Master thesis

Managing natural disasters, sustaining local development

A problem handled through local community - private organization collaboration? A case study from the Dominican Republic

Kim Øvland

Master of Science Development Management

The master thesis is carried out as a part of the education at the University of Agder and is therefore approved as such. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

Supervisor:

Prof. Arne Olav Øyhus

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Abstract

The UN's Intergovernmental Panel on Climate Change (IPCC) forecasts a future increase of natural disasters and the work to reduce the impacts of such disasters must be escalated. Therefore it seems very important that organisations located in disaster ridden areas, such as the Caribbean, are involved in helping those who are affected by natural disasters. Usually those most affected are the poor and socially disadvantaged groups, meaning support of these peoples are vital for local development. In this thesis proposal I try to link the themes of disaster management and sustainable development, and look at the possibility for private organisations to collaborate with local communities' in their effort to reduce the impacts of future disasters. In this effort vulnerability is a key concept which needs to be addressed, as well as the local communities' openness to external organisations.

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Abbreviations

ADMD	-	Asociación Dominicana de Mitigación de Desastres
BAP	-	Bali Action Plan
BCPR	-	Bureau for Crisis Prevention and Recovery (UN)
CB	-	Central bank of Dominican Republic
CGCED	-	Caribbean Group for Cooperation in Economic Development
CICERO	-	Centre for International Climate and Environmental Research – Oslo
COP	-	Conference of the Parties
CRED	-	Center for Research on the Epidemiology of Disasters
DC	-	Defensa Civil (Civil Defence in DR)
DFID		Department for International Development (UK)
DHA	-	Department of Humanitarian Affairs (UN)
DM	-	Disaster Management
DR	-	Dominican Republic
DRC	-	Dominican Red Cross
DRR	-	Disaster Risk Reduction
EM-DAT	-	Emergency Events Database
EWS	-	Early Warning Systems
FIC	-	Feinstein International Center
GPDRR	-	Global Platform for Disaster Risk Reduction
HFA	-	Hyogo Framework for Action
HIPC	-	Heavily Indebted Poor Countries
IADB	-	Inter-American Development Bank
IDNDR	-	International Decade for Natural Disaster Reduction (1990-1999)
IFRC	-	International Federation of Red Cross
IMF	-	International Monetary Fund
IPCC	-	Intergovernmental Panel on Climate Change
ISDR	-	International Strategy for Disaster Reduction (UN)
MDGs	-	Millennium Development Goals
NCAR	-	National Center for Atmospheric Research
NDO	-	national disaster office
NGO	-	non-governmental organisation
OECS	-	Organisation of Eastern Caribbean States
OFDA	-	Office of U.S. Foreign Disaster Assistance
PNUD	-	Programa de las Naciones Unidas para el Desarollo (DR, eng: UNDP)
PLD	-	Partido de la Liberación Dominicana
PPD	-	Programa de Prevención y Preparación ante Desastres (DR)
PRD	-	Partido de la Revolución Dominicana
PRSP	-	Poverty Reduction Strategy Papers
SD	-	Sustainable development
SSRC	-	Social Science Research Council
TEC	-	Tsunami Evaluation Coalition
UCL	-	Université Catholique de Louvain (Belgium)
UiA	-	University of Agder (Norway)
UK	-	United Kingdom
UN	-	United Nations

UNDP	-	United Nations Development Program
UNEP	-	United Nations Environment Program
UNFCCC	-	United Nations Framework Convention on Climate Change
UNU	-	United Nations University
USA	-	United States of America
WB	-	World Bank
WCNDR	-	World Conference on Natural Disaster Reduction
WDR	-	World Disasters Report
WHO	-	World Health Organization

Chapter 1 Introduction

1.1 Background and rationale

235,000 people killed
+
250,000,000 people affected
=
Effects of natural disasters in 2008

Source: FIC, 2009

"Disaster loss is on the rise with grave consequences for the survival, dignity and livelihood of individuals, particularly the poor and hard-won development gains."

Source: UN/ISDR, 2005, "Hyogo Framework for Action"

In 2008 about 1 of every 27 people on earth became victims of natural disasters (FIC, 2009; PRB, 2008). In the peak year of 2002 almost 1 of ever 9 were affected (Scheuren et al., 2008; PRB, 2008). In 2007 more than 84 % of those affected were affected by water related disasters, such as floods and heavy rains (Scheuren et al., 2008).

Disaster issues, what contributes to them and how to reduce their impacts are increasingly of global concern, as disasters often have international roots but are most damaging at the local level. Local poor communities are most affected, mainly for two reasons; most poor or developing countries are located in hazard prone areas, and poor societies are usually the most vulnerable. "Increasing vulnerabilities related to changing demographic, technological and socio-economic conditions, unplanned urbanization, development within high-risk zones, under-development, environmental degradation, climate variability, climate change, geological hazards, competition for scarce resources, and the impact of epidemics such as HIV/AIDS, points to a future where disasters could increasingly threaten the world's economy, and its population and the sustainable development of developing countries". (UN/ISDR, 2005).

The Hyogo Framework for Action (HFA) has identified specific gaps and challenges related to disaster reduction in five main areas:

1. Governance: organizational, legal and policy frameworks;
2. Risk identification, assessment, monitoring and early warning;
3. Knowledge management and education;
4. Reducing underlying risk factors;
5. Preparedness for effective response and recovery.

Source: UN/ISDR, 2005

In the late 1980s the acknowledge disaster scholar Dr. Enrico L. Quarantelli stated that amongst the many actors working with topics related to disasters there was little consensus regarding disaster issues (1987). Almost 20 years later another acknowledged disaster scholar David Alexander suggests that the international community's attitude to disasters needs to be provoked in order to put greater emphasis on risk reduction rather than just being reactive towards natural disasters. This implies that there still doesn't exist a truly holistic perspective on disaster management (2006:17).

According to the UN it is important that disaster risk reduction is integrated into development activities, as disasters associated with natural hazards are fundamentally an issue of development. How failed or unsustainable development planning and investments contribute to development is made evident after each natural disaster (CGCED, 2002*a*), and the reasons for connecting disaster management and sustainable development thinking becomes clear.

Due to the destructions by natural disasters around the world there is increased recognition amongst international moneylenders and humanitarian organisations, as well as nation states that risk reduction and disaster management must be focused on as conditions are probably gone get worse (UN/ISDR, 2007*b*). According to the UN's Intergovernmental Panel on Climate Change (IPCC) forecasts a future increase of natural disasters and the work to reduce the impacts of such disasters must be escalated. The WHOs director general Dr. Lee Jong-Wook claims it is necessary to do more than what is currently being done to "strengthen national capabilities in disaster preparedness and response and in reducing the overall impact of future disasters, at the same time as seeking improvements in the international assistance system" (WHO, 2008). From a western point of view it is the government which has the most effective and important resources and capability to prevent, act and respond when disasters hit, but for governments in developing countries the possibility or willingness to do so is often not present.

No matter what the right actions towards natural disasters are and how disasters are most effectively managed, the issues concerning disasters are important at all levels of society, hence researching disasters and their affects are important at al levels; international, national and local.

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1.3 Objectives of the study

To manage natural disasters is a crucial task if poor communities, which are more hazard prone tan most developed societies, are to develop sustainably. Disasters hinder and set back vital development gains, and to find ways of fighting this tragic reality is an important task and challenge. But who will take this challenge? Maybe private organizations can support local communities in their efforts to become better prepared and handle disasters, as many governments till date continuously fail to do so. I therefore explore the possibilities for how local community - private organization collaboration may create better management of natural disasters and thereby sustaining local development.

1.3.1 Sub-objectives

- How have disasters affected different local communities in the area surrounding Bonao, the Dominican Republic?
- Regarding disaster preparedness: What is the situation regarding community based emergency management systems in the area?
- Regarding disaster recovery: How has the people living in the 3 different communities; Palmarito, the shelters in Piedra Blanca and the new houses in Campo de Aviaciõn recoverd from disaster?
- What do the communities regard as the most important factors/means in order to reduce the effects of future disasters?
- Has private organisations assisted or supported the 3 communities in disaster preparedness and/or disaster recovery?
- How can cooperation, local community- private organization collaboration, better prepare these communities when facing future natural disasters?

1.4 Motivation for topic

After having studied different topics within the fields of economics, management and development for more than five years, my interests now evolve very much around how we can manage to develop new ways of handling new challenges. Global issues have become local issues and vice-versa, and therefore generating a *bigger picture* of what makes things happen in the world and how we can continue to develop given these circumstances is very interesting. Economic issues and development issues are intrinsically related and how to better manage the different aspects of this relationship is interesting challenging. At the same time environmental and natural considerations must be taken, as what we do affects our surroundings just as our surroundings presents events that affects us.

The concept of thinking more sustainably when people and organisations conduct there "business" has gained support, just as the number of threats to sustainable development has

increased. Natural hazards are major global concerns, and may affect you irrespective of your social position or level of development. How ever natural disasters occur far more often in the developing parts of the world, and affects the people living there that much harder. But that doesn't mean it's *their problem*. As I mentioned local concerns have become global concerns, and I believe reducing the devastating effects of natural disasters is everybody's concern, as we all contribute to the accelerating frequency of climate change driven natural disasters. The global community is linked together, and so are the topics of disaster management and sustainable development.

1.5 Organisation of the thesis

After this opening chapter follows **chapter 2**, which gives a short overview of the area where I conducted my fieldwork for this thesis. Then the literature which is relevant for the topic of disaster management in general and my thesis in particular is presented in **chapter 3**. In **chapter 4** the methodological issues related to my research is given a description, before I present my empirical findings and discuss them in **chapter 5**. Conclusions about the thesis are given in the final **chapter 6**.

Chapter 2 Research Area and Context

2.1 The Caribbean

Figure 2.1 Map of the Caribbean

Source: WorldAtlas.com, 2009

The Caribbean region has been victimized by natural hazards, soil erosion, overpopulation, gunboat diplomacy and experienced successive waves of colonization (Richardson, 1992). They share a history of "demographic transformation through labour migration, and economic dependency on activities that have utterly transformed their landscapes; plantation agriculture, mining, and tourism" (Baver, 2006:3). These three sectors, each with obvious environmental impacts; plantation agriculture, export-platform industrialization, and tourism have developed largely because of transnational capital invested by multinational corporations, as Caribbean development policies have often favoured such investments. However, even if the Caribbean is full of victims and historical challenges the people of the Caribbean have actively shaped their region, hence the region is actively a "part of the global economy's overall trajectory" (Richardson, 1992:3).

Together with Asia the Caribbean and Latin American region has the highest concentration of flooding and associated risks due to hurricanes, cyclones, tropical storms, typhoons, and monsoons, as well as landslides, earthquakes and droughts (UNDP/BCPR, 2008; Alca´ntara-Ayala, 2002). Natural disasters are a global issue, and the areas most prone to natural hazards are where most of the developing countries lie. As the frequency and intensity of natural disasters increase the countries in the Caribbean must divert money from development projects to relief and recovery demands, thus economic development suffers. Further more the recovery of economic growth after a disaster is slow recent experiences show in for instance the Dominican Republic and Jamaica (CGCED, 2002a). According to the Caribbean Group for Cooperation in Economic Development (CGCED) countries in the Caribbean region must take effective measures to manage the threat and impacts of natural disasters if they are to achieve sustainable development (2002a).

The natural-disaster rate in the Caribbean region has grown 5 percent annually over the last three decades, and since the change of the millennium several highly unusual extreme weather events have been reported, such as the Amazon drought of 2005, the destructive hail storms in Bolivia in 2002 and the record hurricane season of 2005 in the Caribbean Basin. Between 2000 and 2005 the reported economic losses were nearly US$20 billion in Latin America and the Caribbean. That is a lot especially since numbers on economic losses is just available for 19% of the events (Nagy et al., 2006, in IPCC, 2007:585). 2007 was also an especially devastating year for the Caribbean countries, when the number of hydro-meteorological disasters (see **Box 3.1**, p.22) was especially high and the number of tropical cyclones was almost double the 2000-2006 average (16 against 8.4) (Scheuren et al., 2008; UNDP/BCPR, 2008).

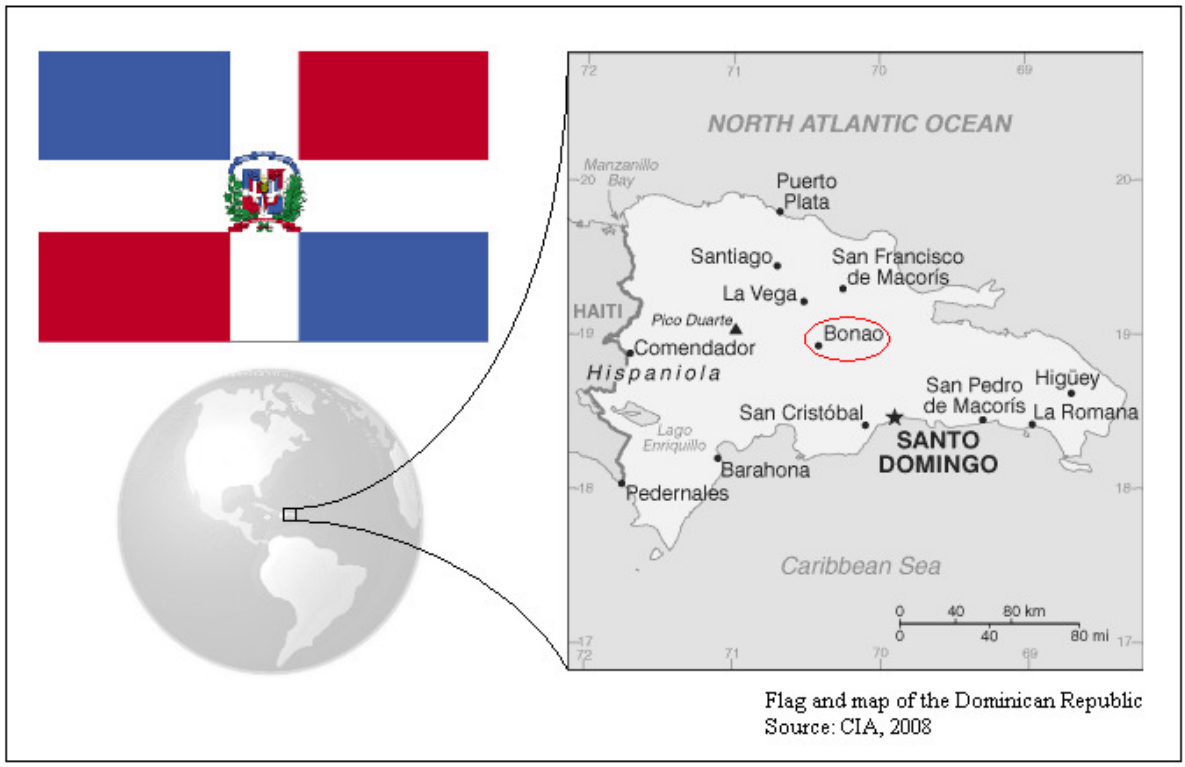
In their discussion draft *Natural Hazard Risk Management in the Caribbean: Revisiting The Challenge* (2002a) the CGCED found that there was considerable experience with risk management in the Caribbean region, but that the knowledge derived from these experiences were not well developed, shared or incorporated into overall development decisions in either the public or private sector. The main reasons for this were:

1. a continued perception that risk management is the sole province of government agencies responsible for disaster management rather than a shared responsibility involving sector ministries, trade associations, and the private sector;
2. low public demand for risk management measures due to complacency, a lack of understanding of the risks involved, and the perceived cost of these measures;
3. a lack of dissemination and public education with respect to the potential benefits and successful experiences with hazard risk management;
4. a lack of effective coordination between governments, regional, and international financing agencies in developing a framework for hazard risk management;
5. collective absence of political will across governments, private sector institutions, and international financing agencies in enforcing existing standards; and

Source: CGCED, 2002a:IV

2.2 The Dominican Republic

Figure 2.2 Flag and map of the Dominican Republic



Flag and map of the Dominican Republic
Source: CIA, 2008

2.2.1 Facts

Table 2.1 Facts about DR	
Official name	República Dominicana
Head of state	President Leonel Fernández Reyana (PLD) (sworn in16 Aug 2004)
Head of government	President Leonel Fernández Reyana
Ruling party	Partido Revolucionario Dominicano (PRD) (Dominican Revolutionary Party)
Capitol	Santo Domingo
Population	9 507 133 (July 2008 est.)
Area	48,730 sq km Unrelated comparison: • Norway: 323,802 sq km
Ethnic groups	mixed 73 %, white 16 %, black 11 %
Religion	Roman Catholic 95 %, other 5 %
Language	Spanish
Literacy (definition: age 15 and over can read and write)	total population: 87%
GDP	$85.4 billion (2007 est.)
GDP per capita	$9,200 (2007 est.)

	Unrelated comparison: • Norway: $55,600 (2007 est.)
Labour force	3.986 million (2007 est.)
Unemployment	15.5 % (2007 est.)
Inflation	5.8 % (2007 est.) Comparison: 51.5 % in 2004
About half of Dominicans live in rural areas and it is estimated that more than half of the population is living under the poverty line set by the UN, and that 25 % live in extreme poverty. Source: CIA, 2008; UD, 2007. Table: Kim Øvland	

2.2.2 History

Hispaniola was called Quisqueya by the indigenous people, before is was "discovered" by Columbus in 1492 and renamed Hispaniola, and claimed for Spain. Within 3 decades of Columbus arrival nearly all the indigenous people where killed (Richardson, 1992). In 1697 the western 3rd part of the island was conquered by French buccaneers, and became the French St.Domingue, while the rest of the island stayed under the Spanish rule seated in Santo Domingo. During the next century of French rule of western Hispaniola tens of thousands of West African slaves where brought to the St.Domingue, and finally in 1804 the slaves rebelled and established the independent republic of Haiti.

In 1822 the president of Haiti, Jean-Pierre Boyer, decided to invade Santo Domingo and reunite the island under the Haitian flag. The island remained united for 22 years before Dominican rebel forces took Santo Domingo on July 12, 1844, and they proclaimed General Pedro Santana Familias ruler of the Dominican Republic (Haggerty, 1989). Once again the island was divided as it is today between Haiti and the Dominican republic, though the exact borderline wasn't drawn until 1929. The liberation of the Dominican Republic in 1844 came later than that of most Latin American countries.

The political history of the Dominican Republic has been defined by an almost continuous competition for supremacy among political-military leaders of authoritarian ideological convictions (*caudillos*). In the late 1980s, the republic was still struggling to emerge from the shadow of the ultimate Dominican caudillo, Rafael Leónidas Trujillo Molina (1930-61), who emerged from the military and held nearly absolute power throughout his rule. The apparent establishment of a democratic process in 1978 was a promising development; however, the survival of democracy appeared to be closely linked to the country's economic fortunes, which had declined steadily since the mid-1970s. As it had throughout its history, the republic continued to struggle with the nature of its domestic politics and with the definition of its economic and political role in the wider world (Haggerty, 1989). But that has since been changing and the region of the Caribbean is becoming an active part of the global economy (Richardson, 1992).

2.2.3 Politics

Following independence from Haiti in 1844, the Dominican Republic was characterized by political instability for almost a century. Dictator Rafael Leonidas Trujillo Molina took power in 1930 and ruled in repressive authoritarian fashion until his assassination in 1961. Brief civil war broke out in 1965 between liberal Constitutionalists and conservative Loyalist military fractions. A larger conflict was aborted by direct military intervention by United States (Haggerty, 1989). Up until 1996 the presidency was held either by the Trujillo protégé Balaguer or the Dominican Revolutionary Party (PRD), when Leonel Fernández and the Dominican Liberation Party (PLD) came into power. Minus one term (2000-2004) when the center-left Hipólito Mejía was president, Leonel Fernández has been president since, winning the last election in 2008 (Infoplease, 2008).

The Dominican Republic is a representative democracy with national powers divided among independent executive, legislative, and judicial branches. The president appoints the cabinet, executes laws passed by the legislative branch, and is commander in chief of the armed forces. The president and vice president run for office on the same ticket and are elected by direct vote for 4-year terms. Legislative power is exercised by a bicameral Congress - the Senate (32 members) and the House of Representatives (178 members) (US Dep. of State, 2007).

