in the South Asian regional block – to be comparable with India

2. *Nature of Disaster:* Meteorological or hydrological natural disaster – similar impacts for ease of comparison

3. *Impact of Disaster:* Disaster affected at least 100,000 people – to assess large scale efforts

4. *Focus period for assessment:* Disaster occurred between Jan 1, 2000 and Dec 31, 2004 – to allow for a minimum 5 years to assess long-term results

5. *Nature of Post-Disaster Support:* Local and international players responded to the disaster – to assess large scale disasters that overwhelm local capacity

6. *Availability of documented evidence:* Web-based progress reports from UN agencies, SCHR members and/or development agencies are available – since the internet was the medium most accessible for research of this capstone

Of seven countries reviewed, the Asian Tsunami in Sri Lanka, 2004 and Bangladesh floods of 2004 met the above stated criteria, and were selected as case studies for the capstone. Appendix 1 shows the disasters that met the first four criteria given above (as shown on EM-DAT) but did not satisfy the rest of the criteria. An assessment of web-based progress reports of the disaster response efforts by UN agencies, international humanitarian and development organizations was conducted. The assessment was aimed at identifying the efforts undertaken by the different players and the results described in these reports. The findings were used to discuss if and how these efforts promoted long-term development.

The capstone will include information from the IFRC, UN agencies, World Bank, ADB, Save the Children, Oxfam, MSF along with local governments and disaster committees. The international humanitarian organizations and agencies selected are key players in disaster relief and/or development in many countries, providing a frame of reference for the evaluation of efforts in different countries. These larger organizations also have a greater influence on overall countrywide results.

Two popular frameworks used by international organizations were selected for the purposes of the discussion; HAF and the Sphere project. HAF pays greater attention to risk reduction and so this framework will be primarily utilized to guide the discussion on the mitigation and preparedness stages (UNISDR, 2005). The Sphere project guidelines for relief and rehabilitation will be used in the assessment and discussion on these stages (Sphere, 2004). The MDGs will be used as measures of development that are relevant to the countries selected as case studies. The EM-DAT database used by a number of these organizations and national states will inform this discussion.

Limitations

1. *Limited Data Collection*

There is limited or no data collection before or after a disaster occurs and in some instances the data collected is superficial (de Ville de Goyet, 2008; Noji, 1997a; Sasin, 2008). One reason is that in most low resource areas, there are insufficient data collection systems or surveillance systems (Wisner et al., 2004). Once a disaster occurs data collection is often shelved as organizations deal with the myriad of immediate needs that include, but are not limited to search and rescue and containment of the hazard (Wisner et al., 2004). Another reason may be due to a lack of funding for evaluation, which may limit the amount and quality of data collected for evaluation purposes (de Ville de Goyet, 2008; IASC, 1994). There are also gaps in routine data collection, for example, data on the MDGs is not always available for each year. As a result, there was insufficient data to objectively assess disaster impacts or evaluate whether or not relief efforts have re-established, improved or regressed on pre-disaster functioning.

2. *Limited Accessibility*

There was also a limited amount of publicly accessible information on the relief and rehabilitation activities undertaken and their associated results. Some of this inaccessibility is due to the temporary nature of some public and private disaster response groups that dissolve along with their associated information regarding their relief and rehabilitation activities once the immediate emergency has subsided (Sinha & Srivastava, 2002). Inaccessibility may also have been due

to a lack of electronic information and a lack of access to information that may only be available in print. Despite the increased internet usage in developed countries, the same is not true in most developing countries (UN, n.d.). Security measures can also negatively affect accessibility and in some instances political concerns may result in restrictions on the type of information that is publicly available (de Ville de Goyet, 2008a; Murphy, 2000; Sasin, 2008).

3. *Data Accuracy Issues*

Accurate data is very important in ensuring informed decision-making (de Ville de Goyet, 2008) and in assessing the impacts of a disaster and the proceeding response efforts (Sinha & Srivastava, 2002). Statistics on the number of people killed or affected by a disaster differs from one source to another, with no universally accepted criteria for determining which is accurate. Disasters can affect different people in different ways, and at times these effects are not apparent soon after the disaster occurs; which can skew data collected. Different organizations can also skew information for political or financial reasons (de Ville de Goyet, 2008a; Sasin, 2008; Wickramasinghe, 2005). In this respect, it is difficult to accurately assess the actual number of people affected when presented with statistical data that fails to be impartial.

All these limitations should be taken into consideration when reading the findings and discussion sections of this capstone.

FINDINGS

Case Study: Tsunami in Sri Lanka

The island of Sri Lanka is a developing country situated in the Indian Ocean. On December 24th, 2005, the Asian tsunami ravaged many coastline districts of Sri Lanka including its capital of Colombo; killing over 35,000 people (ADB, 2005; EM-DAT, n.d.c; IFRC, 2005; OCHA, 2005). The tsunami resulted in damages of almost US$1.32 billion in Sri Lanka alone (EM-DAT, n.d.c.; TAFREN, 2005; OCHA, 2005).