2.2.4 Economy

After a decade of little to no growth in the 1980s, the Dominican Republic's economy boomed in the 1990s. Tourism, telecommunications, and free-trade-zone manufacturing are the most important sectors, although agriculture is still a major part of the economy. The Dominican Republic owed much of its economic progress to the adoption of sound macroeconomic policies in the early 1990s and greater opening to foreign investment (US Dep. of State, 2007). The Dominican Republic has long been viewed primarily as an exporter of sugar, coffee, and tobacco, in recent years the service sector has overtaken agriculture as the economy's largest employer due to growth in tourism and free trade zones. The Dominican enjoyed strong GDP growth until it turned negative in 2003 with reduced tourism, a major bank fraud, and limited growth in the US economy (the source of about 80% of export revenues), but recovered in 2004 and 2005 (CIA, 2008). Growing domestic consumption and an expansion of the export sector contributed to the revival (WI, 2008). Further through strict fiscal targets agreed in the 2004 and renegotiation of an IMF standby loan, President Fernandez stabilized the country's financial situation lowering inflation to less than 6%. In 2008 however inflation rates grew to over 11%. High food prices, driven by the effects of consecutive tropical storms on agricultural products were significant contributors to the jump. Since 2005 the republic has enjoyed strong GDP growth though, with double digit growth in 2006, and with continued gains through mid-2008 (CIA, 2009).

The country suffers from marked income inequality; the poorest half of the population receives less than one-fifth of GNP, while the richest 10% enjoys nearly 40% of national income. The Dominican Republic's development prospects improved with the ratification of the Central America-Dominican Republic Free Trade Agreement (CAFTA-DR) came into force in March 2007 (CIA, 2009)

"Remittances from expatriate workers make an essential contribution to the economy, accounting for around 10 per cent of GDP. One and a half million Dominicans live abroad, mostly in the US but increasingly in Europe. The Inter-American Development Bank estimated that in 2006 migrant workers sent some US$2,900 million to their families in the Dominican Republic" (WI, 2008).

Despite a positive overall growth rate, sector-specific problems continue to exist, not least of all in the tourism industry, a vital component of the country's economy. The Dominican Republics reliance on imported oil, coupled with rising international crude prices is a definite worry and further steps at addressing this problem need to be taken and increased levels of foreign direct investment are imperative if the Dominican economic revival is to continue (Walden, 2006).

"The effects of the global financial crisis and the US recession are projected to negatively affect GDP growth in 2009, with a rebound expected in 2010" (CIA, 2009).

2.3 The Dominican Republic, disasters and disaster management

In 1982 Susan E. Jeffery presented a paper where she argued that the socioeconomic development such as the commercialisation of agricultural production in the Dominican Republic had increased human vulnerability by limiting certain groups of people's access to resources, and also increased the environmental vulnerability through the large scale agricultural production's long term ecological deterioration (1982:38). Such vulnerability increases due to economic development implied problems for the future she claimed, and hypothesised that the marginalised population of the Dominican would be vulnerable to future disasters. Poor populations with limited resources are vulnerable both pre-disaster; as they might have inadequate housing in high-risk areas, and post-disaster when they lack resources to recover (Jeffery, 1982). More than 20-years after Jeffery presented her paper it was stated that the situation in DR very much fits her description, as the country falls short in its ability to finance post-disaster reconstruction due to the high number of natural disasters effecting the country (Freeman et al., 2003). In areas affected by Hurricane Georges in 1998, infrastructural deficiencies were still prevailing 5 years later, especially in the rural areas that were affected (DRC, 2003).

Traditionally disaster management in the Caribbean has been limited to emergency response by government bodies such as the Civil Defence. This is still the case in some of the countries in the region (Freeman et al., 2003). In the DR however the occurrence of major disasters and the continued threat by natural hazards, has led to certain changes in their approach to coping with natural disasters (Freeman et al., 2003). This is important as high-risk countries need to increase their coping capacity to put in place effective measures to reduce risk, such as early warning systems, building codes or disaster sensitive local development plans (BCPR, 2009).

In the DR the Dominican Disaster Mitigation Association (ADMD) has since 1995 held Community Disaster Preparedness Workshops in 874 high risk communities (ADMD, n.d.). As a result of this many communities have established disaster mitigation committees and other neighbourhood associations. However 874 communities is a minority of the high risk communities in DR, meaning the large majority has not received orientation, assistance or equipment in relations to disaster management (CGCED, 2002*b*:74). Further more in the DR

such "community-based efforts are often short-term pilot projects, which do not provide long term follow-up necessary for lasting impact on vulnerability reduction" (CGCED, 2002*b*:67).

2.3.1 DR disaster statistics

Table 2.2 Disaster statistics: 1978-2008 vs. 2004-2008

Annual/total numbers	Period	
	1978 -2008	**2004-2008**
Annual average no. of people affected	136,290	41,295
Annual average no. of disasters	1,5	3
Annual average costs (US$)	89,017,000 (25,934,433 if we excl. 1998/Huricane Georges (see **Table 2.4**))	91,940,000
Total no. of people affected	4,224,991	206,476
Total no. of disasters	45*	15
Total costs (US$)	2,759,533,000	459,700,000

*Floods and storms count for 38 (84 %) of the disasters

Source: EM-DAT, 2009*a*. Table: Kim Øvland

Table 2.3 Disaster statistics: Major disasters

Single disaster with…	Disaster type	Date	No./amount
…highest no. of people killed	Flood	May 2004	688
…highest no. of people affected	Flood	August 1988	1,191,150
…highest econ. costs (US$)	Storm	September 1998*	1,981,500,000

*Hurricane Georges

Source: EM-DAT, 2009*a*. Table: Kim Øvland

2.3.2 DR and risk issues

The following is a table presentation of the status of important risk issues at different societal levels in the DR. The source used for this presentation is from 2002 (CGCED, 2002*b)*, but based on my experience, research and knowledge concerning DM issues in the DR, the status hasn't changed very much. Further more the information presented gives an important glimpse of "how the system works" in the Caribbean country.

Table 2.4 Resent status of DR risk identification/reduction/transfer

	Level	Risk identification	Risk reduction	Risk Transfer
---- Local ----	**Local government**	Hazard maps and critical facility information is not available, or not at useful scale for local government. Environmental controls often do not reflect awareness of natural and other hazards. Development projects rarely designed to accommodate hazards.	Much public infrastructure is located in hazardous areas. Building codes are rarely enforced. There are no local recovery plans in place. And building and facility failures are not studied after a disaster.	-
	Local disaster committees	In some places active disaster committees have made evacuation plans for high-risk areas.	A minority of the communities have disaster committees, with limited training and resources.	-
	Civil society	Community-based efforts are short-term pilot projects, which do not provide long term follow-up necessary for lasting impact on vulnerability reduction. Socio-economic hazards are considered bigger problems than natural hazards.	Mitigation measures are narrowly designed. Dense informal housing in hazardous areas. Little attention is paid to local peoples concerns regarding new constructions. No general standards or controls are in place for post-disaster measures.	Organisations and churches with international headquarters receive resources from abroad. Few residential or commercial properties are insured. Insurances are not required or promoted, e.g. when loans are obtained.

---------- National ----------	**Central government**	The lack of political commitment and resources impedes the development and implementation of a disaster action plan. Vulnerability information is not available for most of the country. Natural hazards are generally not included in project appraisals.	Many significant deficiencies in energy, transportation, health, education, water and other key sectors Little control of building processes and quality of building materials. 99 % of new constructions are commenced before design is approved by government officials. And only 30 % obtain a building permit. Natural systems are degraded by failed agricultural and forestry practices. Few recover plans exist.	Little reserves for disaster funding. The government has no incentives for private catastrophe reserves. DR has problems complying with IADB and WB requirements. Public assets are generally not insured. No public funding mechanisms to indemnify the poor.
	National disaster office	Adequate maps of rain hazards exist. DC has identified highly vulnerable groups, and seeks to implement plans to reduce vulnerability in these locations.	DC proposes to play a key role in the authorization of new constructions, but has not been given resources or authority to do so. DC relies on donations for technical assistance. Rehabilitation is donor driven.	DC does not promote risk reduction for insurability purposes.
	Private sector	Laws aimed at the private sector related to environmental concerns, building permits and operating licences are rarely enforced. Some companies support DC and other national disaster activities	Some companies provide training in safety for its employees. Many companies import and implement e.g. international safety standards and building materials.	Generally companies do not maintain savings for self-insurance purposes. A minor part of private companies have business interruption insurances.

Source: CGCED, 2002*b*. Table: Kim Øvland

2.4 The local research area

As I intend to study the affects and possible actions which may reduce the affects of natural disasters I had to conduct my research in an area frequented by natural disasters and I also viewed it as sensible to focus my research in an area where the population is more or less constantly facing the risk of natural disasters occurring and affecting their lives. This means that natural disasters are "a part of life" and the people that are part of my research will have both knowledge and experience regarding issues related to communities affected by and facing natural disasters.

The Xstrata Nickel company has operations in Bonao, the Dominican Republic, and an agreement with the University of Agder to send students to their location in the DR. Here they can intern or work with Fundación Falcondo, a foundation which the company financially supports. For me to take advantage of this agreement was an easy and sensible choice, as the Bonao area suited my research topic and interests.

In the area surrounding Bonao there are several small and relatively poor communities, located in high-risk areas e.g. close to rivers which typically overflow during hurricanes and heavy rainfall. Further more infrastructure in these communities are often of lower quality and the houses range from shed-like buildings constructed of corrugated plates and wooden boards to concrete and sturdy buildings. The economic situations in these areas are though and business and work is located around small-scale enterprises such as colmados, bakeries (panaderias) or motorcycle taxi-driving (moto-conchos), at the same time unemployment rates are high.

Box 2.1 Colmado

A *colmado* is a combination of a grocery store selling everything from bread and milk, vegetables and fruit, to wine and spirits, to household articles and stockings. The size of a *colmado* may range from 4m² to a regular sized grocery store. The larger *colmados* also functions as "pubs", where most of what is sold is sold over the desk, and you can also sit at the desk and enjoy a beer.

Box 2.2 Moto concho

A *moto concho* is a motorcycle taxi, and the most active and present mode of transportation in the Bonao area. It is a cheap and relatively fast way to get around, and engages a rather large amount of people (mostly men) in work.

2.4.1 Bonao and surrounding area

Photo 2.1 "Fieldwork area in the Dominican Republic". Scale: 1:1000 (eye altitude ca. 14 km. Distances: Campo to Palmarito 3.7 km; Campo to Piedra 14 km; Piedra to Palmerito 13.5 km)
Source: GeoEye, 2009

My specific area of research is located in the central high lands in the centre of the Dominican Republic, in the provinces of Monseñor Nouel. This province features mountainous terrain and cooler temperatures. The city of Bonao is the capitol of Monseñor Nouel and lies 85 km north-east of the capitol Santo Domingo. Bonao ha approximately 80,000 inhabitants, and the province 175,000.

According to the local civil defence; Defensa Civil (DC), the ground water beneath Bonao is just 3-4 meters under the surface, meaning it doesn't take a lot of water before you get flooding. There is a high amount of rivers going through the area, and between 1200 and 1300 families live in close proximity to the largest river; Yuna (see **Picture 2.1**, the river coming in from the west, passing north of Bonao). Rio Yuna is the second longest river in the

Dominican Republic (138 km) and part of one of the three most important river systems in the country. Yaque del Norte and Yaque del Sur being the two other ones.

2.4.2 Palmarito (A)

Photo 2.2 “Palmarito” (eye altitude ca. 1 km, pointer: 18°56’08.89” N - 70°23’09.96” W)
Source: GeoEye, 2009

The community of Palmarito is located east of the highway running from Santo Domingo past Bonao and to the north coast. The community is close to the centre of Bonao. It consists of approximately 270 households (approx. 1350 people). Exact numbers were hard to obtain. In the community there exists a women’s group called “Club de Madres la Inmaculada” which serves the community and contributes to its vitality through different project establishments, e.g. micro credit schemes and a panaderia (bakery). There is little paved road in the community and the houses vary from fragile wooden constructions to concrete modern ones. East of the community there is a river which has overflowed at several occasions. Where the red arrow marks (**Photo 2.2**, **Photo 5.1** is from the same location) was a bridge which was destroyed by flooding during Hurricane Noel in October 2007. Yellow arrow points to the home of Senõra Ramona, who lost her house in Noel (see **Photo 5.4**)

2.4.3 Campo de Aviaciõn (B)

Photo 2.3 “Brisas del Yuna” (eye altitude ca. 1 km, pointer: 18°56’54.96” N – 70°25’06.57” W)
Source: GeoEye, 2009

Campo de Aviaciõn is a new settlement consisting of 21 houses, and approx. 26 families. These houses were set up by money provided by Xstrata Nickel in Bonao. The families who were given the houses had lost their homes in Noel, and came from different high risk communities surrounding Bonao. They stayed 11 months in shelters before they came to Campo. Brisas del Yuna (see **Photo 2.3** above) is one of these communities located just west of the centre of Bonao and close to Rio Yuna.

The new settlement of Campo de Aviaciõn lies on the open outskirts of Bonao (see **Photo 2.1**), on a former air-field, hence the name. The community has not yet gotten electricity, despite the fact that they have been living there for over 6 months. The road leading to the area is unpaved. The houses are simple but functional concrete constructions, dotted mainly on one single row (see **Photo 5.3**).

2.4.4 Piedra Blanca (C)

Photo 2.4 “Quinto Centenario” (eye altitude ca. 1 km, pointer: 18°50’35.39” N - 70°19’22.37” W)
Source: GeoEye, 2009

The small town of Piedra Blanca is located approx. 15 km south of Bonao on the highway towards Santo Domingo. The area consists of several small communities surrounding Piedra Blanca, just like around Bonao. The small community I used for my research is actually 32 (62 adults, 75 children) families living in 32 cubicles situated in a roofed basketball court, without side-walls, located next to a school. These families experienced the same devastating effects of Noel as the people now living in Campo de Aviaciõn, the difference I that the people living in Piedra Blanca are still living in shelters, 17 months after Noel. The people in the shelters come from different communities around Piedra Blanca, Quinto Centenario being one of them (see **Photo 2.4** above) which was very much affected by Hurricane Noel. On the road passing the baseball fields houses were destroyed and people killed. The river (running south-north in the western part of the photo) seems small enough in the picture, but when it flooded during Noel it reached all the way up to the school located west in the picture (red arrow), but here it only left material damages as the water level just raised 30-40 cm up on the wall. But material damage is a big problem for a school and a poor community, and therefore Fundación Falcondo has put up a concrete wall around the school to prevent material damage by future floods

The conditions in the shelters are quite bad. Each cubicle is made of plywood, approx 12m² in size and houses up to 7 people (?). Cockroaches are abundant, noise level is high and privacy is close to zero. Cooking facilities are very limited. The sanitation facilities are outside the shelter and far less than satisfactory, especially for women, girls and children, hence many do their private business in their cubicles. The toilets and showers are shed-like. Electricity is available from 6 pm till 10 pm. The shelter is located in a residential area, where people don’t appreciate the sheltered families’ presents that much.

Chapter 3 Literature Review and Theoretical Framework

3.1 Introduction

There is an abundance of literature and sources which provides interesting and important information regarding the field of disasters and disaster management. How to effectively address the issues of disaster management has been an evolving debate for decades, but even today there is still no universal consensus on what is the *right approach* to managing the complex challenges provided by disasters. In this chapter I will present a relevant selection of literature and contributions to the debate, and to my area of interest which revolves around disaster management and sustainable development, and the possibility for a local community and private organization synergy to unite these two issues. Achieving a unification of disaster management and sustainable development issues is of great importance in general and particularly for poor and developing communities, as natural disasters disproportionally affects disadvantaged groups, and presents a considerable hindrance to wanted development.

3.2 What is a disaster?

> *"The scale of a disaster's impact has much less to do with, say, an earthquake's Richter force or a hurricane's category strength than with the political economy of the country or region that it strikes."*
>
> Source: Jackson, 2006

First of all it is important to give an introduction to what a disaster is. Historically the perspective on disasters has changed regarding what *is* a disaster and what are the *reasons* for disasters. An early perspective, which still exists in some parts of the world, was that disasters were acts of God (Drabek, 1991, in McEntire, 2001:189), and that people were being punished for their wrongdoings. This supports the increasing recognition that 'natural disasters' is a convenience term (Alexander, 1997:289). A more scientific approach encompasses the natural processes of the environment and describes extreme natural and uncontrollable events as disasters when they affect a vulnerable group of people and disrupt all or some of the essential functions of the society (Wisner et al., 2004; Fritz, 1961, in Alca´ntara-Ayala, 2002:110). How ever the role of humans should not be downplayed, as human actions contribute in different ways to different catastrophic events (McEntire, 2001), or create social constructs liable to change, meaning disaster is mostly social in character (Alexander, 1997; 2005). This implies that disasters might be defined as super-natural, natural, technological or even social (Alexander, 2005; McEntire, 2001; Quarantelli, 1998*b*), as the causes of disasters range from drought to tsunami, from transportation accident to war (EM-DAT, 2009*b*; Scheuren et al, 2008; CRED, 2004; UN/ISDR, 2004*a*). For classification of disasters see **Box 3.1**.

To reach a minimum of agreement concerning what defines a disaster is important, if not to say necessary, so that actors working in fields related to disasters don't talk passed each other

when it comes to the characteristics, conditions and consequences of disasters (McEntire, 2001). This is important not only within the academic sphere, but also for the practitioners working in the field of disaster and disaster management, when trying to reduce the effects of disasters.

Disasters might be described as serious hazards or disruptions of community functions causing widespread losses which a community is unable to cope with and therefore needs external assistance (EM-DAT, 2009*b*; ISDR, 2004*a*; DHA, 1992), since a hazard by itself does not necessarily lead to a disaster, as the disaster really arises when a community is unable to cope with the hazard it faces (Basher, 2008:937). This means that disasters include three components (see Table 3.1); *hazard* (triggering agent) which is the source of the disruption, *vulnerability* which may be described as the inability to cope with a disruption, unless there coping elements present (*capacity*) (UN/ISDR, 2004*a*; Freeman et al., 2003; McEntire, 2001). This may sound simple enough, but make no mistake; the increasing interconnectedness of world economic and political systems, and the effects of climate change on natural processes has made disasters even more complex and destructive than ever before (FIC, 2009). How ever people and communities can do much to reduce the impacts and stress of extreme hazard events. Different preventive actions and preparedness initiatives can be taken at all the different levels of society, and through for instance fortified infrastructure, environmental maintenance, well functioning EWS and sufficient public knowledge of disasters it is possible to reduce the impacts of hazardous events. Such preventive actions are often referred to as *disaster risk reduction* (DRR) activities (Basher, 2008; UN/ISDR, 2004*a*). I'll come back to prevention later in the chapter.

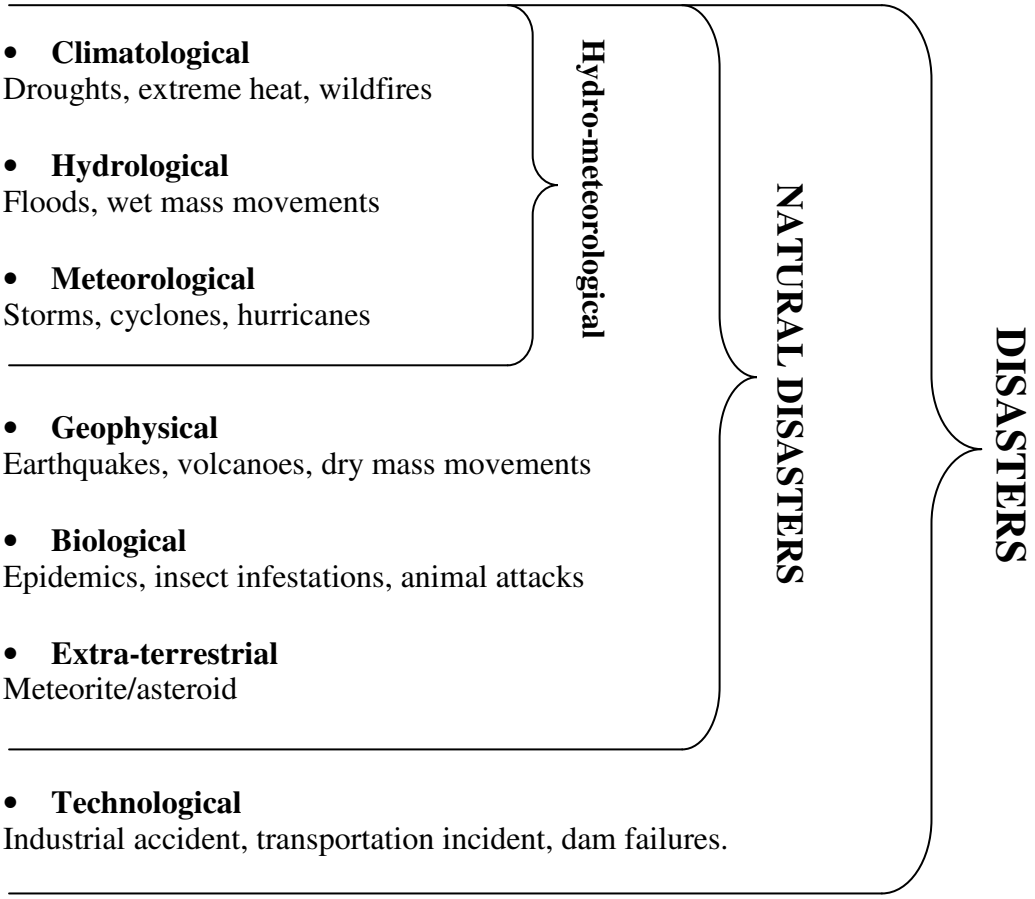
Table 3.1 Elements of a disaster

Hazard	**+ Vulnerability**	**- Capacity**	**= Disaster**
Potentially damaging physical event	*Susceptibility of exposed population and assets to loss*	*Possible effect-reducing strengths/resources within a society*	*Disruption exceeding community coping ability*

Source: UN/ISDR, 2004*a*; Freeman et al., 2003. Table: Kim Øvland

A very important characteristic and current description of the nature of disasters is that they are "complex interactions of the natural and human worlds" (Basher, 2008:938). These means understanding disasters involve knowledge from physical, ecological, social and cultural disciplines, and perspectives from the engineering, political and financial sphere. The major challenge here lies in linking these areas of knowledge and the different perspectives so that they can provide sensible answers and understanding of the nature of disasters, and at the same time link the existing but diverse range of methods and tools within disaster management and risk reduction. According to Basher we may expect to see the field of disaster studies become more structured and integrated, just as the field of environmental science has linked disparate areas of expertise over the last 40 years (2008:938).

Figure 3.1 Disaster classification



Source: EM-DAT, 2009*b*; Scheuren et al, 2008; CRED, 2004; UN/ISDR, 2004*a*. Figure: Kim Øvland

3.2.1 Hazard, risk or disaster?

The words hazard, risk, and disaster do have different meanings but are terms often used interchangeably (Cutter, 2001). A hazard is the broadest term and means a threat to people and the things they value. According to Cutter "hazards have a potentiality to them (they could happen), but they also include the actual impact of an event on people or places" (2001:2). Hazards have complex origins and are described as arising from an interaction between social and natural, as well as technological systems. Deforestation leading to increased runoff and subsequent flooding, may be described as a natural hazard, while a breaking levee might be described as a technologically induced hazard. At the same time there is a social element to the hazards of such flooding, as these hazards are partially products of society and societal actions (i.e. deforestation). Hence "it is impossible to understand hazards without also examining the context (social, political, historic, and environmental) within which hazards occur" (Cutter, 2001:3).

Risk is a component of hazard and refers to the probability or likelihood of an event or hazard occurring. Through estimation of the probability of a hazard happening one can determine

appropriate levels of safety or the acceptability of a technology or course of action (Cutter, 2001).

Disasters, like hazards, originate from different natural, social, technological and environmental sources, and may be described as a singular event that results in widespread losses to people, infrastructure, or the environment (Cutter, 2001).

"The distinction between hazard, risk, and disaster is important because it illustrates the diversity of perspectives on how we recognize and assess environmental threats (the risks), what we do about them (the hazards), and how we respond to them after they occur (the disasters)" (Cutter, 2001:3).

The theories and concepts of natural hazards have changed from acceptance and tolerance of hazards occurring, to managing and reducing loss from disasters. Within the newer perspectives of disaster the interactions among social and natural systems, and the built environment is emphasized, as is the notion that sustainability is threatened since unsustainable environmental practices increase vulnerability to hazards (Cutter, 2001:4).

3.2.2 Climate change and disasters

As stated earlier in the chapter climate change is leading to more extreme events which means that we in the future will face even greater challenges for DM and DRR than we do today (IPCC, 2007; UN/ISDR, 2007*c*). The threats presented by extreme events and hazards are escalating and effective adaptation and mitigation to these changes is essential. In the Bali Action Plan, the parties to the United Nations Framework Convention on Climate Change have identified disaster risk reduction strategies as a tool for adaptation (UNFCCC, 2007), and these tools should pay special attention to the poorest most vulnerable communities (UN/ISDR, 2007*c*).

The increase in extreme weather events is particularly evident for hydro-meteorological hazards and therefore it is crucial to strengthen capacities for reducing the impacts of e.g. floods and hurricanes. How ever it is important to remember that extreme events and disasters will occur irrespective of climate change, and that climate change is not a sole provider of hazards it simply makes the problems and threats related to natural disasters worse (Basher, 2008:939), just as human vulnerability will exist irrespective of climate change, but the climate, and its daily projection as weather, provides the hazards that act upon our vulnerability (FIC, 2009:5). Reducing vulnerability to near-term climate hazards is an effective strategy for reducing long- term risks to the effects of climate change (CGCED, 2002*a*)

In their report "The Humanitarian Costs of Climate Change" the scientist at the Feinstein International Center conclude that climate change will lead to more frequent and intense extreme weather and natural disasters, but that it is impossible to say *how* frequent and *how* intense. Therefore investments in disaster mitigation efforts must be done based on incomplete date and information, and donors should provide funds for preventive measures even if they feel they don't have enough information. Because when it comes to predicting the weather we will never have good enough information (Bjergene, 2009).

In March 2009 1600 scientist came together at the conference "Climate change – Global Risks, Challenges and Decisions" in Copenhagen and one of their messages for political concern was that extreme weather events will occur more often and with higher intensity when average global temperatures increase (Pileberg, 2009). And the link between climate change and global temperature increase is now evident, in fact climate change and global warming are now greater contributors to hurricane activity than natural temperature cycles (NCAR, 2006).

3.2.3 The important concept of vulnerability

Westgate and O'Keefe (1976, in Jeffery, 1982:38) were among the first to recognize the importance of vulnerability by defining disaster as "the interaction between extreme physical or natural phenomena and a vulnerable human group". Vulnerability may be described as the conditions which increase the susceptibility of a community to the impact of hazards. These vulnerable conditions are determined by physical, social, economic and environmental factors (UN/ISDR, 2004*a*)

Many actors within the field of disasters divide vulnerability into different categories in different ways. Cannon (1993) for instance has divided vulnerability into three parts; (1) *livelihood resilience*; an individual's or group's the degree of resilience and its hazard resisting capacity, (2) *health*; including the strength and functioning of individuals and social entities, and (3) *preparedness*; determined by actual preparations and protection available for a given hazard, within a society. These are three vulnerability aspects which others would specify further in order to shed more light on the threats vulnerable human groups are facing. A greater specification has the possibility to create greater understanding of the total human and societal vulnerability to disasters, which is important in order to establish effective prevention measures. Aysan (1993, in Alca´ntara-Ayala, 2002:118) describes more specific kinds of vulnerability:

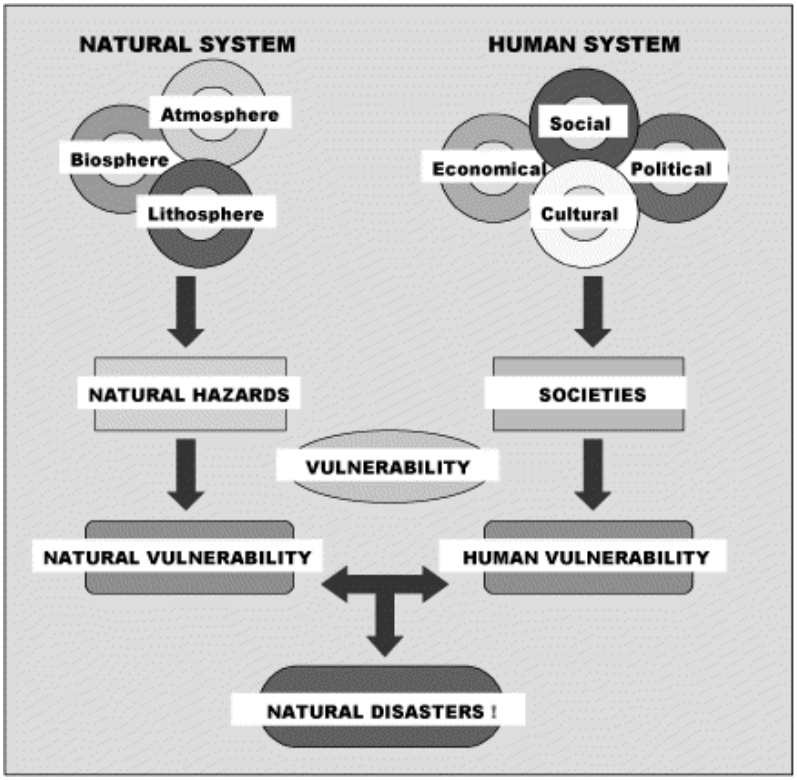
- Lack of access to resources (materials/economic vulnerability)
- Disintegration of social patterns (social vulnerability)
- Lack of strong national and local institutional structures (organizational vulnerability)
- Lack of access to information and knowledge (educational vulnerability)
- Lack of public awareness (attitudinal and motivational vulnerability)
- Limited access to political power and representation (political vulnerability)
- Certain beliefs and customs (cultural vulnerability)
- Weak buildings of weak individuals (physical vulnerability)

Source: Aysan, 1993, in Alca´ntara-Ayala, 2002:118

When presenting vulnerability like Aysan does, it becomes evident that vulnerability issues are issues often related to poverty and disadvantaged people and communities. This relates to the fact that destruction typically has a disproportionate impact on the poorest and most vulnerable populations (UNDP/BCPR, 2009; CRED, 2004). How ever vulnerability is not a general term which should automatically be linked to poverty. The degree of vulnerability in a society is a product of human action, decisions and choices as well as the context and place specific interaction of natural, economic, social, cultural and political factors. It is a heterogeneous and dynamic term which maybe be described as a product of "the coupling between the natural and human systems" (see **Figure 3.3**) (Alca´ntara-Ayala, 2002:118).

When looking at **Figure 3.3** the creation of vulnerability is divided between the natural system and the human system. Natural vulnerability very much relates to geographical location and depends on physical threats such as natural hazards, and environmental issues. While human vulnerability is based on the social and economical factors, as well as existing political and cultural systems (Alca´ntara-Ayala, 2002:118).

Figure 3.2 Creation of vulnerability



Source: Alca´ntara-Ayala, 2002:120

Certainly vulnerability can be described in different ways as several factors influence the vulnerability of a population. How ever a classification into the following four broad groups seems sensible:

- **Physical aspects of vulnerability** are linked to the exposure of the population to a potential hazard. This can mean living in harm's way, such as in a flood plain or in a seismically active area.

- **Social vulnerability** includes aspects such as population growth, the existence of conflicts and insecurity, ethnic, sexual or aged-based discrimination access to social safety nets, or the capacity of a population to cope with disasters – a factor usually referred to as its resiliency.

- **Economic vulnerability** is linked to the population's or country's dependence on agriculture, the diversification of its economy, the availability of insurance or loans, its financial assets or debts, as well as its access to basic infrastructure such as water, electricity, communication networks and health care.

- **Environmental vulnerability** includes such factors as soil degradation and erosion, deforestation, chemical or biological pollution and the availability of water, whether for drinking, irrigation or other uses.

Source: CRED, 2004:34-35

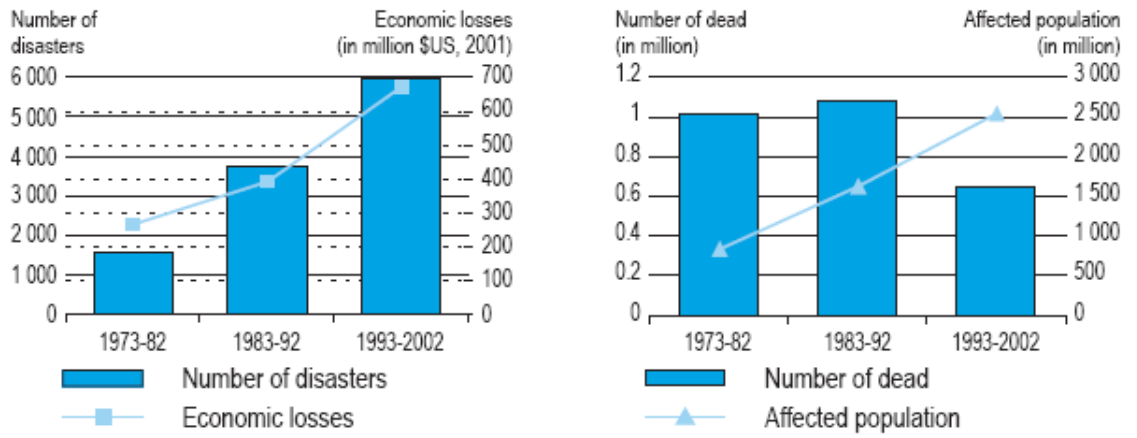
3.2.4 Some disaster statistics

If we look at the 15-year period from 1991-2005 960,000 people were killed, 3.5 billion people were affected and the combined economic losses were close $ 1,200 billion USD. This includes all types of natural disasters (see **Box 3.2**) and only in the last decade, 86% of all disaster-related deaths were caused by natural disasters, with just 14% resulting from technological disasters such as transport or industrial accidents. The vast majority of the natural are weather or climate related (hydro-meteorological), mainly tropical cyclones, windstorms, floods and droughts (EM-DAT, 2009*b*). The trend for such hydro-meteorological disasters is rising and the reported annual number has actually close to doubled over the last 20 years. If we consider floods 2,156 were reported in EM-DAT the last 30 years, resulting in the deaths of 206,303 people and affecting more than 2.6 billion. "The affected to dead ratio was on average 13,027 people affected for one person killed, many times more than for any other type of disaster" (CRED, 2004:32). Floods can cause extensive damage to infrastructure and crops, they may develop slowly or occur suddenly, and the damage they cause is often pervasive and long term (CRED, 2004)

The destructions caused by geophysical events such as earthquakes and tsunamis are less common but considerable, such as the 2004 Indian Ocean tsunami which killed approximately 226,000 and the 2008 earthquake in China which killed 87,476 people.

Considering the period from 1973-2002 there has been a decline in annual average death-tolls as well as a reduction in the number of disasters with exceptionally high death-tolls, something which can be related to better management of floods, storms and famines. But at the same time the number of reported disasters, the estimated damage costs of disasters and the number of people affected have increased steadily and considerably (see **Figure 3.1**). Since 1980 6 of the 10 biggest disasters based on the number of people killed has taken place after 2001. (EM-DAT, 2009b; FIC, 2009; Scheuren et al., 2008; Basher, 2008; CRED, 2004)

Figure 3.3 Economic and human impacts of disasters*, 1973-2002



Source: UN/ISDR, 2004*b*:3

*Includes drought, earthquake, epidemic, extreme temperature, famine, flood, industrial accident, insect infestation, miscellaneous accident, land/debris-slide, transport accident, volcano, wave/surge, wildfire and windstorm.

For more clarifications and definitions of terms related to the issues of disaster and disaster management see ***Appendix X****.*

3.3 Disaster management

Disaster management can be described as a management approach that uses administrative, organisational and operational knowledge to implement policies, strategies and practical measures to lessen the impacts of disasters (UN/ISDR, 2004a). Modern disaster management must encompass "holistic analyses that treat hazard, risk and disaster as integrated phenomena" and avoid over-specialisation and "academic tribalism" that crate barriers to holistic forms of understanding (Alexander, 1997:298). The reasons for and the management of a disaster are complex issues which must be placed in a holistic setting and "new initiatives (should be) found in order to ensure that a disaster is viewed as a shared responsibility" (Trim, 2004:219).

The tasks of comprehensive disaster management may be divided into two phases: the pre-disaster phase and the post-disaster period. The pre-disaster phase includes risk identification, mitigation, and preparedness; the post-disaster phase is devoted to emergency response, rehabilitation and reconstruction (Freeman et al., 2003). By focusing on risk rather than the actual disaster and the response to it, it is possible to achieve a more proactive approach than the more traditional reactive approach within disaster management. By focusing on the major elements of risk management; risk assessment, reduction and transfer (Kreimer et al., 1999), it

is possible to achieve a desirable alternative to managing disasters through emergency response (Dilley, 2005).

Awareness of the potential benefits of disaster reduction has for years been limited to specialized circles, which is a big problem as collaboration and cooperation are crucial to disaster risk reduction and effective disaster management. Governments, regional institutions and international organisations should all engaged and be involved in issues related to disaster management, and cooperate with civil society, NGOs, the scientific community, the media, and the private sector, as they are all vital stakeholders (UN/ISDR, 2007*a*; UNDP, 1994). The lack of successful communication and cooperation regarding the benefits of disaster management to different public sectors and the public in general has been "due to a lack of attention for the issue, insufficient commitment and resources for promotional activities at all levels" (UNDP, 1994:7)

Elements strengthened by globalisation such as capitalism, marginalisation of the poor and politicised relief in developing countries have created more complex realities where fewer fixed assumptions can be permitted now than before (Alexander, 1997:299). This means we must rethink and adapt the way we conduct disaster management and support communities facing disasters.

Box 3.1 Disaster Management in the British Virgin Islands (BVI)

After Hurricane Hugo and as a consequence of the following disaster assessments in 1993 the focus of DM in the BVI shifted from response to mitigation. Through what has been described as an 'aggressive approach of the national disaster agencies', the level of public consciousness to adopt 'appropriate hazard resistant construction techniques' was raised through public awareness and education. At the same time the government showed its commitment to disaster mitigation in a practical way through exempting locally produced hurricane shutters from taxes. After this almost all new buildings in the BVI are equipped with hurricane shutters

Source: CGCED, 2002*a*:V

3.3.1 Investing in disaster management

The need for disaster mitigation and the level of investment in it is weakly correlated, and historically the international aid community has paid little attention to disaster mitigation and prevention (Alexander, 1997). Spending has been focused on relief and other reactive efforts, while prevention and preparedness initiatives and training have been downgraded.

How ever the actual spending on disasters management initiatives has increased since IDNDR put increased focus on the issues related to disaster mitigation and proactive contributions (BCPR, 2004; Merani, 1991, in Alexander, 1997), and also because the costs of disaster devastation has risen steeply (Alexander, 1997:293). The latter can be connected to e.g. the failure or negligence to establish proper building codes and structural protection.

For a poor country with other pressing issues related to development and poverty, spending money on mitigation and preparedness efforts towards natural disasters might for obvious reasons not be a priority. Such disasters are described as high-consequence, but low

probability events (Alexander, 1997; UN/ISDR 2004*b*). This calls for the creation and implementation of appropriate and cost effective measures and ex ante management tools in the areas which faces the highest risk of disaster (Dilley, 2005). Ex ante management tools are created based on probability and require funding today to reduce the consequences of an unknown, but probably occurring, future event. If that future event does not occur, the investment was for nothing and the funds which could have been spent on other projects benefiting society are lost. What it comes down to is a choice between growth and stability; should money be spent now and contribute to existing economic growth, or should funds be invested so that they might contribute to reduce or pay for future losses. "There is a need to establish an appropriate framework for balancing these two competing needs for developing countries with restricted resources and immediate poverty reducing needs" (Freeman et al., 2003). At the same time such frameworks are dependent on political will and leadership as "the political costs of redirecting priorities from visible development projects to addressing abstract long-term threats are great. It is hard to gain votes by pointing out that a disaster did not happen" (Christoplos et al., 2001:195). So the absence of an immediate guaranteed payoff for investments in risk reduction tends to discourage actual investments in DRR all together (Basher, 2008:937), even if what is costly in the short term may be more sustainable in the longer run (Cutter and Emerich, 2006:111).

Traditionally most of the funding within disaster management has been aimed at relief issues, despite the fact that most decision makers acknowledge the importance of also integrating mitigation and preparedness into policies. That relief is the actual priority of the decision makers is made evident by the funding patterns which show that both donor countries and the disaster prone spend most of their disaster management investments on relief, something which can be explained by the following:

- First, relief is media friendly, action oriented, easy to quantify and readily accountable to donor constituencies as concrete actions in response to a disaster.

- Second, emergency relief is easy to obtain as it is morally difficult to refuse aid to people and communities suffering abject misery and multiple deaths.

- Finally, the reality is that development programmers often neglect the importance of disaster reduction due to the absence of convincing analyses of trends and estimated losses. There is little demand by the development sector for reliable and systematic data on disasters to assess their socio-economic impact over the short term and even less so over the long term. As a result, disaster prevention activities often appear costly.

Source: CRED, 2004:13

If we are to see an increase in funding in the areas of disaster mitigation and preparedness it might be necessary to provide better and more systematic data related to these issues, so that the quality and availability of information regarding these issues can make a better basis for investment and funding decisions in mitigation and preparedness tools and measures. The larger part of information related to disasters is collected at the time of the emergency and calculations of risks and vulnerability assessments have had a lower priority than response. According to CRED focus on the post-disaster phase has been the dominate approach and little funding and policy priority has been given to issues such as community preparedness

either with national governments or with UN and other development institutions (CRED, 2004:13).