Table 2: Activities and Results reported on 2004 Tsunami Disaster Response & Recovery in Sri Lanka

Pre-Disaster Vulnerabilities	• There were no early warning or communications systems • There were no disaster management plans at national or local levels • There was a general lack of disaster preparedness at all levels • The public was unfamiliar with tsunami warnings e.g. when the water receded greatly (a sign of an incoming tsunami wave), some people went out to the beach to collect stranded fish • Environmental degradation had destroyed natural barriers such as coral reefs and mangroves • 25% of the population was below the poverty line • Civil conflict in north and eastern coastline areas between the government and the Liberation Tigers of Tamil Eelam (LTTE); only ended in May 2009
Organizational Response	External • Generated a lot of international humanitarian attention (received US$166 million relief assistance through OCHA) • There was poor coordination among the multitude of players • Humanitarian organizations formed the Tsunami Evaluation Committee (TEC) to evaluate their efforts • OCHA conducted a flash appeal to raise funds for relief efforts by UN agencies and other international humanitarian organizations • The Intergovernmental Coordination Group for the Indian Ocean Tsunami Early Warning and Mitigation Systems (ICG/IOTWS) was formed Internal • Government of Sri Lanka formed the Center for National Operations (CNO) to oversee and monitor emergency programs • Sri Lanka created legislation for the formation of the National Council for Disaster Management (NCDM) and the Task Force for Rebuilding the Nation (TAFREN) • Central government was responsible for large scale projects such as national highways and railways • Provincial government was responsible for rehabilitation of schools, hospitals, agriculture and fisheries • Local communities were responsible for enterprise development, housing and micro financing

Disaster Response Activities	Health • Assessments of disaster impacts on health were conducted • Temporary health facilities & disease surveillance systems were set up to reduce subsequent mortality and outbreak of illnesses; no major outbreaks identified • Mobile health teams were deployed to provide medical assistance and donations of medical supplies were received • Psycho-social services and psycho-social training was provided in affected communities, especially those affected by both the tsunami and the conflict • Food was distributed to those affected by the tsunami, with nutritional supplements provided for children, pregnant women, seniors and others with weak immune systems • Displaced individuals were relocated to temporary shelters (made from donated materials such as tents) and away from damaged water and sanitation systems with donations of essential household utensils (family kit) Livelihoods • Employment in debris removal & construction through food-for-work and cash-for-work programs was provided • Boats were donated for local fishermen and harbors and anchorages were reconstructed • Some organizations introduced rapid income-generating projects for women e.g. cultivation of ornamental plants, bee keeping, weaving and lace making • Vocational training was provided in affected communities (e.g. community health workers & disaster management) Education • Makeshift classes were conducted for children under 12 at the relief camps • More than 25 schools were reconstructed (numbers and levels unspecified in other reports) • Educational materials were distributed to various affected communities • At-school feeding programs were introduced in some communities Shelter • Construction materials were donated • 100 destroyed health centers were reconstructed along with upgrades to 100 other centers that had not been damaged by the tsunami

	• 500 permanent houses had been constructed by the end of 2005, with funding available for over 30,000 more houses by the end of 2009 • Water and sanitation projects such as construction of latrines, drainage systems and provision of household water filters were taken up Environment • Assessments of disaster impacts on the environment were conducted • There was a law created that forbad settlement close to the sea, resulting in the relocation of some communities away from coastal areas • Levees were constructed along the coastline • Mangroves were planted along the coastline Disaster Reduction • An interim tsunami advisory information system was put in place via the Pacific Tsunami Warning Center (PTWC) and the Japan Meteorological Agency (JMA) • Community evacuation centers were constructed in some communities • Local communities were trained in disaster risk mapping and disaster management • Communities created local emergency response teams
Progress in MDGs	• No data in reference to the progress towards the MDGs in reports • Gaps for 28 out of 48 MDG indicators between 2003 and 2009 • Currently on track for 5 out of 8 of the goals (2008)

Case Study: Bangladesh Floods

Bangladesh is a least developed country and one of the most flood-prone countries in the world, experiencing an average of 2.17 floods per year (Dilley et al. 2005; EM-DAT, n.d; OCHA, 2004). Its main rivers include the Ganges (Padma), Brahmaputra (Jamuna) and Meghna rivers. Heavy monsoon rains hit the country on 27 June 2004 and subsequent storms led to flash flooding in the northern and west-central districts of Bangladesh (ADB, 2004; OCHA, 2004; UN HABITAT, 2009). The flood affected 36 million people, leaving almost a quarter of the population homeless and killing about 800 people (ADB, 2004; EM-DAT, n.d.d). The economic damage was estimated at US$2.2 billion (EM-DAT, n.d.d). In September of the same year, heavy rains again affected areas flooded in June and others that had been spared during the earlier flooding (ADB, 2004).

Table 3: Activities and Results reported on the Bangladesh Floods Disaster Response & Recovery

Pre-Disaster Vulnerabilities	• It is a densely populated country • The country was (and still) undergoing rapid urbanization • 40% of the population was (and still is) under the poverty line • Low lying coastal areas were (and still are) sensitive to rises in sea level • Increase in water levels of the main rivers due to snow melting in the Himalayas (as a result of climate change) • Poorly constructed dams and riverbanks
Organizational Response	External • OCHA conducted a flash appeal to raise funds for relief efforts (US$210 million) by UN agencies and other international humanitarian organizations on July 28, 2004 • The Local Consultative Group (LCG) created the Disaster and Emergency Response (DER) team to conduct damage and needs assessments • International attention was shifted away from Bangladesh to the Darfur crisis during the year and to respond to the Asian tsunami in December Internal • Ministry of Food and Disaster Management activated flood response plans • Local emergency response committees implemented and coordinated disaster response efforts • Flood Forecasting and Warning Center continued to issue updates on water levels of rivers and tributaries
Disaster Response Activities	Health • 800 temporary health centers were established • Medical teams with specialties in water-borne diseases were deployed to different districts to deal with increased prevalence of diarrhea and water-borne diseases • Measles vaccination campaigns were conducted in the flood centers • Food was provided for affected families through the government's Vulnerable Group Feeding (VGF) program Livelihoods