3.3.2 Policies and regulations as part of disaster management

> *"While some progress has been made, the cruel reality is that – helped by short sighted policies and practices – the vulnerability of our societies continues to grow."*
>
> Source: Holmes, 2007

There is a present need for decision- and policymakers all over the world to develop or modify their country's policies, laws and regulations in a way so that they truly integrate the concept of DRR (UN/ISDR, 2007*a*).The probability that policies directed at reducing risk or guaranteeing post-disaster resources will pay high dividends is evident (Freeman et al., 2003), and many countries have established policies and laws directed at DRR and DM, the Dominican Republic is one of them (Congreso Nacional, 2002). The problem how ever lies in allocating sufficient resources to support and maintain these policies. Commitment by national and local actors is required and natural hazards must be taken into account in public and private sector decision-making, but what is more important is the financial and resource support needed to actually give DM policies practical meaning. The commitment to DM demands a long-term view, but is often put aside by short sighted initiatives aimed at economic growth, rather than societal stability and sustainability.

Further more the concept of natural hazard risk and DM should be a part of the discourse or mode of thinking for policy- and decision making (Basher, 2008:937) in all sectors. The task of implementing disaster reduction measures is a multi-sectoral and multilevel one, and should systematically be implemented in all sectors, and "particularly in land-use planning, environmental management, infrastructure development, construction, agriculture, water resources, public health and social policy" (Basher, 2008:938). This is important as "broad-brushed approaches" developed only by one sector or one ministry alone reduces the possibility of considering local contexts and the differences in social vulnerability that are present at different localities (Cutter and Emerich, 2006:111).

3.3.3 DM at the international level

The international community working with disaster issues with its resources and information gathering capacity should be strongly committed to supporting data collection and encouraging the integration of disaster risk reduction into humanitarian and sustainable development programmes and frameworks. Attention by the large international organisations such as the UN should be given to assist disaster-prone developing countries with disaster risk reduction initiatives (UN/ISDR, 2007*a*). Two of the major international initiatives to fulfil these commitments came with the Yokohama Strategy and Plan of Action for a Safer World in 1994 and the Hyogo Framework for Action in 2005 (see **Box 3.3** and **3.4**).

As mentioned in the previous section little funding priority has been given to mitigation and preparedness issues compared to that of relief, meaning international preparedness is limited. Only rarely are partnerships between international actors and national or local actors set up

prior to disasters, and the support given by international actors aimed at local communities that does exist emphasises material and technical preparedness, rather than mapping local vulnerability and capacity, and strengthening the preparedness based on such local assessments (Telford et al., 2006:79).

When local and national capacity to cope with a natural hazard is insufficient the need for international support emerges. On the other hand no international assistance is needed when for instance disasters exceed the local capacity but fall within the national (Telford et al., 2006:41).

Box 3.2 Hyogo Framework for Action (HFA)

The Hyogo Framework for Action is a negotiated outcome of the World Conference on Disaster Reduction held in 2005 in Kobe, Japan. The Framework was adopted by the Member States of the United Nations and is the key instrument for implementing disaster risk reduction, targeting the following five priorities for action:

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.**

Based on these five areas of priority the UN seeks to provide guidance and practical support for vulnerable communities in the context of sustainable development, as one of the strategic goals of the HFA is the integration of disaster risk reduction into sustainable development policies and planning, and substantially reduce disaster losses by 2015.

"Since the adoption of the HFA, many global, regional, national and local efforts have addressed disaster risk reduction more systematically, much however, remains to be done."

Source: UN/ISDR, 2007*a*; UN/ISDR, 2005

Box 3.3 Yokohama Strategy and Plan of Action for a Safer World

The Yokohama Strategy was an outcome of the World Conference on Natural Disaster Reduction, held in Yokohama, Japan, from 23 May to 27 May 1994. In partnership with non-governmental organizations, the scientific community, business, industry and the media, the Member States of the United Nations expressed their concern and need for action related to the increasing devastation by natural disasters and the effects on humans and development, and adopted the Yokohama Principles, Strategy and Plan for Action. There are 10 principles (see **Appendix X**) and the final one goes as follows:

> **10. Each country bears the primary responsibility for protecting its people, infrastructure, and other national assets from the impact of natural disasters. The international community should demonstrate strong political determination required to make efficient use of existing resources, including financial, scientific and technological means, in the field of natural disaster reduction, bearing in mind the needs of the developing countries, particularly the least developed countries.**

Source: UNDP, 1994

The 2004 ISDR report *Living with Risk: A Global Review of Disaster Reduction Initiatives* (UN/ISDR, 2004*b*) suggested that the Yokohama strategy was probably more relevant 10 years after it was adopted.

3.3.4 DM at the national level

The HFA suggests that governments must work to achieve the objectives and priorities of the Framework. Governments are responsible for developing national coordination mechanisms, assess its DRR status, implement international regulations and integrate DRR with other national strategies and policies (UN/ISDR, 2007*a*).

For governments of developing countries the issues of disaster management are related to funding. As mentioned earlier the uncertainty related to possible future disaster occurrences discourages the assignment of political and financial priority to the problem. Government leaders will more often than not "visibly assign attention and resources to respond to disasters (rather than) labour unseen to reduce their root causes" (Basher, 2008:937). This often leads to national political focus on relief rather than preparedness. How ever central governments are in a strong position to guide, coordinate and implement hazard risk management measures, as it usually is national planning and sectoral agencies that develop and implement government policies and programs. The activities or lack there off related to both long- and short-term planning and investments can significantly increase or reduce a country's vulnerability to hazards. Most countries have national disaster offices (NDOs) or focal points (CGCED, 2002*a*) that are responsible for developing and implementing disaster preparedness, response and recovery efforts, though the actual outcome of NDOs may vary significantly based on e.g. present political will, power and priority.

One way to underline the importance of and gain international support for national and local disaster risk reduction and participatory risk assessment, countries can incorporate aspects of disaster management into Poverty Reduction Strategy Papers (PRSP). The PRSPs inform the

concessional lending by the WB and the IMF under the Heavily Indebted Poor Countries (HIPC) initiative and shape strategies for support from bilateral agencies (Pelling, 2007:374). How ever by mid-2003 only eight (25%) of the 32 completed PRSPs incorporated some aspect of risk management (DFID, 2005).

3.3.5 DM at the local level

> *"Local governments, where they exist and function must be given the ability to guide local hazard risk management efforts through policies which encourage local participation and through the provision of technical assistance to local groups."*
>
> Source: CGCED, 2002*a*

Hazards may have international origins, but most often create local disasters, with the most devastating affects for the poorest population. But as mentioned earlier DM is a task which can be dealt with at different levels by different actors. At the local level, civil society and local governments can play important roles in DRR. For example local organizations and groups serve communities and have valuable knowledge and contacts in specific geographic areas. Local community members have a great chance of identifying local practices and development which can possibly increase or reduce local vulnerability.

Good communication with national and regional levels is also very important for the local level, and vice-versa. If national policies are to be implemented locally and local vulnerabilities are to be considered nationally, sound cooperation between the different levels of is necessary. An example of such practical cooperation is when national disaster and emergency management organizations supports and is supported by local disaster committees which implement local activities and distribute important disaster information (CGCED, 2002*a*).

National models of mitigation and preparedness have often been too top-down and technology driven too make much impact on local vulnerability reduction (IFRC, 2002), and central governments in developing countries often possess narrow power structures with limited concern for local issues. This has given increased support for more community-based approaches to DM and also supports the suggestion to let community-driven projects and programs developed by NGOs, be the main contributor of local DM initiatives. "Such an approach to risk management is not guaranteed to be comprehensive, but applies directly to identifiable needs and the empowerment of local populations" (Freeman et al., 2003). According to Somers and Svara there is also a chance that local government leaders will pay more attention to other issues when the prospects of a crisis seem remote, meaning the need for DM doesn't become obvious before a crisis occurs (2009:181)

The study by Nilsen and Olsen (2005) on risk management and assessment in municipalities implies that professionalism among street-level bureaucrats is more important than organisational strategies when it comes to the operational level of local risk assessment and management. When government regulations shape a strict framework for safety management, the potential success of local risk management efforts relies on the people working for the local authorities, and not the strategies they are working by. Whether the strategies are bottom-up or top-down, how they are stated is not the most important issue. It is how the local

bureaucrats implement them and how they put mitigation and preparedness initiatives into practice that counts and makes a difference.

Findings presented in the discussion draft *Natural Hazard Risk Management in the Caribbean: Good Practices And Country Case Studies* presented by the Caribbean Group for Cooperation in Economic Development (CGCED) and the WB it is suggested that "decisions that can be made and actions taken close to the individual- and community-level have more immediate and significant effects than do more distant ones" (CGCED, 2002*b*:9). The *appropriate management level* for certain kinds of DM issues might very well be at the local level. (1) Communities and community organizations, (2) local government institutions and (3) local disaster committees are examples of possible local disaster management actors:

(1) Local communities and their different organizational structures e.g. churches, women's groups and small business cooperatives, possess local social-, demographic- and economic knowledge and can easily spread information, and thus they have the possibility to identify and share information regarding developments that increase or decrease hazard vulnerability.

(2) Well functioning local government institutions have experiences related to local structural and management issues as well as an understanding of local conditions, and can guide local vulnerability reduction efforts through policies and technical assistance.

(3) Given their local connection and knowledge local disaster committees may implement plans and activities described by national disaster organizations in a more context specific and appropriate way than organizations anchored at higher levels.

3.4 Pre and post disaster management

> *"Disaster prevention, mitigation, preparedness and relief are four elements which contribute to and gain from the implementation of sustainable development policies."*
>
> Source: *Yokohama Strategy and Plan of Action for a Safer World*, UNDP, 1994

How people and communities, as well as professionals and practitioners working in the field of DM, handle the pre and post disaster phase will affect the sustainability of existing development in a society. At the same time prospective existing sustainable development initiatives can affect disaster management actions, both in the pre and the post disaster phase. If one is working with and focusing on pre-disaster activities it is important that one doesn't forget or ignore post-disaster efforts, or assume that the pre-disaster initiatives are so well implemented and functioning so that post-disaster work is less important. It is suggested that it might be more beneficial or effective to invest in preparedness and mitigation, rather than focusing efforts on response, and that this is the most cost effective DM approach given the projected increase in frequency and intensity of disasters (FIC, 2009:21). There attention has increased towards taking proactive measures within current disaster management approaches, but the reactive and more traditional approach must be an integral part of modern disaster

management, anything else will increase vulnerability and the effects of disasters (McEntire, 2001).

It is important to understand what enables people to cope with, recover from and adapt to the risks they face, and one must build responses on the community's own priorities, knowledge and resources (Clinton, 2006). Furthermore one should scale up community responses, by creating new coalitions with governments and advocating changes in policy and practice at all levels. Instead of focusing on needs and vulnerabilities, the IFRC suggests increased focus on building capacity and resilience (2005).

3.4.1 Mitigation and preparedness

> *"Lack of preparedness can not be justified in an age in which the geographical pattern of disaster areas is well known, the recurrence interval of many disasters is estimable and relief methodologies have been globalised."*

Source: Alexander, 1991:295

The social and structural vulnerabilities of a poor society are created by pre-disaster conditions and policies integrating DM and reducing these vulnerabilities before a disaster occurs seems like a sensible choice (Nigg, 1995, in Kapucu, 2008:244). Further more it is necessary to find the will and the resources to invest much more in DRR and preparedness measures, and strengthen local structures, as well as create partnerships between and participation at all the different levels of DM (Clinton, 2006). Successful participation in pre-disaster processes might even improve the ability if a community to respond.

Box 3.4 Disaster preparedness in practice: "Disaster Prevention Day"

Japan prides itself in being well-prepared for earthquakes. The country has every year on September 1st since 1960 held a Disaster Prevention Day were people all across the country participate in disaster preparedness drills, involving both emergency workers and the general public. The aim is to disseminate disaster prevention knowledge and raising public awareness.

Source: MoFA, 2009

When investing in mitigation and preparedness efforts the investments should be made so that they provide for the long-term welfare of the community (Somers and Svara, 2009:181), as the scale of disaster impacts is closely linked to the failure to mitigate hazards (Alexander, 2005). Individuals and their communities can decrease the likelihood of morbidity and mortality by giving attention to community disaster preparedness, response, and recovery before an event occurs. However, individuals, communities, and community organizations vary in their level of preparedness; this may be due to i.e. social structures or access to resources. Through "instituting plans and programs to cope with potential disruption or destruction of physical and social systems", Godschalk (1991:142) describes preparing as the only mitigation action that can be taken at the local level, and thus motes the limits of

preventive measures. How ever according to the Yokohama strategy (UNDP, 1994) preventive measures should involve local community participation.

Preparedness has been a limited research area, but there are findings reviling that most disaster plans and preparedness activities have been based on false assumptions on human and organizational behaviour (Quarantelli, 1984, in McEntire et al., 2004). The assumptions that people will panic and be unable to cope with what is happening and be dependent on outsiders, are at least exaggerated, if not completely false, as most people do not exhibit antisocial behaviour, but rather initiate important and vital activities such as search and rescue, without the help of outsiders (McEntire, 2004). Furthermore without being prepared for a disaster people are still often well capable of finding shelter on their own and sticking around to help after a disaster has occurred.

When it comes to actual preparation for disasters there is no one-size-fits-all approach. Preparedness, response and recovery plans must take into account the temporal and spatial changes in social vulnerability. If not the mitigation efforts may turn out to have little effect when it comes to improving local resilience to hazards (Cutter and Emerich, 2006:102). This means that while preparing for the physical pressure imbued by a disaster can fairly easily be done by studying data produced based on historic events, the temporal and spatial vulnerability of social aspects are harder to prepare for (Cutter and Emerich, 2006).

"One could argue that persistent trends in demography, urbanisation and the use of hazard zones tend to counteract any gains in protection against disasters" (Alexander, 1997:300), and if we add this to the insufficient amount of resources spent on mitigation and preparedness globally, than we have a problem. According to the report *The Humanitarian Costs of Climate Change* made by the Feinstein International Center the intensity and frequency of disasters will increase, hence far more resources will be required to maintain even the existing levels of preparedness and response, which is only about 50-70% of what is actually appealed for (2009:20). If we are to met the increased challenges of future disasters more resources are needed, and actors working with DM need to be more efficient, flexible and better prepared (FIC, 2009:20).

3.4.2 Two important pre-disaster issues: EWS and education

Two of the Yokohama principles (UNDP, 1994) which point to specific mitigation and preparedness actions that concerns local communities in a practical way, are number 5 and number 7:

5. Early warnings of impending disasters and their effective dissemination are key factors to successful disaster prevention and preparedness

7. Vulnerability can be reduced by the application of proper design and patterns of development focused on target groups by appropriate education and training of the whole community.

According to the former UNEP Executive Director Klaus Toepfer "it is increasingly clear that we need a multi-hazard early warning system that should represent a new way of thinking and ensures that environmental stability factors based on local wisdom and knowledge are built into disaster plans" (UN, 2005). Early and timely warning may save a large number of lives

but to effectively utilize EWS government commitment and investment is crucial (Alexander, 1997:296), as is the reliability in such a system. Public reaction to warnings might possess difficult dilemmas (Sorensen and Mileti, 1987). Conflicting, inconsistent or wrong information or recommendations may cause the public to disregard information underestimate events or perhaps just follow the warnings that results in the least inconvenience (Fitzpatrick, 1999 in Kapucu, 2008:247; Kapucu, 2008:247) (see **Ch. 5.5.1**, **Box 5.1**).

As for training and education these are issues which are important at all levels if DM is to be effective and appropriate. To stimulate awareness and share knowledge on crucial matters of DRR and DM needs to be done with the support of political leaders, managers, professional groups, and the general public (UN/ISDR, 2007*c*). The importance of education is also emphasised by the HFA (see **Box 3.3**) and the UNDP, and in poor communities education is an important tool for both poverty reduction as well as risk and vulnerability reduction.

Box 3.5 Early warning in Cuba

Cuba's EWS makes the island one of the best disaster prepared countries in the Caribbean. 72 hours before a storm makes landfall, the national media issues alerts, and civil protection committees check evacuation plans. 48 hours before expected landfall, authorities target warnings for high-risk areas. Twelve hours before landfall, homes are secured, neighbourhoods are cleared of loose debris, and people are evacuated. The effectiveness of the Cuban EWS was proven when hurricane Ivan which was one of the worst hurricanes in 10 years, struck in 2004. Over 2 million people were evacuated, and no one killed.

Source: UN/ISDR, 2007*a*

3.4.3 Response and recovery

In the past disaster management has been too reactive focusing mainly on relief according to McEntire (2001:195), so more pro-activity and mitigation in the field is needed. Alexander on the other hand implies that there is a possibility that the global population rises faster than protection measures can be devised (2006). Looking at the definition of disaster presented earlier we stated that disaster has to do with coping capacity, so when a disaster is a fact in a local community it means outside assistance and response by national or international actors is needed (Telford et al., 2006:41). Hence response and recovery measures will remain important elements of a holistic DM approach, even if pre-disaster activities should get broader attention and more funding.

The need for quick and urgent attention and repairs of disaster damaged communities often leads to poor and unsustainable reconstruction and rehabilitation work, and in addition to budget pressures and ill communication the rebuilt community most often isn't left strengthened in order to face another future event, which is something sound recovery work should (CGCED, 2002b). And the recovery period provides a good opportunity to assess community vulnerability and implement DRR measures aimed at future events.

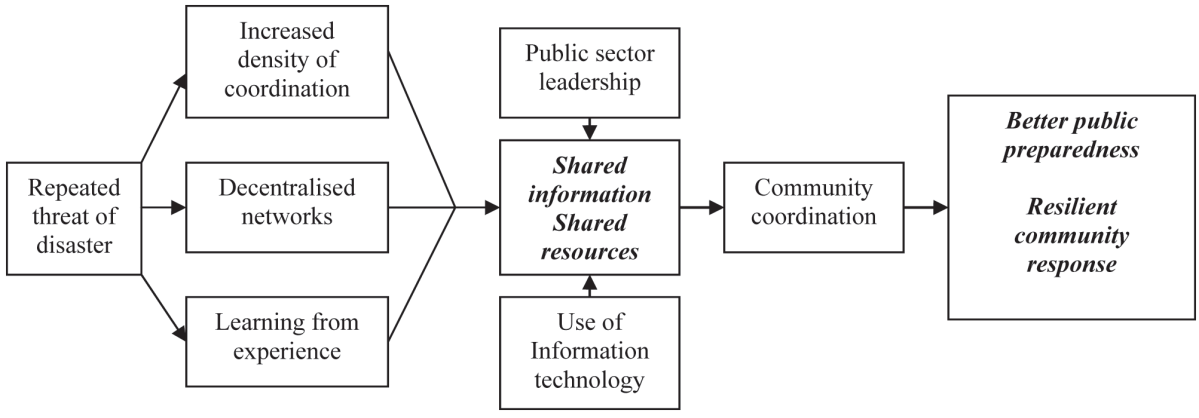
There are distinctive and obvious differences in what is being done and what can be done at the pre- and post-disaster stages. According to David Alexander the issues of recovery and

reconstruction are essentially local as the key to success lies with local community support and participation. This is supported by the fact that in the cases when "governments, foreign donors and the international relief community have taken a paternalistic attitude to recovery from disasters have led to failure - or at least underperformance - and dissatisfaction on the part of the beneficiaries, who are usually survivors and other local people" (Alexander, 2006:16). This supports the statement that it is necessary for actors working within relief and recovery to be better at utilizing and working alongside local structures and pay attention to local knowledge and expertise. The intentions might be good but the assistance provided by external actors often leaves the community they're trying to help on the sideline, when what is really important is to strengthen and not undermine local actors (Clinton, 2006).

When a disaster hits, the work of helping those affected is not just about providing food, water, shelter, "but about enabling beneficiaries to regain control over their own lives" (Wall and Robinson, 2008). By aid workers in complex emergencies the lack of resources in the filed is described as a constant problem in disaster ridden areas (Hearns and Deeny, 2007), and maybe this is where the biggest contribution can be made by the international community.

What might prove to be a well functioning approach to DM in a post-disaster situation is to create a sound balance between "imported and indigenous sources of knowledge, and favouring the latter when it is able to produce good results without compromising safety and equity" (Alexander, 2006:16). More often than not local people are the first responders to a disaster, which mean they hold knowledge related to crucial stages of a disaster which should not be ignored. The working culture of relief organisations we see today is often characterized by a mode of working as if there is no tomorrow, something which is not necessary. When first response already is provided by locals, it is possible take some time, assess the situation and communicate and coordinate with locals to ensure that one does the right things, in right amounts, in the right order with the right resources (Larsen, 2005). According to Bristow heightened communication with first responders and communities at risk is one of the most important ways to minimize the effects of a disaster (2004:20, in Kapucu, 2008:247), and conducting this communication prior to a disaster is a key aspect of truly effective community preparedness and response (Tobin and Montz, 1997). Open and full communication is also important in order to create necessary local community support for outside assistants (Trim, 2004).