	• Lending programs planned by ADB • Winter crop seeds were distributed to families with access to land • Cash-for-work programs were introduced to repair community facilities Education • Identified as an area of focus and funding, but no specific activities described Shelter • Temporary housing was provided for 1.7 million people using materials donated from humanitarian inventories • Basic household utensils were distributed to affected families (includes cooking utensils, plates, cups, spoons, bucket, soap, candles, match boxes and a plastic weave bag) Environment • Discussed as an area of focus, but no specific activities identified Disaster Reduction • Community-based disaster management training was provided (number of communities not specified) • Revision of flood warning and communication systems
Progress in MDGs	• No data in reference to the progress towards the MDGs in reports • Gaps for 28 out of 48 MDG indicators between 2003 and 2009 • Currently on track for 2 out of 8 of the goals (2008)

DISCUSSION

There were numerous factors identified as contributing to increased disaster vulnerability. For one, poverty has a great influence on people's ability to build strong houses that can withstand the impact of hazards. Poor individuals also have a more difficult time recovering from a disaster, for example in Bangladesh poor individuals sold most of their belongings during the floods in order to afford food and other basic goods, making it even more difficult to regain their assets after the disaster (DER, 2004; OCHA, 2004a). Poverty can also drive the rural-urban migration resulting in overpopulation in urban areas, increasing pressure on water and sewer systems, as was the case in Bangladesh (UNICEF, 2008). Disasters can exacerbate pre-existing problems of poor water and sanitation systems and pose health risks such as diarrhoea and typhoid; increasing mortality and morbidity (UN HABITAT, 2009; UNICEF, 2008). Overpopulation also exposes larger proportions of the population to a given hazard and puts a further strain on resources available to deal with the disaster. Such strains may discourage rehabilitation efforts, as was the case in Bangladesh where IFRC cancelled its house reconstruction project because it did not have enough resources to allocate fairly to those affected by the floods (IFRC, 2005a). A relief project that provided more family kits replaced the housing project (IFRC, 2005a). In cases of highly constrained resources and high demand, organizations should still strive to formulate rehabilitation programs

whenever possible given the resources available. If no other alternatives are possible, then a different set of criteria to select those receiving aid can be created. The lack of distinct local leadership and planning can make such decision making extremely challenging since such criteria must be established according to local priorities. In any case, housing for 500 families today can mean 500 less families affected in the future as opposed to the same (or even greater) need during future disasters. Extra family kits are a temporary fix to current needs, which did not reduce the impact of future floods, reduce disaster vulnerability or positively contribute to overall country development.

The negative impact due to the lack of early warning and communication systems was especially evident in Sri Lanka, where the UN estimates that such systems may have saved thousands of lives (UN, 2005; 2006). There were no tsunami early warning systems in the Indian Ocean because tsunamis were not as common as in the Pacific Ocean where warning systems have been in place since 1949 (UN, 2005). The Asian tsunami of 2004 illustrates the need for multi-hazard early warning systems, even in places where a particular hazard may be unlikely. According to the IPCC, climate change will contribute to a change in the type of hazards that different countries will face (IPCC, 2007), therefore single-hazard preparedness systems can no longer suffice and proactive risk assessment is ever more important (IFRC, 2009). Formation of groups aimed at creating tsunami early warning systems in the Indian Ocean was a disaster response activity that translated into mitigation and has potential benefits that

extend beyond immediate 2004 tsunami players. The system also provides warning to all other countries exposed to the Indian Ocean, increasing global cooperation (MDG 8) and reducing overall risk beyond the immediate tsunami. On the other hand, early warning and communication systems are only useful when people have the knowledge and ability to protect themselves. For example, there were not enough evacuation centres in all affected regions of Bangladesh, and despite the warnings, some residents simply had nowhere to hide (Cook, 2008; OCHA, 2004a). The availability of both information and means are important in reducing vulnerability to disasters (Randall, Navaratne, Rand, Hagos & Jones, 2009). Efforts to provide disaster management training to local residents in Bangladesh and Sri Lanka aimed to improve knowledge on disaster risk, while construction of evacuation centres provided the means. These activities reduce overall vulnerability of the communities, and depending on how issues of local maintenance are promoted, can result in safety benefits viable for an extended period. Unfortunately, reports identified on the Bangladesh floods of 2007 did not comment on the level of local preparedness as compared to 2004. Presumably, risk reduction knowledge and assets would be passed on to future generations and reduce the negative impacts of disasters on those generations.

Economic development that degrades the environment increases the extent to which communities are vulnerable to the negative impacts of disasters. Destruction of coral reefs and mangroves in Sri Lanka to create tourist resorts and shrimp farms reduced the effectiveness of the natural barriers that could

have reduced the impact of the tsunami (Cochard et al., 2008). Environmental degradation can also contribute to the negative effects of climate change (IPCC, 2007), which further increases vulnerability to disasters (Unnayan Onneshan, 2008). Economic activities should be balanced with good environmental management practices that reduce the negative impacts of a disaster. Reconstruction of mangroves and creation of environmental laws in Sri Lanka were positive measures in ensuring long-term impacts that reduce the negative impacts of future disasters. These measures can also work to promote achievement of MDG7 for environmental sustainability.