Figure 3.4 Coordinated community response to a disaster



Source: Kapucu, 2008:248

Quarantelli describes 10 criteria for good management of community disasters where communication and coordination are essential aspects:

1. Recognize correctly the difference between agent and response generated needs and demands
2. Carry out generic functions in an adequate way
3. Mobilize personnel and resources in an effective manner
4. Involve proper task delegation and division of labour
5. Allow the adequate processing of information
6. Permit the proper exercise of decision making
7. Focus on the development of overall coordination
8. Blend emergent aspects with established ones
9. Provide the mass communication system with appropriate information
10. Have a well functioning Emergency Operations Center (EOC)

Source: Quarantelli, 1998*a*:19-32

A final note is that whether we focus on proactive or reactive measures, there might be reverse effects of prevention and response to disasters. In 1977 Robert E. Wise jr. claimed that relief is the real disaster after West Virginia (USA) was declared a national disaster area due to heavy rains and flooding. As a local college professor described it: "The area was hit by two disasters; the first was the flood, the second was the federal relief effort" (Wise, 1977) (cf. "Marta", ch. 5.2.2., p. X). this is important to keep in mind when working within the field of DM.

3.5 Sustainable development and disasters

3.5.1 Sustainable Development

The concept of sustainable development is dynamic and defined in different ways. It has become a prominent phrase in the current development discourse and also a powerful oral tool to put focus on development and drive it forwards (Adams, 2001). The phrase is a product of the World Commission on Environment and Development held in 1987, which produced, what has later been called the Brundtland report; *Our common future*, a report which set out a 'global agenda for change' (Adams, 2001:2), and defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987:43).

However if we are to experience a global change for the better, then actions must be put behind the words. The needs of future generations and the social, economic, political and not least environmental situations of the future are hard to predict. Further more, even if sustainable development issues are of global concern, there are still many regional and local issues that take on special relevance or sharper focus when viewed at a smaller scale (UNEP, 2002). Hence development has a context specific meaning and sustainable development must be a discussion including economic, social and environmental aspects, and sound environmental, political and economic management should be conducted from the family up to the international level (Walker 1989, in Trim, 2004).

One might describe mainstream sustainable development as an approach to tackling the risks of modernity, and about people's capacity to manage their natural environment, and the systems they use to exploit it in a manner which safeguards their and their children's future (Trim, 2004).

Figure 3.5 Six principles of sustainability

1. Maintain and enhance quality of life

2. Enhance economic vitality

3. Ensure social and intergenerational equity

4. Maintain and enhance environmental quality

5. Incorporate disaster resilience and mitigation into actions and decisions

6. Use a consensus-building, participatory process when making decisions

Source: Monday, 2002, in UN/ISDR, 2004*b*:18

3.5.2 Natural hazards and poor communities

Poverty and environmental degradation is strongly linked (UNEP, 2002) and "there are clear signs that this exacerbates the impact of disaster" (Alexander, 1997:287), hence flawed development drives disasters (IFRC, 2002:11). At the same time destruction by natural disasters typically has disproportionate impacts on the poorest and most vulnerable populations including women, children, youth and the elderly (UNDP/BCPR, 2009). Further more poverty is also linked to overpopulation and where population pressure exceeds the carrying capacity of the land disasters will have the most profound and during impacts (Alexander, 1997:288).

According to David Alexander natural disasters are less salient problems for poor people than for people who are not so poor. The reason for this is that poor people have a higher *total vulnerability* given their "precariousness of life in general" (1997:292), and disasters will not fundamentally change poor people's situation, they merely magnify the existing social and economic trends (Kates, 1977). The pre-event economic status and quality of life in a community also nearly always continues post event, so if the community struck by a disaster is stressed economically it will continue to be so long after the disaster recovery and reconstruction is finished (Cutter and Emerich, 2006:103), even if a community's own response to a disaster might play an important role regarding whether the community

becomes more entrenched or breaks out of the "vicious cycle of vulnerability" (McEntire, 2001:194).

A country's economic stage of development; e.g. the level of financial flows and the capabilities of the government to raise revenues are related to the economic impact of a disaster as "least-developed economies typically are perceived as most hazard vulnerable" (Benson and Clay, 2000:56). Research has indicated that during the three previous decades low-income countries with similar levels of per capita income have experienced different paces of economic development depending on how hazard-prone the countries are; the more hazard-prone a country is, the less rapid the economic development is (Benson and Clay, 2000).

Countries at a low stage of economic development have typically invested little in risk reduction measures and warning systems, leading to what may be described as unnecessary high losses of human life and exacerbating existing levels of poverty and indebtedness. While countries at an intermediate stage of economic development are more likely to have financial structures and policies as well as small-scale private savings and transfers, which may diffuse the economic impacts of disasters more widely. How ever this is not to say that increasing economic development immediately and automatically reduces hazard vulnerability. Declining traditional coping mechanisms, changing family and social structures, as well as rising land pressure, increased marginalization of poorer groups and increased environmental degradation are some aspects often related to the initial stages of increasing economic development which suggests that "poor and socially disadvantaged groups become more vulnerable to hazards" (Benson and Clay, 2000:56). The government of an intermediate economy is also "more likely to meet a larger share of the costs of the relief and rehabilitation efforts, rather than relying almost entirely on international assistance" (Benson and Clay, 2000:57). According to the director of CRED developing countries should invest more resources in disaster prevention, as they develop economically and reach what may be defined as intermediate levels of economic development, since their economic vulnerability increases simultaneously (Bjergene, 2009).

Due to increased investments in disaster prevention, mitigation, and preparedness measures; improved environmental management; reduction in the scale of absolute poverty and thus of household vulnerability; and private insurance schemes covering disaster damages, the economic impacts of disasters are likely to decline when countries reach the later stages of economic development (Benson and Clay, 2000:57).

An interesting point made by Professor Will Steffen from the Australian National University (ANU) is that more than 1 billion people are "counting" on natural hazards such as the annual monsoons to appear like they have always done and if these "reliable" patterns change it means a big change in the global system of environment and population (Pileberg, 2009). Hence people adapt to the situations and threats their communities face and therefore DM actors should not just focus on the vulnerabilities of poor communities since they can do things for themselves and capacities do exist and efforts by external DM actors should also be focused at strengthening these capacities (IFRC, 2004)

3.5.3 Disasters threaten development

> *"Even though national and local authorities bear the main responsibility for the safety of their people, it is the international community's duty to advocate policies and actions in developing countries that pursue informed and well designed disaster risk reduction strategies, and to ensure that their own programmes reduce and do not increase disaster risks."*
>
> Source: UN/ISDR, 2004*b*:387

The magnitude of disaster impacts increases more in poor developing countries, than in more developed countries, and as long as preparedness and prevention remains inadequate, disasters will remain a major unsolved problem for sustainable development in developing countries (Basher, 2008). In her paper *The Creation of vulnerability to natural disasters: Case studies from the Dominican Republic* Susan E. Jeffery argues that natural disasters are not a category of events that can be separated from the broader issues of development (1982:38), as natural disasters create serious setbacks to the development process (CRED, 2004:13). Therefore it is important that development efforts, especially those initiated by the international community "aspire to promote social, political and economic advances and minimize the possibility that such progress may be nullified by disaster" (McEntire, 2001:194). For the international development actors it's also very important that their development programs incorporate the vulnerability factor of its effects and contributions, and altered or changed patterns of increasing vulnerability so that they reduce vulnerability instead (McEntire, 2001).

David A. McEntire emphasises that vulnerability must be understood and directly addressed if the effects of disasters are to be reduced (2001). He refers to what he calls *invulnerable development*, which is a sustainable development thought that also encompasses the concept of vulnerability reduction in all development decisions and activities. At the same time as development activities should be linked to vulnerability issues, the capacity, cooperation and effectiveness of people and organisations working with vulnerability reduction and disaster management needs to be increased, if the disastrous threat to development is to be limited (McEntire, 2001). This underlines the need for good management in a situation where poor communities and private organisation are to cooperate in the work towards making communities threatened by natural disasters more resilient.

3.5.4 Sustainable development and disaster management

Since the publication of the reports *Reducing Disaster Risk: A Challenge to Development* (UNDP/BCPR, 2004) and *Disaster Risk Reduction: A Development Concern* (DFID, 2005), mainstreaming disaster risk reduction into development planning and that disaster risk accumulates within inappropriate development has gained recognition (Pelling, 2007).

The BCPR report focused among other things on bringing disasters and development together, as "a developmentally informed perspective on disasters lies (between) development planners and disaster risk reduction practitioners" (UNDP/BCPR, 2004:17). The end of the previous millennium and the start of the current one saw several major disasters occur in all corners of the world. This led to a more articulated and serious consideration of the disaster-development relationship and discussions surrounding the social and economic causes of

disaster risk. The result was that reducing disaster risk was acknowledged as a long-term engagement with processes of international development (UNDP/BCPR, 2004). Also in the ISDR publication *Living with Risk: A Global Review of Disaster Reduction Initiatives* (UN/ISDR, 2004*b*) the issues of disaster mitigation and sustainable development came together.

A simplistic link between sustainable development and disaster management can be outlined as follows; poverty reduction (a sustainable development issue) means reduced vulnerability, and reduced vulnerability means reduced impacts of disasters (a DM issue) (Alexander, 1997). A problem how ever is that theories which link e.g. emergency relief and development assistance are rarely manifested in practical situations and activities (Larsen, 2005).

Disasters undermine hard-won development gains and have devastating effects. But through integrating natural disaster programs with overall development objectives, governments and communities may minimize their losses (UN/ISDR, 2007*b*). According to the Inter-American Development Bank (IADB) risk assessment is an essential part of such an integration process (Freeman et al., 2003), and because of the enormous development losses suffered around the world from disasters, "development banks and international assistance institutions now increasingly place importance on integrating risk reduction into development policies and practices" (UN/ISDR, 2007*b*).

In the beginning of the chapter I gave a brief introduction to the evolution of the concept of disasters. Here it seems sensible to give a short introduction to the evolution of DM and its road towards being a development issue. Until the 1970s a dominant view prevailed that natural disasters were synonymous with natural events which were not avoidable, and the national and international emphasis was mainly on response. From the 1970s onwards technical professionals recognized that natural hazards had varying impacts on different structures, and disasters became more associated with its physical impact than with the natural hazard. How ever due to the costs, the efforts of mitigating losses through physical and structural measures have been minimal. The newer emphasis on peoples capacity to handle disasters and their social and economic vulnerability in relations to the impacts of natural hazards, also spurred in 1970s, with increased emphasis in the two following decades. Those studying the field now saw that natural hazards had widely varying impacts on different social groups and on different countries and "the causal factors of disaster thus shifted from the natural event towards the development processes that generated different levels of vulnerability" (UNDP/BCPR, 2004:18). Since the 1990s and till now the approach to disaster management has become more holistic and strategies build on the notion that all development activities have the potential to increase or reduce risks (UNDP/BCPR, 2004:18), and where they increase risks disasters may function as indicators of the failed development and "provide opportunities for reforms which can draw attention to the failures of current development models" (T'Hart, 2001, in Cristoplos et al., 2001:195)

Bringing disaster risk reduction and development concerns closer together requires three steps:

1. The collection of basic data on disaster risk and the development of planning tools to track the changing relationship between development policy and disaster risk levels.

2. The collation and dissemination of best practice in development planning and policy that reduce disaster risk.

3. The galvanising of political will to reorient both the development and disaster management sectors.

Source: UNDP/BCPR, 2004:27

3.6 Private organizations working with poor communities

> *"NGOs may be cost effective, may deliver services to difficult-to-reach population groups, they may be able to innovate, and they may display other attributes. The most important factor however, is their potential for helping to ensure that people - in particular vulnerable groups - become more involved in decisions that affect them in development planning and resource allocation."*

Source: Clark, 1995:600

The key to establishing preventive measures at the local levels lies in cooperating with civil society (Bjergene and Bolle, 2009). In many poor countries the governments are too weak, lack resources, unwilling or too occupied with other issues to provide the right support for communities facing natural disasters. If local communities are to get the right information and education necessary to implement well functioning mitigation efforts than civil society must play an active part.

"It has been said that the nation- state has become too small for the big things and too big for the small things" (Streeten, 1997:194), by this statement is meant that through what is referred to as globalization nation states have become more entrenched and affected by international actors and conditions than ever before, but at the same time they are unable to control or sometimes even handle these new conditions. The emergence of more global e.g. economic and political issues has put the individual nation states at the sideline in many respects, an forced them to become part of an international community, and it's *this community* which takes care of *the big things* (Streeten, 1997). This partaking in a global society and the influencing global conditions occupies a lot of a nation states attention, which means smaller and more local issues are neglected or ignored. At the same time globalization has reduced the distances between people and organizations, and communities from all over the world can interact and cooperate with each other in a fare more effective way than ever before. This means that the *small things* which governments are not interested in any more, may catch the attention of other actors, such as NGOs working with development. And there are areas and functions which smaller agents might handle better than central governments.

NGOs have become important actors within the area of development assistance and in some cases promote development in better ways than government institutions and public sector organisations (Streeten, 1997; Clark, 1995). There are different reasons for this:

- Their ability to reach, mobilize and empower poor and remote communities.
- Their participation in bottom-up, grassroots processes of project implementation.
- Their capacity to innovate, experiment and be more flexible than governments can.
- Their efficiency to carry out projects at low costs

- Their promotion of sustainable development.
- Their representivity in civil societies, and often close links with poor communities.

Source: Streeten, 1997:195; Clark, 1995:594

This is not to say that all NGOs encompass these attributes and abilities, as many development projects fail. It depends on the NGO, the government, and other factors, but NGOs often have resources that may "fill in the gaps" or "serve as a response to failures in the public and private sectors" (Bratton, 1990, in Clark, 1995:595). And even if NGOs have their faults, it is said that they might do less harm than governments (Streeten, 1997:209).

The deficiencies of governments may be overcome by NGOs, especially the best NGOs which take pride in their moderate size, specific local interests and involvement. Their goal is to raise the self-confidence and self-reliance of the poor, and help them see unexploited opportunities for improving their lives and reduce present risks. The best-practice NGOs are also socially and culturally sensitive, which is very important as sustainable development is best achieved when the local context is considered (Streeten, 1997:209).

The importance of NGOs with diverse contributions and specific interests has increased through the years as "official donors and many governments have given greater attention to poverty reduction and environmental sustainability" (Clark, 1995:594). If governments want for instance to direct their focus towards combating environmental degradation, local gender issues or community risk reduction its "normal macro instruments" may very well be inadequate, as national policies, regulations and market mechanisms "are rarely sharply targeted toward vulnerable groups", so the involvement of an NGO, working e.g. with DM, might prove more efficient and developmentally friendly (Clark, 1995:594).

According to Clark NGOs may work *with* governments, run their projects *parallel* to those of the government or even play an *oppositional* role to the government (1995:593). How an NGO chooses to work will rely on different conditions and contexts. Where poor people need empowerment and a powerful voice, NGOs may stand out as a critical ingredient in a society characterized by injustice. And rather then *supply* services or development projects in poor communities, they may listen to *demand* and help communities articulate their preferences and concerns, and make them a part of the development process and the strengthening of their communities (Clark, 1995:593)

If the full potential of NGOs is to be realised certain factors have to be in place, e.g. funding for the development activities and a tradition for voluntary activity. The most important factors however are the local government policies, practices and attitudes where an NGO is to operate. An enabling environment has a major "influence on the capacity of NGOs to operate and grow" (Clark, 1995:595). As stated in the beginning of this section the most important NGO attribute is their potential to help vulnerable groups become more involved in what concerns and affects them, and this "pursuit of participatory development" should be a good enough reason for governments to create such enabling environments (Clark, 1995:600).

3.7 Theoretical framework

Comprehensive disaster management incorporates both pre- and the post-disaster issues. Through a shared responsibility approach between all the actors working in the field of DM and with a holistic understanding of the concept of disasters and disaster management, it is possible to achieve a desirable alternative to managing disasters through emergency response. Awareness of the potential benefits of disaster reduction has for years been limited to specialized circles, which is a big problem as collaboration and cooperation are crucial to disaster risk reduction and effective disaster management. Today globalisation has created more complex realities so it is crucial to raise awareness and rethink and adapt the way we conduct disaster management and support communities facing disasters (UN/ISDR, 2007*a*; Dilley, 2005; Trim, 2004; UN/ISDR, 2004*a*; Kreimer et al., 1999; Alexander, 1997; UNDP, 1994).

Traditionally reactive DM activities have gotten more attention and funding, but still hold many areas for improvement. While the possibilities for high dividends on investments in improved proactive measures is evident. Even if natural disasters are low-probability events, they are probable enough, and investing in stability should be a priority, just as seeking economic growth (Basher, 2008; Cutter and Emerich, 2006; CRED, 2004; UN/ISDR 2004*b*; Freeman et al., 2003; Alexander, 1997). This means that the concept of DM should be an integral part of policies and regulations. If one avoids short-sightedness in policies aimed at DM issues they might pay high dividends (Basher, 2008; UN/ISDR, 2007*a*; Holmes, 2007; Freeman et al, 2003; Congreso Nacional, 2002).

Poverty and environmental degradation is strongly linked and increases with unsustainable development, which in turn makes poor and socially disadvantaged groups become more vulnerable to hazards. These factors exacerbates the impact of disasters, hence sustainable development is important for the reduction of disaster effects. The fact that disasters undermine hard-won development gains has gotten increased attention and reducing disaster risk is now acknowledged as a long-term engagement with processes of international development, hence disaster risk reduction and development concerns has come closer together (Bjergene, 2009; UNDP/BCPR, 2009; UN/ISDR, 2007*b*; DFID, 2005; CRED, 2004; UNDP/BCPR, 2004; IFRC, 2002; UNEP, 2002; McEntire, 2001; Benson and Clay, 2000; Alexander, 1997; Brundtland, 1987)

A disaster occurs when the effects of an event exceeds the coping ability of a vulnerable community, and may be described as a complex interaction between the natural and human worlds. Specifying community vulnerability may create greater understanding of the total vulnerability to disasters, which is important in order to establish effective prevention measures. At the same time sustainable development should be promoted as this helps reduce vulnerability (EM-DAT, 2009*b*; Basher, 2008; CRED, 2004; UN/ISDR, 2004*a*; Freeman et al., 2003; Alca´ntara-Ayala, 2002; Cutter, 2001; McEntire, 2001; Aysan, 1993; DHA, 1992;).

Weak or preoccupied governments with inadequate micro instruments might not be able to support or help poor communities as well as NGOs when it comes to certain local issues. NGOs have the capability to raise the self-confidence and self-reliance of the poor, and are often socially and culturally sensitive and emphasis participation, which are important factors for sustainable development as well as the effectiveness of community preparedness and response. Successful participation in proactive DM processes supported by NGOs can

improve the public in effective preparations for a potential disaster (Bjergene and Bolle, 2009; Kapucu, 2008; Streeten, 1997; Clark, 1995).

Hazards may have international origins, but most often create local disasters. And due to e.g. climate change natural disasters will increase in frequency and intensity. The last 5 years many global, regional, national and local efforts have addressed disaster risk reduction in a more systematic way than before, in order to handle future disaster events. But disaster risk reduction should have an even higher international as well as local priority. The international community must address these issues and bear in mind the needs of the developing countries. Through mapping of local vulnerability and capacity, and by strengthening local disaster management actors such as community organizations, local government institutions and local disaster committees, communities may become better prepared for future disasters (FIC, 2009; Telford et al., 2006:79; UN/ISDR, 2005; CGCED, 2002*a*; CGCED, 2002*b*; UNDP, 1994).

Chapter 4 Research Approach and Methodology

4.1 Introduction

> *"There is indeed no such thing as 'the' scientific method. A scientist uses a very great variety of exploratory stratagems."*
>
> Source: Medawar, 1986

One often distinguishes between research of the physical and natural world and research in the social world. While the former is an ancient human activity, modern social science is often argued to be a phenomenon of the 20th century (Remenyi et al, 1998). As social research seldom leads to the development of stabile and rigorous laws which are as transferable as natural laws developed from natural science research, some natural scientists suggest that social science is not proper science. How ever as Habermas (1993) describes we now think more tolerantly about what might count as research, and already back in 1844 Karl Marx proclaimed that the two directions would incorporate each other so that we would ultimately end up with *one* science.

The goal of research is to find reasonable and sound answers to important questions that will further our understanding of human society and behaviour through scientific methods (Salkind, 2009:5). As there are many issues and subjects about which we have incomplete knowledge, we can use the research process to discover new knowledge (Remenyi et al., 1998). Through different research projects new insight and new speculations come together and forms a body of knowledge related to a subject (Salkind, 2009). When conducting social research there are several different ways of obtaining data and the approach and strategy one chooses must relate to the topic one is researching as different strategies and methods have different strengths and weaknesses.