Economic development can also influence where people live, whether it is in overpopulated urban slums close to where the industries are located, or near the sea for fishermen. Development should create economic alternatives that remove people from areas of higher disaster vulnerability. Livelihood revival in Sri Lanka focused mostly on the fishery industry, with not a lot of activities aimed at diversifying economic opportunities. This was not sustainable because the laws to relocate people away from the coastline meant some fishermen lived too far and were no longer able to take part in the fishing sectors. Diversified economic opportunities can help ensure economic continuity after a disaster even if one or two economic sectors are negatively impacted (Phillipe, Bruno, Stefania & Stefano, 2008). In Bangladesh, very little was done to promote long-term economic development except for those who already had land. Other employment opportunities created were limited to rebuilding donor funded

centres, without any provisions for further employment after those projects were complete. Such projects therefore only focus on the immediate needs, but do not reduce overall poverty or unemployment. Such narrow sightedness may have been circumvented by better integrating reconstruction and livelihood revival. It is important to understand the interrelatedness of activities in different sectors, a notion that was not evident in the progress reports, which mainly described 'siloed' projects. The potential negative impact that importing rice as food aid in Sri Lanka had on local rice farmers' profitability also demonstrated how a 'siloed' food aid program did not anticipate its effects on livelihoods (OCHA, 2005a). Projects can meet immediate needs of affected communities but inadvertently repress progress during the rehabilitation stages.

Poor coordination among the different players and ad-hoc procedures in Sri Lanka were found to be ineffective in ensuring the transition from the relief stage to the rehabilitation stage (Cosgrave, 2007; Telford & Cosgrave, 2007). Competition for funds contributed to lesser coordination in Sri Lanka (Cosgrave, 2007). Competition for funding also contributed to organizations opting for short-term activities that would yield visible results earlier, in response to the increased pressure from donors and the media (Christoplos, 2006).

Despite a lack of detail on the long-term impacts of immediate health response efforts, possible long-term impacts can be speculated. The relief efforts in both case studies managed to capitalize on populations aggregated in relief

camps to provide vaccinations and health education. These interventions can translate into relatively long-term impacts, for example, the large number of individuals vaccinated could provide herd immunity for a relatively long period of time (Yash, 2004). Vaccination activities may have also changed local perceptions regarding the advantages and disadvantages of immunizations if children vaccinated in the camps fair better than those not vaccinated did. In the same manner, health education may have also changed perceptions on health risks and behaviours, and to provide a channel to further disseminate this information via word of mouth. Once again, the separation between disaster response activities and other development efforts resulted in a lack of information to measure if activities within the relief camps translated into overall changes in perceptions of health issues. The decision to renovate undamaged health centres in Sri Lanka demonstrated the realization that pre-existing deficiencies also needed to be addressed. There is however, no insight into whether or not the newly constructed hospitals contributed to improvements in health care service delivery and ultimately the health of the community.

The limited amount of information on the activities during the Bangladesh floods as compared to the Asian tsunami in Sri Lanka is noteworthy. The floods in Bangladesh did not garner as much international attention as did the tsunami, which is also evident in the amount of information available (Cosgrave, 2007). The Asian tsunami generated a lot of humanitarian funding (aggregate for all affected countries) and in turn greater pressure for organizations to publicly

account for those funds (Christoplos, 2006). This is not to imply that there was better accountability for one disaster response over another, but rather more information may have been made available to the public in order to reach the greater range of donors during the tsunami. The amount of attention also affects the amount and type of resources gathered, which in turn influences the number and type of projects that can be implemented. In-kind donations described in the reports such as tarp, family kits, blankets, lentils, rice, etc., showed the greater focus on the relief stages of disaster response. This may be as a result of restrictive organizational mandates such as OCHA's flash appeal mandate which does not accept projects with the terms "permanent" or "recovery" (de Ville de Goyet, 2008). Earmarked funds were also largely focused on disaster relief e.g. OCHA flash appeals of US$166 million and US$210 million for Sri Lanka and Bangladesh respectively. Most donations to Bangladesh that were recorded on the Financial Tracking Systems, a system that records international humanitarian assistance, were aimed at the immediate needs and relief stage, with very few pledges toward reconstruction. Funding in this manner promotes agencies to undertake relief activities as opposed to long-term rehabilitation activities. Earmarked funds can also overwhelm some sectors and neglect others, restricting progress in some sectors such as environmental recovery in Bangladesh. Donors therefore play a crucial role in determining what activities are favoured.

The shift of resources from Bangladesh to tsunami-affected regions also demonstrates how the amount of attention can drive disaster response and rehabilitation efforts. Only two international organizations (OCHA & ADB) mentioned the Bangladesh floods in 2005, after the tsunami hit. The shift in attention may explain the lack of information on long term activities in the Bangladeshi disaster reports, or the lack of such activities thereof. This attention shift also provides an example of why it is important to integrate long-term developmental efforts with relief efforts. The increase in natural disaster occurrence means that there is greater competition for resources. Organizations should therefore aim to begin rehabilitation (and development) sooner and ensure that this process does occur while attention and resources are still available. Earmarked funds again influence organizations' ability to integrate the two processes.

Projects described in the various progress reports did not explicitly address how efforts selected were linked with ongoing development efforts such as achieving the MDGs. It is difficult for response efforts to work as a faction of overall development efforts if the links between development and disasters are not discernable in the plans that guide them (Christoplos, 2006). For example, the TAFREN recovery plan for education discussed the reconstruction, renovation and relocation of destroyed schools without any links to accessibility or quality concerns as relevant to MDG Goal 2. Another example is how gender equity (MDG 3) was not addressed in some projects such as livelihood revival;

with most of the projects aimed at men (Ratnam, 2000). This exclusion may represent a lack of understanding of the links between disasters and the MDGs.

Monitoring and evaluation of disaster response plans as described in the reports, neglects the outcomes and impacts of the activities conducted, simply reporting on the amounts of money or materials used, activities undertaken and the immediate outputs of those activities. The indicators used to measure disaster response demonstrate the limited focus only on relief rather than rehabilitation. Table 6 in Appendix 2 shows the different indicators discussed by different agencies in their disaster response reports and annual reports. The indicators used are not comprehensive to establish the success or failure of disaster response in relation to development. It is difficult to assess how these activities therefore improve the lives of those affected. Long term results were even less evident for Bangladesh as attention was shifted from the floods to respond to the Asian tsunami. The role of the media in generating and maintaining this attention cannot be ignored. A Google news search for 'Bangladesh floods 2004' and 'Sri Lanka tsunami 2004' generated 4 and 279 stories respectively (March 4, 2010).

The local context should guide disaster response efforts. Decisions on 'who receives what assistance when' should be guided by the context. Recurring disasters, such as in Bangladesh may require rapid transitions from relief to rehabilitation in order to better prepare affected communities to deal with the

future hazard. Acute disasters may instead result in extreme damages that result in greater emergency relief needs. The context also dictates how resources are shared especially when there are other disasters occurring concurrently, such as the civil war in Sri Lanka that delayed rehabilitation efforts in some areas. Resources donated should also be tailored to the local context unlike the unseaworthy boats donated to fishermen in Sri Lanka after the tsunami.

Relevance to Current Context

In the current global picture, the earthquake that struck Haiti on January 12, 2010 provides a model example of when the links between development and disasters are important. The country shared similar pre-disaster vulnerabilities as those described for the two case studies above such as political strife and high levels of poverty (UN, 2004; UNDP, 2009). Haiti is ranked 149th of 182 countries on the Human Development Index (UNDP, 2009) and is prone to frequent earthquakes and cyclones. When the earthquake hit, the country was still recovering from the lingering effects of a tropical storm and three hurricanes all experienced in the summer of 2008 (Anonymous, 2010). According to the latest available information, Haiti was on track for only one of the eight MDGs as of 2008(MDG Monitor, 2008). The earthquake itself reduced much of the infrastructure down to rubble and further weakened communication, surveillance, health, education and water and sanitation systems among other things (UNICEF, 2010). Haiti has received a lot of attention from individuals, international humanitarian organizations, NGOs, UN agencies, private companies and numerous governments and their associated agencies. For disaster recovery efforts to result in substantial positive changes, they will have to occur concurrently with development efforts.

Organizations currently working in Haiti should consider the long-term impacts of their efforts in reducing disaster vulnerability, achieving the MDGs and attaining any other relevant development measures. The impact of the disaster

was exacerbated by numerous factors of underdevelopment, which should be addressed during relief and recovery. Rehabilitation should go beyond rebuilding physical infrastructure, but also better understand how the ‘new’ social context can effectively use that infrastructure to rebuild the lives of the affected population. For example, building physically accessible hospitals should be accompanied with livelihood programs so families can afford to use these hospitals and health education programs to know how to use the facilities effectively. Even better, efforts should also go on to reduce the factors that increase their risk of getting sick in the first place. Connections of efforts to underlying factors must also extend to other sectors. A major obstacle in Haiti integrating disaster response with development is a shortage in local experts and authorities with the capacity to facilitate this process. Many ministerial leaders, local NGO workers and locally stationed UN workers who are instrumental in disaster response, rehabilitation and development died or lost their family members during the earthquake (UN, 2010). In as much as governance of disaster response processes in Haiti has been mainly conducted by the United States of America (USA) and the UN (Domeltsch, 2010), capacity building of local governance is important in ensuring local priorities are attended to and that the sustainability of activities after the departure of USA and UN disaster response teams is possible.

RECOMMENDATIONS

HAF and the Sphere project provide good suggestions for disaster reduction, preparedness and disaster relief. The recommendations given below are in addition to those already described in the HAF and Sphere project.

1. ***Build capacity of local governments to implement and maintain disaster reduction systems***

- At the *very least*, a country must be able to afford to create and maintain preparedness plans and to establish necessary early warning and information systems for the hazards that they are prone to. This bare minimum however is not adequate because it leaves countries vulnerable to the unpredictable changes in disaster occurrence resulting from climate change.

- Regional cooperation with countries prone to similar hazards should be promoted because it can provide a means for ensuring commitment and accountability even when governments change. Risk pooling among regional partners also ensures maintenance of shared early warning and information systems even when one country is unable to contribute due to civil unrest or economic depression.

- In addition to suggested indicators for MDG 8 Target 5 aimed at making new technologies available, the transfer of disaster risk-reduction technologies is even more crucial.

2. Include elements of disaster reduction in development efforts

- Development should not create or ignore future vulnerabilities but should rather address the root causes and dynamic pressures facilitating unsafe conditions. Disaster reduction should be integrated into efforts aimed at achieving the MDGs e.g. including risk reduction in schools while achieving universal education.

- Development agency mandates should be more flexible to include elements of disaster management even if their set priorities are only for education or child health.

- At each stage of development, developers should work to identify elements that make their activities vulnerable to disasters and implement appropriate measures to reduce those vulnerabilities.

3. Include elements of development in disaster response efforts

- Disaster response plans should include how disaster relief and rehabilitation efforts relate to local development efforts and development requirements to better align disaster response and development.

- Include development efforts in relief efforts to minimize the gap between relief and rehabilitation and reduce vulnerability sooner.

- Rehabilitation should consider pre-disaster vulnerabilities along with vulnerabilities created by the disaster.

- Evaluation of disaster response activities must include outcomes and impacts on development. The MDGs indicators can be used for this evaluation along with any other local indicators agreed upon in disaster response plans.