One might view social research as a coming together of what is ideal and what is feasible (Bryman, 2004:23), and this coming together might be a rather unstructured process and the road to a research result is unpredictable.

4.2 Research approach and process

I have stated my general research questions (see ch.1.4) and now the design of my research describes a plan I propose to follow when conducting my research.
My research is not related to a specific theory, but is rather fuelled by the international discourse concerning climate change, natural disasters and the human response to these issues (Bryman, 1998:7). International debate, articles and literature on the issues related to disasters have functioned as the spur to my enquiry and may be described as acting as a proxy for theory. The issues I have chosen to focus on are of great importance when trying to better the situation for people that are affected by and facing natural disasters. And instead of trying to 'fit' their situation into an existing theory, I find it more interesting to take an inductive

approach and based on my research questions I conduct my research and analysis and see what the results might reveal.

The social science field has long been split between quantitative and qualitative researchers, and characterized by an *either-or* debate (Punch, 1998), meaning some scientist claim that the social world can only be researched with the use of quantitative methods, while others claim a qualitative approach is more suited, as "no good researcher should dirty their hands with numbers". This is how ever an out-dated statement nowadays (Silverman, 2001:35). A more modern view has increased interest in the combination of the two approaches (Bryman, 1988; 1992; Hammersley, 1992; Punch, 1998).

4.2.1 Research strategy

The strategy of the research has to do with its philosophical orientation, and my strategy is empirical and holds a mainly interpretative epistemological orientation (Bryman, 2004; Remenyi et al., 1998). These means that through doing fieldwork I intend to find out how people interpret the world around them and how they act based on this interpretation, and try to understand their behaviour. As a student within the field of social research I believe it is important that the strategy I choose respects the differences between people and acknowledges that humans are individuals that interpret the social world differently and therefore acts differently in their daily lives. However my choice of methods "should depend more on the purposes and circumstances of the research than on the philosophical considerations" (Punch, 1998:240).

I initially chose to conduct qualitative research. One of the advantages with qualitative research is its flexibility. If certain experiences in the field makes one believe that it is efficacy to change or adapt the research plan, the flexibility of qualitative research makes it possible to do so (Holm and Solvang, 1996). This means that I could adapt my interview guides which I was using during data collection, or I could change my subject approach. It would even be possible to add a quantitative element in the form of a questionnaire regarding i.e. how local people have experienced and been affected by disasters. I was aware of this before I started my fieldwork, and actually ended up adding a quantitative element. Just because qualitative research implies a commitment to fieldwork, it does not imply a commitment to innumeracy (Kirk and Miller, 1986:10, in Silverman, 2001:35; Bryman, 2004:266).

My research may be described as something in between a multiple-case study and a cross-sectional design. I have used three different communities (cases) in different situations, which were chosen because they provide a suitable context for my research and the questions I seek to answer (Bryman, 2004:51). Case studies are very often inappropriately associated solely with qualitative research, but both qualitative and quantitative, or even a combination of different methods may be used when studying cases (Bryman, 2004). Further more "there are areas of overlap and commonality between them" as Bryman describes it (2004:453). The cross-sectional element refers to the questionnaire I chose to administer, and which provided me with current quantifiable data which could be compared between the three communities (Bryman, 2004:41). How ever the main and initial method of my research was qualitative; as it was my interpretation of the total amount of information and data I collected that has been the centre of this research. What I have been interested in finding out is how disasters have affected these communities, what disaster management functions are present and how they

can handle future disasters better. By taking advantage of the flexibility of qualitative research strategies and by using different cases and different methods, I collected unique information from each of the 3 communities, which again was compared and combined. When I combined all the information from the 3 cases I got my total amount of data which I organised and interpreted in relations to my main research questions.

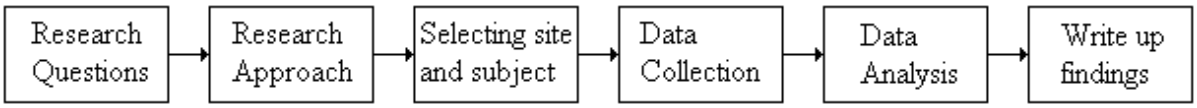
4.2.2 Research methodology

The *methodology* I chose in order to shed light on my problem describes a practical approach and sets the procedural framework within which I place my empirical findings so that they may convey sensible meaning (Leedy, 1989; Remenyi et al., 1998), and the specific *method* I choose is simply a technique for collecting the necessary data for my research (Bryman, 2004; Silverman, 2001). *How* I choose my method for data collection should follow from the questions I'm interested in shedding light on (Punch, 1998; Silverman, 2001).

As stated earlier I have an empirical strategy and empirical data may be quantitative, basically meaning numbers, or qualitative, meaning it is basically not numbers (Punch, 1998:4). Based on the context, circumstances and practical aspects of my research the method or methods I use when conducting research should be determined primarily by *what* I'm trying to find out. This means that substantive issues dictate methodological choices (Punch, 1998:61). When appropriate it is actually possible to combine the two types of methods in different proportions, and how we choose to combine them should also depend on context and circumstances. As well as common sense (Punch, 1998:250).

One way of combining the two methods is by incorporating quantitative methods into basically qualitative research (Silverman, 2001). "Counting techniques can offer a means to survey the whole corpus of data ordinarily lost in intensive, qualitative research" (Silverman, 2001:37), and this gives the readers a chance to get a fuller picture of the objects and situations researched, and not just trust the researchers interpretation and words. This means I have chosen to use a basically qualitative research strategy, but with a quantitative data collection technique incorporated. **Figure 4.1** outlines the 6 main steps of qualitative research, and the 4 steps in the middle are described closer in this chapter while the first and the final step is covered in chapter 1 and 5 respectively.

Figure 4.1 The main steps of qualitative research



Source: Bryman, 2004. Figure: Kim Øvland

4.2.3 Selection of study area

The Caribbean is an area where natural disasters are frequent, and hurricanes, storms, heavy rains, landslides and floods have devastating and mortal affects every year. Just in the Dominican Republic almost 1000 people have been killed and over 275,000 affected by natural disasters the last 10 years (EM-DAT, 2009) (see ch. 2.4). The area where I chose to conduct my research had to be accessible and at the same time suitable for my research. UiA

has an agreement with the Xstrata Nickel company to send students to the Dominican Republic and have them do research and fieldwork there. To me it seemed like an obvious and very convenient choice of location for my fieldwork. Bonao is located in the central highlands and is an area with many rivers and high groundwater, as well as a rather high amount of annual rainfall. The proximity to rivers and high amount of rain makes it vulnerable to hydrological disasters, and the poor population is very much affected.

The Bonao area is where the mainly Xstrata financed Fundacion Falcondo operates. This is a foundation that works on several important development issues such as education, health and environment. Fundacion Falcondo was my local contact in all practical matters and proved to be very interested and also supportive of my work. The foundation had no strategies or work related to my topic, but viewed it as a very relevant topic, and was actually looking at the issue of disaster management and local disaster support as a future area of commitment.

In the area around Bonao I chose 3 different communities (see ch.2.3.2 – 2.3.4). Definitions of community may vary and for the purposes of this thesis, I have chosen a simple operational definition. "A community is a group of individuals and households living in the same location and having the same hazard exposure, who can share the same objectives and goals in disaster risk reduction" (Victoria, 2002:271). The communities I refer to are different in the way that one is still living with risk, one is living in shelters and one has been relocated. The communities differ in size and the members may have varying perception on disasters and how to handle them depending on e.g. social class, education, age and gender (Victoria, 2002).

4.2.4 Research partner

As the local language in the Dominican Republic is Spanish and my knowledge of the language is very basic I foresaw that language might be an issue or obstacle regarding my research. I therefore asked Fundacion Falcondo if they could provide me with a local representative who could support me in my research and who spoke both English and Spanish, something which they did. Rafael Correa, who I through out this thesis refer to as my *research partner* provided me with invaluable help and support, was well educated and had a lot of local knowledge and know-how.

4.3 Qualitative research and data collection

In my research I have used three of the four major methods of qualitative research; interviews; observation; and text analysis (Silverman, 2001). The interview methods I used were both *semi-structured* and *unstructured*, and the observations I made may be described as *direct* (Salkind, 2009) or *structured* (Fink, 1995*a*:46).

4.3.1 Sample

All research involves sampling, because "you cannot study everyone everywhere doing everything" (Miles and Huberman, 1994:27). In my research I used what we can call three different communities affected by several disasters, as sites for my study. The latest major

hurricane to hit the people living in these communities was Noel in October 2007, and my research relates mainly to those affected by this hurricane. One of the communities I used was Palmaritos a small roadside community where some people lost their houses in Noel, but most still live in their houses and reside in Palmaritos. The second community was the shelters in Piedra Blanca. The people who lived here had lost everything and where now still 15 months after Noel living in shelters provided by the government. The third community was that of Campo de Aviaciõn where a multinational corporation with activities in Bonao had provided 21 housing units which had been given to people from the Bonao area whom had lost their houses. These three different communities where selected after I had consulted local organisations, e.g. Defensa Civil (see ch.2.4.2).Choosing my area and subjects for research in this way can be described as a non-probability and purposive sampling (Bryman, 2004:333). This is because it is necessary to interview people who are relevant to the research questions, meaning they must have been affected by disasters and have thoughts about what actions might be supported in order to better handle future disasters. This might mean that a sample of grown-ups is most sensible. The interviewees might have different backgrounds and shed different light on the issues of interest, and furthermore if they have experienced more than one disaster they may compare the different situations regarding disaster effects, preparations, how they handled them and how the recovery phase was. The number of interviewees will depend on access to people with relevance for the study.

I was able to get 10 in-depth interviews, plus a number of spontaneous interviews with the people in the three communities.

4.3.2 Semi-structured interviews

A semi-structured interview "seeks to obtain descriptions of the interviewees' lived world with respect to interpretation of the meaning of the described phenomena" (Kvale and Brinkmann, 2009:27). It is a research technique which is not as open as an everyday conversation or as closed as a questionnaire. The purpose of my interview is supported by an interview guide that helps me remember to cover certain themes and questions, but the interviewee chooses how to reply (Bryman, 2004). During the interview it is possible to supplement the interview with questions not included in the interview guide, but mostly I followed the guide from interview to interview. The semi-structured interview may reveal in-depth information and has a strength in its' flexibility, further more as I had a rather clear focus on my investigation I used semi-structured, as opposed to unstructured interviewing, since this gave me a better chance on addressing specific issues (Bryman, 2004:323). The interview guide followed a chronological path related to the disasters people had experienced, which gave the interview a good flow. The interviews were recorded.

Appendix 3: Interview Guide

4.3.3 Unstructured interviews

Conducting an unstructured interview is close to having an informal conversation (Punch, 1998:178), how ever I did have a list of some key words in order to try and get the conversation to cover my areas of interest, but at the same time making my questions open-ended. My unstructured interviews have typically started with *introducing questions* which gets the conversation started and then the interviewee can continue talking about what he/she

sees as relevant and important relating to the topic we are discussing (Bryman, 2004:320). The lack of a rigorous structure makes the unstructured interview a flexible method of collecting data.

I conducted unstructured interviews with people working in government bodies and organisations like PNUD (UNDP), Defensa Civil (DC) and the Red Cross, as they are amongst the most active actors within the field of DM issues. In UNDP I inteviewed the international coordinator stationed in Santo Domingo, who worked on issues related to local disaster measures. I also interviewed a UNDP field practitioner who was working on the implementation of a local disaster preparedness plan in the central region of DR. The head of the DC office in Bonao, who was former head of the national DC office, contributed with information on the work of the DC, and local risk. And I also talked to Red Cross volunteers working alongside the UNDP in the field.

4.3.4 Spontaneous interviews

By *spontaneous interviews* I mean conversations that have turned in to descriptions or discussions relevant for my studies. The topic of disasters and disaster management is interesting and also very much a part of peoples lives when living in Bonao and the Dominican Republic. This means many people have knowledge, opinions and suggestions on what to do and why things are the way they are. It's a very simple way of obtaining information and on several occasions I met people about whom I knew nothing, or at least wasn't aware of their knowledge relating to my research topic. But when I understood that this people could contribute something to my research, I would explain my interest in the topic and engage in a conversation or what might be called a spontaneous interview.

When I visited schools in the area conversations with people that where in some way associated with the school (teacher/pupil) provided me with interesting information and knowledge, through what might be described as spontaneous interviews.

4.3.5 Secondary data and text analysis

Information extracted from the work of others is secondary data. There are many different kinds of secondary sources; articles and syntheses of other work in the area, textbooks, the internet, government information, newspapers, summary statistics, etc (Salkind, 2009). I have used textbooks, articles and the internet quite extensively and also written information received from subjects and organisations which I have interviewed, e.g. PNUD, which is the Dominican UNDP office, and government documents.

Low costs, time saving, often high quality and large population accessibility are mentioned as some of the advantages of secondary analysis (Bryman, 2004; Punch, 1998). How ever analysing secondary data might not be straight forward as interpreting other people's data and even raw data there is a challenge in *making* it answer or fit your own research questions (Procter, 1996, in Punch, 1998:107).

4.3.6 Observation

Direct observation helped me create an understanding of the study setting and visually experience some of the problems facing the communities which are affected by disasters (Salkind, 2009). Without actually participating and merely observing the environment being studied I saw the obvious problems related to for example community locations its proximity to rivers, the strain on infrastructure by rivers and floods, and also different kinds of preparedness initiatives. It is important to observe such parts of the environment being studied in order to gain and understanding of what local communities are exposed to and how they are handling it. It might also be described as *structured observation* when I was out looking for the presence or absence of disaster preparedness initiatives or structures, e.g. concrete walls against flooding (Fink, 1995*a*:46).

4.4 Quantitative methods and data collection

The quantitative method I have incorporated is a *questionnaire* which was made based on preliminary observation (Silverman, 2001). The quantitative element supports the qualitative focus of my research and helps the readers of my research gain a bigger picture of the situation in the communities where my research have been conducted.

By adding a questionnaire I could test if the results from individual interviews represented the general attitude or perceptions. The questionnaire is also less personal, and with little interviewer interference, therefore through the questionnaires I could collect data which was less steered by feelings. Both the subjects' feelings and mine, something which could be a good idea as feelings are involved when one discusses people's losses. Further more the qualitative data I collected gave me subjective insights and opinions, but when one is studying communities with many members it is also interesting to get quantifiable information.

4.4.1 Sample

I used two small communities and one larger community as samples. The two small communities were the shelters in Piedra Blanca and the new housing area in Campo de Aviaciõn. Here I could more or less administer the questionnaire to each household in these communities. This means I got information from a very large sample of the population in these communities and it becomes easier to make statements about the whole population.

In the neighbourhood of Palmarito, which was the largest community I used as a sample, I had to choose a sample of the population as it was practically impossible for me to administer questionnaires to the whole community. In Palmarito I chose the women's group "Club de Madres la Inmaculada" as my sample which may be described as *purposive and convenient*, but also in line with UN suggestions to focus on women in disaster reduction through the International Decade for Natural Disaster (IDNDR) reduction which in 1995 focused on "Women and Girls: Keys to Prevention" (UN/ISDR, 2004; UN/ISDR, 2007*c*). Such non-probability sampling seems appropriate for my research (Fink, 1995*b*:34).

Table 4.1 Questionnaire responses

Questionnaire Session Response				
Community	No. of valid questionnaires	No. of rejected questionnaires	Total no. of 'households' in community*	Respondents-% of tot. no. of households
Palmarito	28	2	approx. 270	10 %
Piedra Blanca	29	1	32	90 %
Campo de Aviaciõn	21	1	21 houses, ca. 26 families	80 %

*The numbers from Piedra Blanca and Campo de Aviaciõn are collected in the communities by the author. The number from Palmarito is collected by the author and Dyveke Rogan, who was also conducting fieldwork in the Bonao area.

4.4.2 Questionnaire

I collected my quantitative data by using self-completion questionnaires. This is a method used when one is studying more than one case and collecting quantifiable data at a single point in time (Bryman, 2004:544). The design is *descriptive* or *observational* which means it produces information on already existing groups and phenomena, and I use 3 different *cohorts*, meaning 3 different groups of respondents that share an experience which is central to the objectives of my research; people affected by natural disasters (Fink, 1995:25).

In my questionnaire I avoided open-ended questions and tried to make the questions as salient and relevant as possible (Bryman, 2004:134) (see Box 4.1). At the same time most of the questions are easy to relate to the objectives of my questionnaire and research, hence they are *purposeful* (Fink, 1995*b*:13).

I administered the questionnaires to the participants in the three different communities and collected them back after they were completed. In this way I was in control of the data (Punch, 1998:10). Each questionnaire session took about 1 hour.

In Palmaritos we held the questionnaire session at one of the meetings of the women group "Club de Madres la Inmaculada". We had arranged in beforehand to come to the meeting, and had also attended a meeting prior to the meeting with the questionnaire session, in order to introduce our selves and prepare the group for our second visit.

Box 4.1 A relevant questionnaire

My research partner and I visited Campo de Aviaciõn a few times before we agreed with the 'vice-community leader' the time we should come back and carry out the questionnaire session. When walking through the small community of new colourful houses we approached one guy in his early thirties and his mother. We explained about the purpose of our visit, the topic of our investigation and the questionnaire. The guy and his mother listened with what seemed as a limited interest, but agreed to fill out the questionnaire as best as they could. We then walked on to the next house-owner and repeated for them the purpose of our visit and so on. Then when we had completed the round of handing out the questionnaires we walked around the small newly established community again and asked if there were any questions and collected the questionnaires that where completed.

When we came to the earlier mentioned guy and his mother, their attitude towards us had changed and their previously disinterest was gone. They were now very interested. The boy eagerly uttered his approval of the questionnaire and explained that the questions raised were very important and should be of great interest to everyone having experienced what they had experienced. He then more than willingly and without us asking started to tell about his family's and his experience regarding the devastations of hurricane Noel, and that the interest in their story and experiences should have gotten more attention. Yes, they had gotten new houses, and yes, they were alive. But life was still though…..

In the shelters in Piedra Blanca me and my research partner had visited and talked to the people three times prior to the visit when we held the questionnaire session. We had talked to several of the people personally and we got an understanding from the community leader that everybody in the shelters was aware of our research and wanted to contribute if they could. We agreed with the community leader on a time and date for our questionnaire session, and he informed the people living in the shelters. So on the day of the questionnaire session there was a group meeting in the open space outside the cubicles.

In Campo de Aviaciõn we had two visits prior to our questionnaire session. We had walked around the community and talked to people and the 'vice- community leader' was our contact person, and the one who helped us conduct our research. On the day of the questionnaire session he walked with us from house to house where we explained our research and the questionnaire, and handed it out and collected it at a later point.

Appendix 4: Questionnaire Piedra Blanca
Appendix 5: Questionnaire Campo de Aviaciõn
Appendix 6: Questionnaire Palmerito

4.4.3 Observation

Usually quantitative researchers argue that observation is not a very reliable data collection technique, how ever it might be used at the *exploratory* stage of research (Silverman, 2001:12). I used observation as a method in the preliminary work of the survey research, meaning I visited sights affected by natural disasters and made observations that gave me

ideas when making the questionnaire. I saw practical efforts to prevent flooding, e.g. walls made of care tires (see picture p.?), and destroyed houses next to houses that where still standing. Such observations gave ideas to my continued work and research.

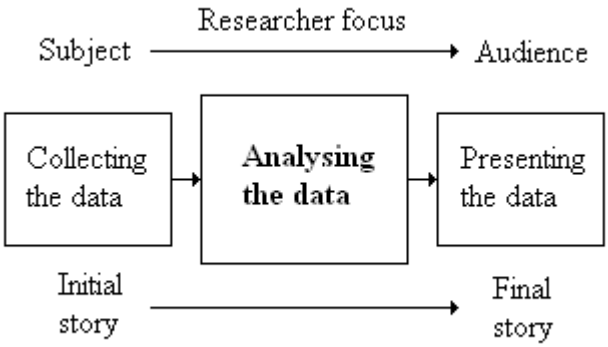
4.5 Data analysis

The methodological ideal relating to data analysis is that analysis can be undertaken during the research process. How ever there might be social and ethical restraints to this possibility, but the way to analyse the data should be considered before the actual data collection (Kvale and Brinkmann, 2009:190), and as fare as possible be a part of the research project from day one (Silverman, 2000). I have kept a simple diary where I daily made notes on my work and findings, and also structured these findings under thematic headings, e.g. 'early warning in the community' and 'ways to prepare', when possible. This way of structuring my daily research process will make it easier to get an overview of my data when the final analysis process is to take place.