- Donors must allow unearmarked funding to allow for multi-sectoral projects, which integrate development and disaster response. Deadlines on the use of grants should also be extended to allow for developmental efforts that usually take longer to implement.

- The media should highlight disaster response projects that promote development in order to influence key players to implement sustainable projects.

A sample logic model for livelihood rehabilitation (Figure 9) in Sri Lanka is shown in Appendix 3 as a tool for ensuring development in planning and evaluating disaster response. This model can be adjusted for other sectors and to fit changing local needs and resources. It is important to note that each sector influences and is influenced by other sectors.

Potential Challenges of Recommendations

Implementation of these recommendations may be challenging in practice. Limited financial, technological and human resources can make it difficult to establish even the minimum required preparedness plans, early warning and communication systems or to include disaster reduction elements in development. There may also be a limited number of people with the expertise in development and disaster reduction to effectively integrate them in practice. Limited resources may also inhibit the ability for organizations to extend their mandates to include development. Agencies may not be willing to change their mandate in an effort to maintain their organizational identity.

The dilemma between current needs vs. future needs can be challenging for decision makers. It can be even more challenging when the local community and the funding agencies do not agree on which needs to address. This dilemma may result in organizations focusing more on short-term outputs rather than the impacts. Impacts also take time to occur and may be intangible, which can be discouraging for some organizations or local residents. This also means that organizations reliant on donations may be less interested in development agendas, since successes cannot be demonstrated to entice future donations.

There is also a general lack of established and internationally accepted indicators that tie together development and risk reduction or relief and development. Though the MDGs are suggested as measures of development in

this capstone, these indicators have also received their own criticisms. Greater research needs to be done to create indicators that better measure the relations between disasters and development.

CONCLUSION

It is important for development and disaster reduction to be integrated in practice. Disaster response efforts should foster long-term development. Simply reinstating the pre-disaster level of development does not actually help affected communities to better deal with future disasters; without proper rehabilitation, the community will continue to be vulnerable. In the same manner, development efforts should also reduce disaster risk and vulnerabilities and abate the negative impacts of disasters. The evident effects of disasters on achieving the MDGs require all stakeholders to take on interventions that help return countries on the path towards achieving those goals. Inclusion of development with relief and rehabilitation can help increase the rate at which affected countries can attempt to attain those goals. This is especially important for countries already below the target rate. Governments, humanitarian organizations, NGOs, community based organizations (CBOs), private corporations, donors and the media are all important stakeholders in the implementation of programs that promote development.

APPENDICES

Appendix 1:

SCHR's Code of Conduct for Humanitarian Organizations

1. *"The Humanitarian imperative comes first.*
2. *Aid is given regardless of the race, creed or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone.*
3. *Aid will not be used to further a particular political or religious standpoint.*
4. *We shall endeavour not to act as instruments of government foreign policy.*
5. *We shall respect culture and custom.*
6. *We shall attempt to build disaster response on local capacities.*
7. *Ways shall be found to involve programme beneficiaries in the management of relief aid.*
8. *Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs.*
9. *We hold ourselves accountable to both those we seek to assist and those from whom we accept resources.*
10. *In our information, publicity and advertising activities, we shall recognise disaster victims as dignified human beings, not hopeless objects."*

Adapted from the IFRC website. Retrieved February 20, 2010.

Priorities of the Hyogo Action Framework

1. *Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.*
2. *Identify, assess and monitor disaster risks and enhance early warning.*
3. *Use knowledge, innovation and education to build a culture of safety and resilience at all levels.*
4. *Reduce the underlying risk factors.*
5. *Strengthen disaster preparedness for effective response at all levels.*

From UNISDR Hyogo framework for action 2005-2015:* Building the resilience of nations and communities to disasters. *Proceedings of the World Conference on Disaster Reduction.* 18-22 January, 2005, Kobe, Hyogo, Japan.

Case Studies Rejected (met first four criteria)

- Bangladesh floods, 2000; 2001; 2002; 2003
- India floods, 2000; 2001; 2002; 2003; 2004
- India tsunami, 2004
- Iran floods, 2001; 2002
- Nepal floods, 2004
- Pakistan earthquake, 2001; 2002
- Pakistan floods, 2001; 2003
- Sri Lanka floods, 2000; 2002; 2003; 2004

Appendix 2: Tables

Table 4: Economic vs. Human Development

Economic Development (World Bank)	Human Development (UNDP)

• Refers to social and technological progress
• Goal is to stimulate local employment opportunities in sectors that improve the community (Blakely, 1994)
• <u>Key Indicators</u>
  ○ School enrolment, primary
  ○ Life expectancy
  ○ Poverty rates
  ○ Gross Domestic Product
  ○ GNI per capita
  ○ External debt stocks
  ○ Annual population growth
	• Refers to the process of enlarging people's choices achieved through expansion of human capabilities and functioning
	• <u>Key indicators</u>
	  ○ Human Development Index (composite measure of life expectancy, educational attainment and income
	  ○ Gender-related Development Index (HDI adjusted for gender inequity)
	  ○ Gender Empowerment Measure (gender equality in economic and political participation and decision making)
	  ○ Human Poverty Index (focuses on measures of deprivation of longevity of life, knowledge and a decent standard of living)

Table 5: Millennium Development Goals, Targets & Indicators

Millennium Development Goals (MDGs)	
Goals and Targets (from the Millennium Declaration)	**Indicators for monitoring progress**
Goal 1: Eradicate extreme poverty and hunger	
Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day	1.1 Proportion of population below $1 (PPP) per day 1.2 Poverty gap ratio 1.3 Share of poorest quintile in national consumption
Target 1.B: Achieve full and productive employment and decent work for all, including women and young people	1.4 Growth rate of GDP per person employed 1.5 Employment-to-population ratio 1.6 Proportion of employed people living below $1 (PPP) per day 1.7 Proportion of own-account and contributing family workers in total employment
Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger	1.8 Prevalence of underweight children under-five years of age 1.9 Proportion of population below minimum level of dietary energy consumption
Goal 2: Achieve universal primary education	
Target 2.A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	2.1 Net enrolment ratio in primary education 2.2 Proportion of pupils starting grade 1 who reach last grade of primary 2.3 Literacy rate of 15-24 year-olds, women and men
Goal 3: Promote gender equality and empower women	
Target 3.A: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015	3.1 Ratios of girls to boys in primary, secondary and tertiary education 3.2 Share of women in wage employment in the non-agricultural sector 3.3 Proportion of seats held by women in national parliament
Goal 4: Reduce child mortality	
Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate	4.1 Under-five mortality rate 4.2 Infant mortality rate 4.3 Proportion of 1 year-old children immunised against measles
Goal 5: Improve maternal health	
Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio	5.1 Maternal mortality ratio 5.2 Proportion of births attended by skilled health personnel
Target 5.B: Achieve, by 2015, universal access to reproductive health	5.3 Contraceptive prevalence rate 5.4 Adolescent birth rate 5.5 Antenatal care coverage (at least one visit and at least four visits) 5.6 Unmet need for family planning

Goal 6: Combat HIV/AIDS, malaria and other diseases	
Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS	6.1 HIV prevalence among population aged 15-24 years 6.2 Condom use at last high-risk sex 6.3 Proportion of population aged 15-24 years with comprehensive correct knowledge of HIV/AIDS 6.4 Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years
Target 6.B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it	6.5 Proportion of population with advanced HIV infection with access to antiretroviral drugs
Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	6.6 Incidence and death rates associated with malaria 6.7 Proportion of children under 5 sleeping under insecticide-treated bednets 6.8 Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs 6.9 Incidence, prevalence and death rates associated with tuberculosis 6.10 Proportion of tuberculosis cases detected and cured under directly observed treatment short course
Goal 7: Ensure environmental sustainability	
Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources	7.1 Proportion of land area covered by forest 7.2 CO2 emissions, total, per capita and per $1 GDP (PPP) 7.3 Consumption of ozone-depleting substances 7.4 Proportion of fish stocks within safe biological limits
Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	7.5 Proportion of total water resources used 7.6 Proportion of terrestrial and marine areas protected 7.7 Proportion of species threatened with extinction
Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	7.8 Proportion of population using an improved drinking water source 7.9 Proportion of population using an improved sanitation facility
Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers	7.10 Proportion of urban population living in slums
Goal 8: Develop a global partnership for development	
Target 8.A: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system Includes a commitment to good governance, development and poverty reduction – both nationally and internationally	*Some of the indicators listed below are monitored separately for the least developed countries (LDCs), Africa, landlocked developing countries and small island developing States.* <u>Official development assistance (ODA)</u>
Target 8.B: Address the special needs of the least developed countries Includes: tariff and quota free access for the least developed countries' exports; enhanced programme of debt relief for heavily indebted poor countries (HIPC) and cancellation of official bilateral debt; and more generous ODA for countries committed to poverty reduction	8.1 Net ODA, total and to the least developed countries, as percentage of OECD/DAC donors' gross national income 8.2 Proportion of total bilateral, sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation) 8.3 Proportion of bilateral official development assistance of OECD/DAC donors that is untied
Target 8.C: Address the special needs of landlocked developing countries and small island developing States	8.4 ODA received in landlocked developing countries as a proportion of their gross national incomes 8.5 ODA received in small island developing States as a

(through the Programme of Action for the Sustainable Development of Small Island Developing States and the outcome of the twenty-second special session of the General Assembly) Target 8.D: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term	proportion of their gross national incomes <u>Market access</u> 8.6 Proportion of total developed country imports (by value and excluding arms) from developing countries and least developed countries, admitted free of duty 8.7 Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries 8.8 Agricultural support estimate for OECD countries as a percentage of their gross domestic product 8.9 Proportion of ODA provided to help build trade capacity <u>Debt sustainability</u> 8.10 Total number of countries that have reached their HIPC decision points and number that have reached their HIPC completion points (cumulative) 8.11 Debt relief committed under HIPC and MDRI Initiatives 8.12 Debt service as a percentage of exports of goods and services
Target 8.E: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries	8.13 Proportion of population with access to affordable essential drugs on a sustainable basis
Target 8.F: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications	8.14 Telephone lines per 100 population 8.15 Cellular subscribers per 100 population 8.16 Internet users per 100 population

From The official United Nations site for the MDGs indicators. Retrieved February 18, 2010 from http://unstats.un.org/unsd/mdg/Host.aspx?Content=Indicators/OfficialList.htm

Table 6: Current Indicators found in Disaster Response & Recovery Progress Reports

SECTOR	INDICATORS IN REPORTS
Education	• Number of schools built or reconstructed • Number of children served/accommodated • Number of training centres built • Number of libraries built • Number of schools receiving educational supplies
Environment	• Areas cleared of debris • Number of docks repaired • Areas cleared of sand (rice paddies) • Amount of coastline area evacuated
Food	• Number of children receiving nutrition supplements • Number of children whose growth is being monitored • Number of people fed • Amount of food sent/distributed • Number of schools served (school feeding program) • Number of Food-for-Work participants • Amount of cash allowances distributed
Health	• Number of public health workers trained • Number of hygiene kits distributed • Number of flip-flops distributed (prevent worms) • Number of children served by nutritional program • Number of hospitals receiving medical equipment • Number of children/families counselled • Number of children vaccinated • Number of mosquito-nets distributed • Amount of drugs/contraceptives distributed • Number of psychosocial sessions conducted
Infrastructure	• Number of community centres built • Number of families relocated • Number (kilometres) of roads repaired • Number of community contracts issued • Number of water supply projects
Livelihoods	• Number of fishing boats repaired or reconstructed • Number of businesses established • Number of banks established • Number of palm trees planted • Number of loans given • Number of fish ponds created & stocked • Number of sewing machines distributed