When analysing data (transcriptions of interviews, observations, experienced situations and incidents, etc.) it is important that ones cultural categories don't come in the way (a category meaning our apprehension of objects and humans through our senses, mental abilities and culture), since the informant might not necessary use the same categories as the researcher (Aase and Fossåskaret, 2007).

The analysis of the collected data is the crucial stage between the initial story told by my interviewees and questionnaire respondents, and the final story I present for the audience (Kvale and Brinkmann, 2009). To analyse something means to separate and consider it in detail, and this is done before I present it for my 'audience'.

Figure 4.2 The data process



Source: Kvale and Brinkmann, 2009. Figure: Kim Øvland

4.5.1 Analysing qualitative data

The result of qualitative data collection is often a lot of unstructured information, as opposed to quantitative data which is organized in categories before the actual data collection takes place (Holme and Solvang, 1996). Due to my collection techniques the information will be

available in four different ways; (1) I will have notes from interviews and from observations, (2) recordings from interviews, (3) answered questionnaires and I will have (4) documents. Similar information from the different sources will have to be organized and connected, so that the complete material will shed light on my research problem from different angles.

As I have asked questions such as 'can you tell me what happened the night Noel reached your community' and followed up with 'and what happened the next day', I ended up with interview results that provides a narrative account (Riessman, 2004*a*, in Bryman, 2004:413). Thematic analysis is a narrative analysis model which emphasis *what* is said rather than *how* it is said (Reissman, 2004*b*, in Bryman, 2004:412), and it emphasises the stories people tell to account for events (Bryman, 2004:413).

4.5.2 Analysing quantitative data

I used a conventional *statistical method* to analyse the data produced by my questionnaire. This mean I organize and interpret the numerical data which may result in descriptions, relationships and the possibilities of comparisons (Fink, 1995*a*:53), e.g. comparing what the different communities define as most important when it comes to implementing disaster preparedness initiatives. Will there living situation make a difference in responses?
When summarizing the results of such a questionnaire session it is possible to create a total picture of the respondents experiences related to local disaster management.

The organizing will help me to present the data in an understandable and also visual way when I use figures and tables as a method of presentation.

4.6 Research challenges

While it is known that true objectivity, especially in qualitative methods, is more or less impossible, it is advised to acknowledge the biases in advance. I acknowledge my subjectivity as a researcher and have to the best of my ability limited bias interpretations and opinions. I was also aware of the challenges I might meet when facing a culture and language different from my own. This might concern all aspects of my research, however my preliminary work helped me gain knowledge and information about the subject and the area of study.

4.6.1 Foreign Researcher and Language

A major challenge for my research was that of language, as Spanish is the language in the Dominican Republic and my Spanish is limited as I am a foreigner. However to increase the accuracy and validity of the research I was supported by Rafael Correa when conducting interviews, who had Spanish as his mother tongue and also spoke English. He was provided by Fundacion Falcondo. This of course raises the issues of translation, which were overcome as best as possible.

4.6.2 The Interview

When interviewing people who have experienced disastrous or traumatic events it seems obvious that the interviewees' feelings as well as the interviewers' empathy might influence the interview process and outcome. It is therefore important not to be credulous and accept everything at face value as answers might be steered more by emotion than actual facts (Kvale and Brinkmann, 2009:295). It is important to maintain a critical attitude as a researcher, even if there is knowledge potential in feelings and empathy (Ellis and Berger, 2003, in Kvale and Brinkmann, 2009:295). Many of the people I spoke to had saddening stories of family members who died, and children they lost in the food. Some cried when they told their stories. In such situations it is impossible to stay 100% objective, but I tried to limit my subjective feelings even if there is knowledge potential in my empathy.

4.6.3 The Questionnaire

When using a questionnaire a researcher avoids *interviewer effects*, but usually faces the problem of not being able to support respondents if there is something that they don't understand when answering the questionnaire (Bryman, 2004:133-134). I how ever avoided the prompting problem by being present at the questionnaire sessions, together with my research partner. This meant we were two research representatives present able to help respondents; my research partner who had Spanish as his native tongue and me how had designed the questionnaires.

One problem with conducting questionnaire sessions relates to the respondents familiarity with answering such a questionnaire. It seems as if younger people are more familiar with the use of questionnaires, as it is notable that the people closer to the age of 20 are seemingly more comfortable with the questionnaire format than people closer to the age of 60. I make this presumption as the marking of answers by the younger group is more in line with the instructions given and the concept of answering a questionnaire, while older people have in many examples written "yes" or "no", instead of just ticking the square in front of the alternative "yes" or "no". The reason for this can maybe be related to the level of education. This happened despite the fact that we explained how to answer the questionnaire before we handed them out; in Palmaritos and the shelters in Piedra Blanca we did it in plenum, while in Campo de Aviaciõn we explained to each of the respondents individually.

4.6.4 Validity, reliability and generalization

The research instruments or methods I have used to collect my data must assess what they purport to measure if I am to claim *validity* for my research (Bryman, 2004; Fink, 1995*a*). My interviews and questionnaire focus on the subjects experiences relating to disasters, e.g. affects and how they handle living with risk, and this is this is valid in regards to my research questions (see ch. 1.4).

I have tried to make my research as reliable as possible by for instance being present at the questionnaire session so that people could ask me to explain if there was something they didn't understand. How ever even if I tried to make the questionnaires as understandable as possible the reading level might have been a bit high for some of the respondents (Fink, 1995*a)*, e.g. one respondent asked me what 'vulnerability' means.

Another issue which should increase the reliability of my research is that the respondents were in general very interested in the topic and wanted to answer my questions. How ever at the same time it is possible that some of the respondents were *a bit to eager to respond* and gave me the answers they thought I wanted or answered in a way that describes a picture of their situation that is even worse than reality because they see the opportunity to get sympathy and maybe even help, as they are in a though situation.

If the findings from a research project are found to be reasonably reliable and valid, the question of *generalisation* remains; are the findings primarily of local interest or can they be transferred to other places, subjects and situations (Kvale and Brinkmann, 2009:260). As I have not studied disaster topics in other than the 3 communities presented in this thesis it is impossible to say with certainty whether my findings here are transferrable. How ever the issues relating to e.g. local preparedness and knowledge of disaster prevention could very well be relevant in other places affected by natural disasters, as there are many organisations and people working on these issues in disaster ridden areas around the world.

4.6.5 Ethical challenges

The research I have conducted may be described as evidence collection through fieldwork and the help of informants (Remenyi et al., 1998:229). Mainly through interviews and questionnaires informants and participants have shared their experiences, information and knowledge. Prior to my interviews and questionnaires I gave them assurances relating to why I was doing this research and how I would process the information collected (Sekaran, 1992, in Remenyi et al., 1998:229).

Confidentiality and anonymity was upheld, and I described to all the respondents the objectives of my study and that they should not have any false hopes about what my research could achieve. This relates especially to the people living in the shelters in Piedra Blanca as they thanked God for the presence of my research partner and me, since it was very seldom that people paid attention to and cared about their situation. Extra precaution has been taken regarding the use of direct quotes in order to protect the identity of respondents. When quotes have been used permission has been sought or names changed.

4.7 Fieldwork reflections

Conducting research in an unfamiliar society and environment has its challenges, as manners, customs and believes might be different than what you are used to. Also people in other and poorer societies than the one you come from may have experiences so different from the experiences people in your society have. Experiences that might sadden you, surprise you or anger you. Further more the research topic might include sensitive subjects which raises emotional and ethical problems.

One challenge was I met during my fieldwork is related to the topic; how disasters have affected humans life. People have experienced terrible losses and share their stories with a tear in their eye. Keeping an objective focus isn't always easy in those situations. A couple of

times I had to go outside my comfort zone when I asked follow-up questions to answers that included people dying.

The topic also very much revolves around disadvantaged groups, and when coming from a very privileged society like I do, the societal differences between me and my subjects may create some barriers. Or expectations. When relating to the people in the shelters it was sometimes difficult to know whether people were telling the whole truth or altering certain aspects of the story. Were they maybe telling me what they wanted me to believe? Or were they telling me what they thought I wanted to hear? So I would give them sympathy. Or other things… The reason for this dilemma regarding the sheltered families is that the stories about why they where there varied. Some believed and claimed that those living in the shelters were lazy, and wanted new houses for free. Some of the neighbours to the shelters threw rocks at the shelter roof at night, showing their dissatisfaction with the unnecessary presents of the cubicles.

After quite sometime it became clear that there were people who tried to take advantage of the terrible situations presented by disasters. After e.g. Noel people came to the Bonao area from other parts of the country which was not as badly affected, and claimed they had lost their house. They would do as an attempt to get a free house or other kinds of support from the government or other donors. People were caught doing this when the police wanted them to show where their destroyed house had previously been located. And they couldn't.

For me personally it is hard to not believe people who share their stories, like they did in the shelters. And I have to the best of my ability analyzed the information they shared and presented it in this thesis.

Chapter 5 Findings and Discussion

5.1 Introduction

In this chapter I present my empirical findings from 2 months of fieldwork in the area around Bonao, in the Dominican Republic. I relate my findings to existing literature and discuss and analyze what I perceived as the local situation. My perceptions and findings are based one the data I collected through interviews and questionnaires, as well as my total experience of the time I spent in the field. I start by presenting the three different communities in different sections before I do an analysis of the total dataset. As a reminder my research questions revolves around disaster impacts in the communities, the presents of DM systems and in what ways they have recovered. Further more I wanted to seek people's opinions on disaster reduction, and how it might be possible to be better prepared before the next natural hazard event occurs.

Vulnerability is one of the key determinates of disaster (Alexander, 1997) and often correlated with underprivilege (Blaikie et al., 1994). Related to my research questions which focus on effects and the possibilities of reducing effects of natural disasters in poor communities, vulnerability is a central element. "Innumerable variables are interacting to produce a future of increased vulnerabilities" (McEntire, 2001:191), and in order to answer my initial research questions it seems necessary to discuss the different categories of vulnerability related to the communities I have studied.

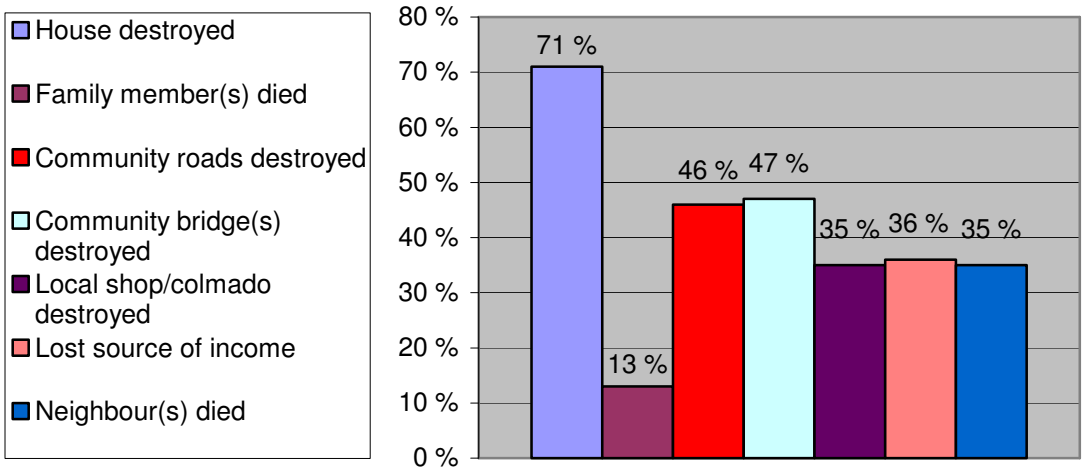
There is a connection between how we treat the environment and the occurrences of disasters. However for poor people living in small disaster ridden communities reducing the occurrence and intensity of natural hazards might seem like an impossible task. But the possibility of minimizing the effects of such hazards can be done locally and should be focused on by small communities. Reducing the effects is done through reducing vulnerability as damage from a disaster event is the result of vulnerabilities that existed prior to the event (CGCED, 2002*a*).

As for the general public many people are poor and vulnerable to the hazards presented by natural events, but their total vulnerability level (Alexander, 1997) makes them focus more on socio-economic issues rather than potential floods. Their knowledge of disaster reduction benefits is still lacking, or else they would probably know that different kinds of vulnerability are linked, and natural hazards potentially increase their vulnerabilities.

During the time when I was conducting my fieldwork disasters struck just north of my research area. Heavy rains, flooding and landslides killed several people, displaced more than 15,000 and destroyed more than 3,000 houses (Acosta and Pimentel, 2009; Guzmán, 2009; Laureano, 2009). Through the newspapers one could read that government plans and management related to such incidents as the ones that were prevailing, were less than satisfactory.

5.2 Affected communities

Figure 5.1 How did the last major disaster affect you and your community?



For my subjects in the three communities the last major hurricane whose impacts were in many places still visible when I was there, was Hurricane Noel in October 2007. This hurricane impacted the area around Bonao hard and demanded many casualties and created great devastation (see **Figure 5.1**).

The three communities I studied all suffered enormously from Hurricane Noel, but the amount of impact varies significantly. I chose the three different communities because they represented different outcomes of the same threat. For me to say exactly what their most crucial pre-disaster vulnerabilities were is impossible, but it is safe to say that probably had different levels of vulnerability, hence the impacts varied.

People living in this area have experienced several disasters, of different magnitude. The occurrences of natural hazards which never become disasters but inflict on the daily lives of the local people are frequent, and therefore some kind of impact from natural events is to be expected and a part of living. However, much due to the relatively high level of vulnerability and there disaster complacency, impacts of natural hazards and disasters are more devastating than they need to be.

As **Figure 5.1** shows most of the people who took part in my research lost their houses and everything in it. For some loosing their house and "everything in it" doesn't necessarily lead to life altering consequences. Substantial amounts of the people living in the high-risk areas around Bonao are poor, and the task of rebuilding their houses and retrieving new "household items" is not that much more serious than what they usually do. This means that some people simply view natural disasters as just that; natural. So when e.g. a hurricane hits and they are able to get away, they stay away, usually with relatives, until it has stopped raining and the river has retracted. Then they return to the location of their former home and rebuild. It's a continues task, like so many other tasks in life. Natural hazards have always been around, and they will always impact. But how much do they have to impact?

In Figure 5.1 we can see that personal and societal damages were substantial for all the subjects in my research, in the following sections I will go further into each community as there are obvious differences in experienced affects.

5.2.1 Palmarito

Palmarito
-
At risk

Photo 5.1: Kim Øvland, 2009

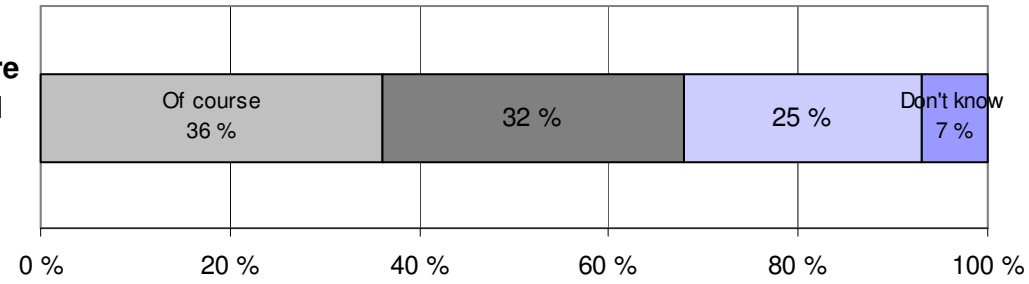
> *"I thank God and the Virgin that the bridge's armoured steel was stolen, so that when the flood came the bridge collapsed and couldn't function as a damn for the floating debris which would have flooded the community even more."*
>
> "Sandy", 28, Palmarito

Palmarito is the only one of the three communities I study were the people are still living in their pre-Noel locations. In the community I used the women's group "Club de Madres la Inmaculada" for my research, and they stood out as a strong organised group with a strong sense of community feeling. By this I mean that the women had confidence and felt empowered through their organisation and accomplishments. These two factors; that they still have and live in their "old" community and that they are part of a vital women's group, are probably part of the reason why the people living in Palmarito stood out as more "positive" and "in control" related to disaster issues, than the two other communities I studied. For instance 68 % of the questionnaire respondents answered that they were more or less aware of the natural hazard risk facing their community (see **Figure 5.2**), as opposed to 31 % in the shelter in Piedra Blanca.

Most people in Palmarito gave the impression that they tried to reduce risk and their own vulnerability, more so than in the other two communities. This might be one of the reasons that the impacts of Noel were less devastating here. Fewer people lost their houses and fewer people died, but the infrastructural damages (roads/bridges) were pretty much the same here as in the areas were the subjects in the other two communities came from. In Palmarito one of the women who did loose her house was Señora Ramona (see **Photo 5.2**; Ramona shows how high the water level was on her house before it go destroyed). The private organisation Fundación Falcondo is paying for the materials to build here a new house, and members of the community are building the house for free to help out a neighbour.

Photo 5.2: Kim Øvland, 2009

Figure 5.2 Were you aware of the natural hazard risk facing your community?



"Of course we know about the risk, flooding and heavy rain is normal here!"

In Palmarito DC (Defensa Civil) had helped them identify risk, and 90 % of the respondents emphasised the importance of preparation. There was a strong belief in the idea that both public institutions and private organisations/NGOs could contribute in an effective way regarding community preparation. As for the three disaster reductions measures of EWS, emergency management systems and risk reduction committees, these were unknown to most people in the community. Though in the questionnaires 1/3 answered that a EWS existed, however none of my interviewees could tell me about EWS'. This is an example of how aspects of a community might not be revealed through a small number of personal interviews, but become known through questioning a larger group of people through questionnaires. As for the EWS 1/3 referred to in the questionnaire, this is probably the community warning system the DC issue prior to anticipated natural hazards. In the interview with the head of the DC in Bonao I was explained that the DC drives around to the different high-risk communities and warns the public about the coming hazardous event. The out reach and effectiveness of this type of EWS, is unknown to me, but probably has its limits, as only 1/3 of community members in Palmarito are aware of such as system.

Regarding the issue of preparation, an overwhelming majority viewed education about disasters and preparedness, as well as the strengthening of people's emergency management capacity as the most important ways to increase people's preparedness. As for recovery and support after Noel most had been provided by private enterprises/organisations or foreign donors. The local government was not described as an important contributor in the post-disaster phase, and most people stated that the authorities did not listen nor pay attention to their needs. Only 7 % had faith in politicians.

5.2.2 Piedra Blanca

Piedra Blanca
-
Sheltered

Photo 5.3: Kim Øvland, 2009

"The real disaster is living in these shelters."

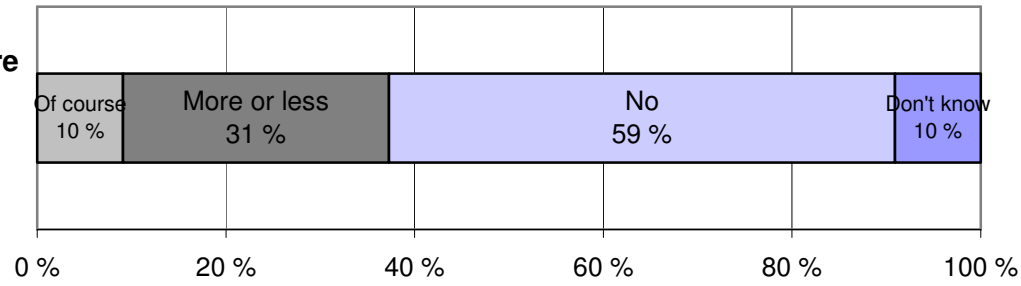
"Marta", 44, Piedra Blanca

Fare more people in the shelters in Piedra Blanca (PB) than people living in Palmarito answered that they weren't aware of the risk presented by hazards (see **Figure 5.3**). This can be related to different things. In the shelters people are in a terrible situation, and have lost everything they own. If they were really aware of the risk, would they have stayed and *risked* loosing all that? At the same time they want to change their terrible situation and there for it might seem wise to present your self as a "victim"; you didn't know anything about the risk, hence you could not prevent getting in this situation, and now really need help getting out of a terrible situation.

If the people living in the shelters in PB due to their total vulnerability felt that disasters were less salient problems before they came to the shelters, than disaster issues surely haven't become more salient now. Like "Marta" says living in the shelters is a 'disaster', and other daily 'threats' are given less attention than that of handling life in the shelters.

The stories told by the people living in the shelter were often tragic. People had lost family members (17 %), neighbours (62 %), and one man had actually been forced to let go of one of his children when he was in the flooding river and could not hold on to both of the children he had in his arms. People had terrible experiences from the night Noel occurred, and the situation they were in when I conducted my fieldwork wasn't much better. The living conditions in the shelter and the cubicles are hard to imagine for people living in developed countries. Elderly people sleeping on the floor, 7 people on 12m² and close to no privacy. I can hardly imagine that people chose this, if there is any other way to live. However as I mentioned, there were people who claimed so.