Shelter	• Number of tents distributed • Number of temporary houses constructed/provided • Number of permanent houses constructed • Number of houses repaired • Amount of land acquired
Water and Sanitation	• Number of wells repaired or built • Number of ponds & irrigation canals • Number of latrines constructed • Number of rain water harvesting tanks built • Number of people trained on harvesting tanks • Number of people with access to safe water • Number of schools with water & sanitation facilities • Number of children receiving hygiene education

Appendix 3: Figures

Figure 9: Sample Logic Model for Tsunami Disaster Response in Sri Lanka

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS
▪ Financial resources ▪ Educational supplies ▪ Reconstruction supplies e.g. timber, roofing ▪ Donated work-related supplies e.g. boats, sewing machines etc. ▪ Local Community ▪ Sri Lanka Institute for Local Governance (SLILG) ▪ Volunteers ▪ Local CBOs & NGOs ▪ Provincial Councils & State Agencies ▪ Ministry of Labor Relations & Manpower ▪ Ministry of Finance & Planning ▪ Ministry of Samurdhi & Poverty Alleviation ▪ Ministry of Tourism ▪ Ministry of Trade, Marketing Development, Co-operatives & Consumer	▪ Clear debris ▪ Clear sand from rice paddies ▪ Acquire land for vocational training centers, industries, farms & business offices ▪ Build/renovate vocational training centers ▪ Conduct training sessions for local career trainers ▪ Identify crops replacements for desalinated farms ▪ Repair/construct fishery harbors, anchorages and other fishing related infrastructure ▪ Rebuild damaged hotels and other	▪ X amount of land acquired/cleared ▪ B coastline area cleared ▪ C amount of rice paddies cleared of sand ▪ D number of vocational training centers built ▪ E alternative crops identified ▪ F amount of seeds distributed ▪ G number of fishing infrastructures repaired ▪ H number of opportunities identified (gender appropriate/sensitive) ▪ J number of new occupations identified and developed	▪ Increase in local employment opportunities especially for women ▪ Reduction in migration for economic reasons ▪ Increase in agricultural productivity ▪ Increase in food variety ▪ Improved food security ▪ Reduction in the prevalence of underweight children under-five years of age ▪ Reduction in the proportion of population below minimum level of	▪ Reduction in the proportion of population below $1 purchasing power parity (PPP) per day ▪ Reduction in the gap ratio ▪ Reduction of the share of the poorest quintile in national consumption ▪ Increased growth rate of GDP per person employed ▪ Increased employment-to-population ratio ▪ Increased gender equity ▪ Reduction in child mortality rate

Services ▪ Ministry of Agriculture, Livestock, Land & Irrigation ▪ Ministry of Agricultural Development & Agrarian Services ▪ Ministry of Youth Empowerment & Social Economic Development ▪ Ministry of Supplementary Plantation Crops Development ▪ Ministry of Fisheries & Aquatic Resources ▪ Ministry of Education ▪ Ministry of Higher Education ▪ Ministry of Vocational & Technical Training ▪ Ministry of Enterprise Development & Investment Promotion ▪ Ministry of Industrial Development ▪ Ceylon Fisheries/Harbour Corporation ▪ Jobsnet Chamber of Commerce ▪ International Labor Organization ▪ International Organization for Migration	tourism areas ▪ Rebuild civic infrastructure ▪ Assess income generating opportunities in the community ▪ Train community members on skills required to take advantage of income opportunities ▪ Partner with private companies in creating employment in local community ▪ Promoting diverse economic sectors (as applicable) ▪ Promote creation of gender sensitive employment opportunities ▪ Evaluate environmentally friendliness of livelihood alternatives ▪ Mobilize for environmentally friendly policies ▪ Organize lobbying for provision for adequate	▪ K number of occupation relevant equipment distributed ▪ L number of trainers trained ▪ M number of training sessions conducted ▪ N number of locals trained ▪ O number of public-private partnerships established ▪ P number of community members employed (gender aggregated) ▪ Q number of trade agreements ▪ R number of reduced tariffs negotiations approved	dietary energy consumption ▪ Reduction in the proportion of employed people living below $1 (PPP) per day ▪ Increase in the share of employed women ▪ Increase in the proportion of land area covered by forest ▪ Maintenance of proportion of fish stocks within safe biological limits ▪ Increased proportion of protected terrestrial and marine areas ▪ Presence of environmental policies and programs ▪ Increased access to the international market ▪ Increase in GDP	▪ Increased biodiversity ▪ Zero/surplus balance of payments (BOP)

▪ Food & Agriculture Organization ▪ UNDP ▪ UN Environment Programme ▪ CCF (ChildFund) ▪ World Food Programme ▪ UNICEF ▪ ADB ▪ International Monetary Fund ▪ World Vision International ▪ OXFAM ▪ Women's groups ▪ Livelihood development experts ▪ Community spaces ▪ Private companies ▪ Universities	living wages ▪ Link with schools to allow for flex-time around school hours ▪ Develop trade agreements with other countries			

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