Figure 5.3 Were you aware of the natural hazard risk facing your community?



"We knew the river could overflow, but not that it would rise more than 4 meters above normal level!"

Regarding the situation in the communities were the people in the shelters came from and lived prior to the occurrence of Noel, 1 of 3 said that they tried to reduce risk and vulnerability. This relates well with the low number of people who said they were aware of the risk natural hazards presented to them. The people in the shelters, just as the people living in Palmarito, acknowledged the importance of preparing, but only 38 % responded that they had their community had gotten help to identify risk. As for the implementation of preparedness measures most people placed their trust in NGOs or foreign organisations. The distrust of the government was very evident in the shelters, as they blamed the government for the terrible situation they were in. It was the governments responsibility to provide them with new houses, and we were actually shown a cluster of newly constructed apartments where no one live. The people in the shelters claimed that these houses were built for the purpose of providing victims of Hurricane Noel with new housing, but that the government did not hand them over. Why? One assumed reason was that the politicians were waiting until election time next year, than a hand-over of the houses would be able to provide seated politicians with votes, publicity and support. Providing for the poor and les fortunate gives credit and 'buys' votes. Another reason was that there were actually more homeless people in Piedra Blanca waiting for government provided apartments, than number of available apartments. Hence the government was trying to wait-out the people who were waiting for a new apartment. Just as the people in the shelter didn't trust the government, the government didn't trust that the people couldn't change their own situation and had other possibilities then to stay in the shelters and wait to be provided for. This lack of trust between citizens and authorities is a major problem, especially when ne is working with issues and problems with multi-level relevance.

When asked about existence of EWS, EM systems and risk reduction committees in their former communities the large majority had no knowledge. Actually only 3 % were familiar with some sort of EWS. This does not support the efficiency of the EWS referred to by the DC. And that is probably why the people in the shelter emphasised EWS as the most important way to reducing the affects of future disasters. People hadn't been warned about the hazard which occurred so quickly, if they had then lives could have been saved. Disaster education as well as better communication with the authorities was also viewed as important aspects of the improvement of community preparedness.

For the people living in the small cubicles the issue of recovery is a difficult one. They have survived the disaster, but by no means recovered to a standard of living equal to that which they had prior to Noel. They ad whoever gotten different kinds of support after Noel and during the time they had spent in the shelter. The first 3 weeks after the disaster the media and practical support was very present, and then it declined gradually. After 3 months there was close to no external support. The support they have actually received after the first period has been mostly from foreign donors or NGOs.

5.2.3 Campo de Aviaciõn

Campo de Aviaciõn
-
Relocated

Photo 5.4: Kim Øvland, 2009

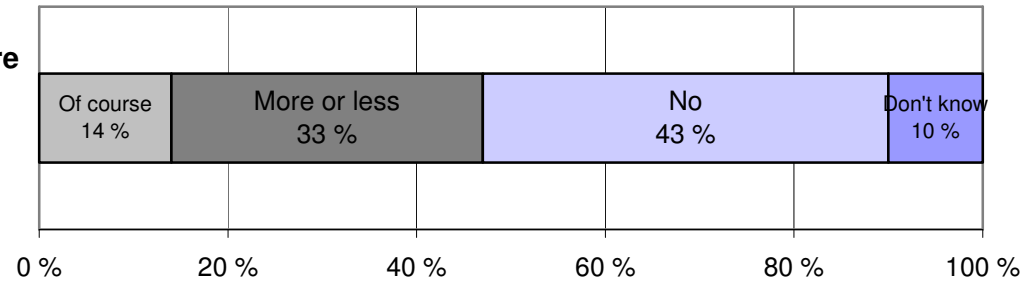
"I dreamt that I was peeing my pants, as I felt wet. But than I realised I wasn't sleeping, and the wet that I felt was not urine, but water which was flooding my bedroom and lifting up my bed."

"Manuel", 66

Campo de Aviaciõn meant a new begging for the people who had lost their houses in Noel, in a new community. But without the network and social safety nets that existed in the community where they used to live. This was a problem for many of the people living in Campo de Aviaciõn. This is an understandable problem as social networks are important for the well being of human society and particularly in many poor countries, where for instance public services are limited and you have to rely more on your neighbours and community for support. I can easily imagine reduced life-quality for many of the members of the women's group in Palmarito if they were split up and moved away after an event had forced them to do so. Also in Campo you got a feeling that the community was some what artificial; the row of colourful houses in the middle of an old air-stripe certainly lacked a feel of real community. It seemed as if people needed more time to really come to terms with the very new and also permanent situation. The shelter period is terrible, but limited, so you have a goal of leaving the situation. When you come to a place like Campo it is probably overwhelming and the answer to all your problems at first, but then reality kicks in. This is your new life. And it is not as good as the one you had before. Getting a new house isn't everything. Once you have satisfied one need another turns up. But of course there was also gratitude for having been given a new house. But people missed having electricity.

The people now living in Campo came from different high-risk areas in the area surrounding Bonao. Half of them claimed they knew about the risk and that they tried to reduce their own vulnerability.

Figure 5.4 Were you aware of the natural hazard risk facing your community?



"You have to live with the risk if you have nowhere else to go."

In their former communities risks had been identified by the help of outside assistance 57 % of the people now living in Campo, claimed. And as you can see from **Figure 5.4** almost half of the people new about the risk their former community was facing. The puzzling thing about this community though is that 24 % of the questionnaire respondents say that they don't think it's important to prepare, and another 10 % say they don't know if it is important to prepare. This might relate to the complacency issue, meaning that there are other issues more important to focus on than disaster preparedness, especially since they now have moved to a new location which is safe. Or at least safer than were they came from, and I believe many of the residents in Campo don't view natural hazards as he most salient problem. They expect their new community to be safe, or else a private company wouldn't invest large amounts of money to build houses there.

Regarding whom the people living in Campo viewed as most suited to help them prepare NGOs and foreign organisations had biggest support. In addition the 40 % regarded themselves, the community members as an important actor in the effort to prepare the community for disasters. This number is quit higher in Campo than in the other communities. As for the issues of DM measures present in their former communities, the people of Camp had pretty much the same answers as the other two communities; most people had little knowledge about the existence of efficient EWS', EM systems or risk reduction committees.

When it came to what they viewed as the best was to create better preparedness, the people in Campo placed equal emphasis on education, communication with the authorities and EWS'. These three ways to reduce disaster effects are what people have most faith in. Something which they don't have very much faith in though is politicians, local authorities and the government, while foreign organisations and private companies are given most of the credit for their recovery. This is of course natural as the houses they have been given were provided by a private international company.

5.3 Community vulnerability

As mentioned earlier disasters are less salient problems for poor people than for people who are not so poor. The reason for this is poor people's higher *total vulnerability* given their "precariousness of life in general" (1997:292), meaning they consider that e.g. socioeconomic problems are more important than e.g. flooding. At the same time they might view it as impossible to prevent or stop a natural hazard from occurring. But they can to a great extent determine their own vulnerability (McEntire, 2001). Vulnerability might increase for many reasons; hence there are many ways to reduce the overall vulnerability of a community. Community members can to a large extent reduce their own vulnerability. Our maybe outside assistance is necessary. What is important is that the work to reduce vulnerability is viewed as a long-term project, with follow up for lasting impact on vulnerability reduction.

5.3.1 Social vulnerability

It is interesting to note that from an academic and professional point of view (UNDP) it is suggested that people must be more educated on the topic of disasters and disaster management, but at the same time you met the opinion that people are aware of the risk their communities are facing, at least according to DC, people in the Bonao area new about the risks. How ever when going through the questionnaires answered in the 3 different locations most people answer that the best ways to prepare for future disasters are through educating people on disasters and disaster prevention and preparedness, as well as increasing the people's knowledge on disaster management. According to the CGCED discussion draft from 2002 (2002*b*:73) the Dominican Ministry of Education has included hazard and vulnerability reduction information in school curricula. This was not used or available at the schools I visited.

In order to reduce social vulnerability local knowledge is needed, hence the work to reduce social vulnerability very much includes the participation of the community members. Many of the subjects in my research claimed they were already working to reduce their own vulnerability.

The aspect of social safety nets has to do with social vulnerability, and as mentioned when people get moved or offered houses in new location, as your old community is destroyed than your social vulnerability increases as the social network you used to have is gone. For the people in Campo de Aviaciõn and in Piedra Blanca this could be a problem.

5.3.3 Political vulnerability

Poor people's access to political power and representation is limited. In my research that is reflected through the people's general lack of trust in the public sector and the politicians. As the authorities are said to provide little support both pre- and post-disaster, the people in my research have substantial political vulnerability. This can be reduced if their access to decision making bodies increases, for instance if people with power take an interest in their situation, or for instance when other actors can provide the functions which the political and public system doesn't.

Poor people's political vulnerability is also probably temporarily reduced around elections, when politicians "listen" to them, and show their moral side to the voters.

In parts of the DR highlands where people live in close proximity to rivers which are beneath dams or water reservoirs, the government demonstrates a case of poor people's political vulnerability that contributes to the already existing total vulnerability of the poor by increasing the *delinquent vulnerability*. "Delinquent vulnerability occurs when safety norms, codes and regulations are flouted or ignored" (Alexander, 1997:292), and this is the case when the government ignores to warn people when the dams are opened in order to let out water or for instance when building codes are ignored and a construction is built in a way which can not withstand a natural disaster.

5.3.4 Economic vulnerability

The people living in the three communities I studied had limited access to resources, and no one said they had insurances. This is linked to their economic vulnerability. The people in Piedra Blanca and Campo de Aviaciõn, and e.g. Senõra Ramona in Palmarito all had limited resources, and that's why they were dependent on others when the disaster was a fact. Everything gets lost, and nothing is easily or automatically repossessed. That is why people are forced to stay in shelters as their possibilities are limited due to limited access to e.g. financial resources.

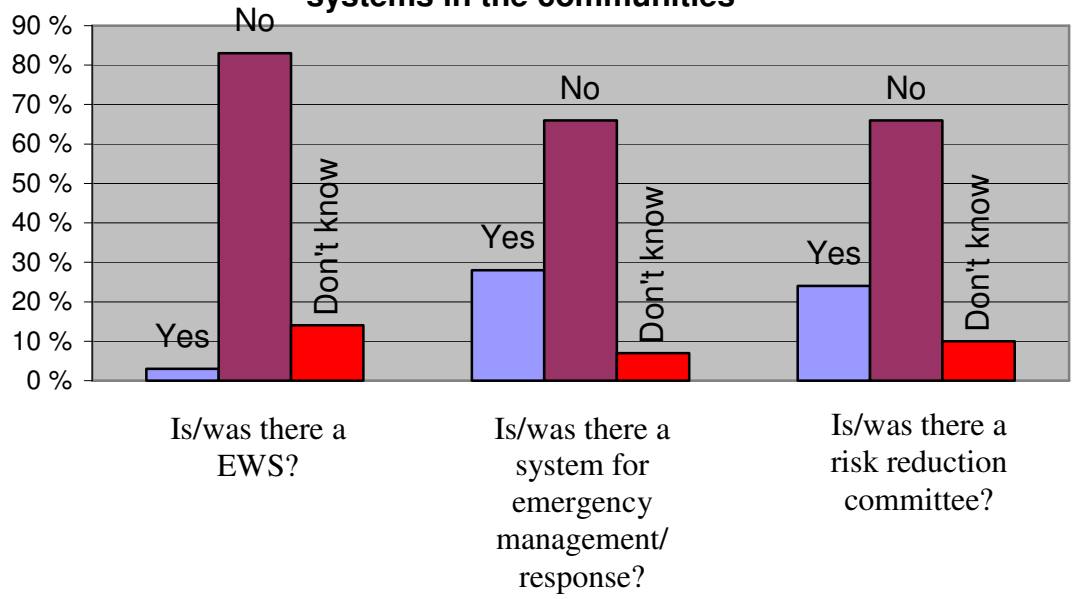
5.3.5 Physical vulnerability

Physical elements and infrastructure are variables that might reduce or create vulnerability (McEntire, 2001). And in all 3 communities the proximity to rivers as a triggering agent to disaster is obvious. Such hazard prone locations increase the physical vulnerability. A problem in the DR is that communities are not well enough organized to prevent further settlement in hazard prone areas (CGCED, 2002*b*).
Further more the building structures of much of the housing is less than adequate when it comes to withstanding a serious flood. Another problem related to physical structures is the inadequate planning of erection and foresight related to future stress.

The strength and resilience of the present infrastructure is of course an issue when discussing the affects of natural disasters, i.e. a flood or an earthquake. Usually what is preferred is infrastructure which can withstand strong impacts and support people in the time of extreme strain and assure that at least the infrastructural developments of local communities aren't totally destroyed or too much affected by the atrocities of natural disasters, how ever there are examples where too much infrastructural strength is unwanted. One example is where the lack of a "strong enough" bridge in Palmarito actually was torn down by the flood and therefore didn't function as a dam when debris came floating down the river, and overflowed the community even more.

Three ways to reduce vulnerability is provided by EWS, EM systems and risk reduction committees. The latter is a good way for a local community to take action and get involved in disaster reduction activities. The presents of these disaster management aspects were unfortunately limited as you can see in **Figure 5.5**.

Figure 5.5 The presents of disaster management systems in the communities



5.4 Handling and recovering from disaster

Figure 5.6 What do you believe is most important for your community in order to better handle future disasters?

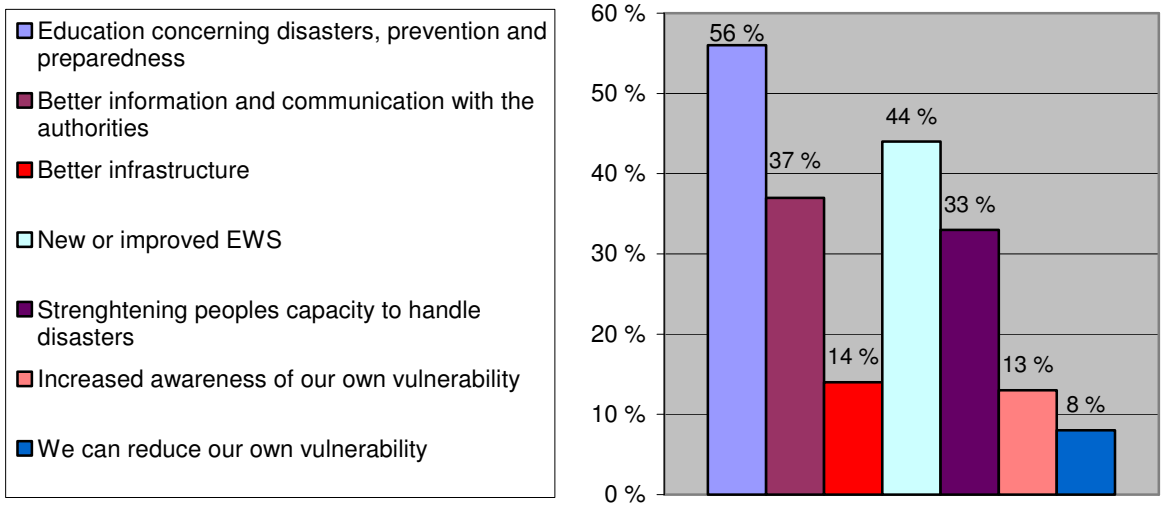


Figure 5.6 shows that education concerning disasters, prevention and preparedness is what people view as the best way to better prepare local communities for future disasters.

Regarding the question were I asked if people were aware of the natural disaster threat which their community was facing many answered no, claiming that they didn't know what risk living in a shed house close to a river in an area frequented by hurricanes. This might seem a bit strange or ignorant, but I believe it is important to be aware of the hurricane in mind, namely Noel. This was a very devastating hurricane with tremendous force and it might be

hard to be aware or even imagine such an enormous threat in advance. I do believe that people know that there is a risk that their community will be affected by hurricanes and flooding (most people answer yes), but that the consequence of the risk turning into disaster might be un thought of for those of the interviewees answering no to the threat question.

What kind of disaster reduction support people needs and wants demands on which community they come from, or now live in. In C.A. for instance the people have just settled down in new houses, provided by a private company. While in the shelters in Piedra Blanca what they want the most is a new house. In September 2007 the people in these two communities were in the same situation; having been sheltered for 10 months. Now there is a major difference between what the two communities want and need, due to contributions from a private organisation. And dissatisfaction is present in CA:

"At least in the shelters we had reliable electricity."

"Jose", 32

Through the questionnaires it seems like people would have more confidence in a non-government or foreign organisation helping them prepare or manage disasters. This is probably related to the issue of trust, as there is generally very little faith in the public systems and the politicians. Affected people expect the government to provide them with necessary assistance both in the pre- and post-disaster phase, how ever the actual support from government bodies prove to be less than satisfactory, hence people tend to have more faith in organisation without ties to the public system and rather see them come from abroad.

Another situation where the public sector doesn't live up to the expectations is when they fail to warn adequately. As failed warning creates distrust (see Box 5.1)

Box 5.1 The story of the Tsunami in the DR

Some of the devastating consequences related to hurricane Noel can be explained by the lack of well functioning warning systems and distributed information. Through interviews it has become clear that people weren't adequately warned about the magnitude of Noel. Whether they resided in Santo Domingo or the Bonao-area, the government failed to warn them properly, and actually wrongly informed the population about the strength and possible effects of the hurricane. People were told to stay calm, that there was no need to panic and that the hurricane was less devastating than it actually turned out to be. This wrong information from the government produced the effect that people lost trust in the government as a source of information and warning related to natural disasters. This is why 'the story of the tsunami' becomes interesting.

After Noel had occurred, a rumour started going that some one working at the national metrological centre had observed that a tsunami was building up and headed for the DR. People just having experienced the devastation of Noel, did not take lightly to such rumours, hence they started to panic and ran out into the streets as rumours spread, some even in their underwear. The government knowing that this was wrong in formation and that no one at the metrological centre had produced any tsunami warning, again tried to calm people down and tell them not to worry. And even though this was the right information, people did not trust the government after their incorrect Noel warning, and people therefore didn't listen, and continued preparing, evacuating and acting as if a tsunami was coming. Eventually people understood that no tsunami was approaching and calmed down. But this shows that people had lost trust in the public system as informant related to natural disasters.

The story goes that the rumour of the tsunami started with a sleepy employee at the metrological centre had some how misinterpreted and shared some information. Information originating from a dream…

5.6 What about the next disaster?

5.6.1 Do people talk about the next disaster?

Through the questionnaire sessions and after having gone through the results, as well as interviewing people it becomes fairly clear that they view preparing for future disasters as important. In order to reduce the impacts, physical and mental, and save lives they acknowledge the need to be aware of the risk they are facing and try to prepare for what disasters that will inevitably hit their communities. How ever the previous major disaster as well as future disasters is not a discussion topic in the community.

Why aren't people talking about Noel or future disasters?

1. They are tragic incidents with devastating and traumatic affects, which makes it though to talk about and is better left alone.

2. Natural disasters is not something special or uncommon, it is a normal topic and a part of everyday life and sometimes conversation, and therefore it doesn't get special attention, nor focus.

3. Amongst many people there is not a particular belief that there is anything you can do to prevent the inescapable occurrence of hurricanes. Hurricanes are now even more unpredictable than before, due to the changing climate.

4. Even though people have experienced the same disaster, their experiences are different. Some people lost their house or a child, while others just needed to get some new furniture. This might make it an "unfair" or unpleasant topic, which people avoid.

5. Finally people might fear the next disaster and believe that there is nothing they can do to be prepared for such an event as Noel was. Hence they avoid talking about it in order to control their fear, as talking about it will only increase the fear

5.6.2 Will people prepare?

Through interviews and the questionnaires it is evident that the majority of people living in the communities acknowledge the need to prepare; preparing is important. How ever this will not happen over night, and probably not without some kind of formal initiation of programs or awareness campaigns. Peoples complacency, the lack of culture for prevention, limited knowledge, as well as very limited political interest in the subject makes people passive in relation to disaster reduction issues.

5.8 What about local community – private organization collaboration?

Private enterprises, NGOs or foreign organisations may support poor communities in different ways. Creating local business that serves the needs of the community and provides employment, hence reduces economic vulnerability and indirectly affects disaster reduction, is one way. Another is by implementing context specific projects directly aimed at reducing disaster affects.

The results from a natural disaster are often overwhelming physical, emotional, and spiritual devastation. But through collaboration between organizations and local community agencies and out-reach to the community as a whole, new relationships with individuals and groups in a disaster ridden area may be forged, and the possibility of preparing and managing a disaster might increase. This might be especially important in communities where former social networks and safety nets have been destroyed by disasters; hence the social vulnerability is increased.

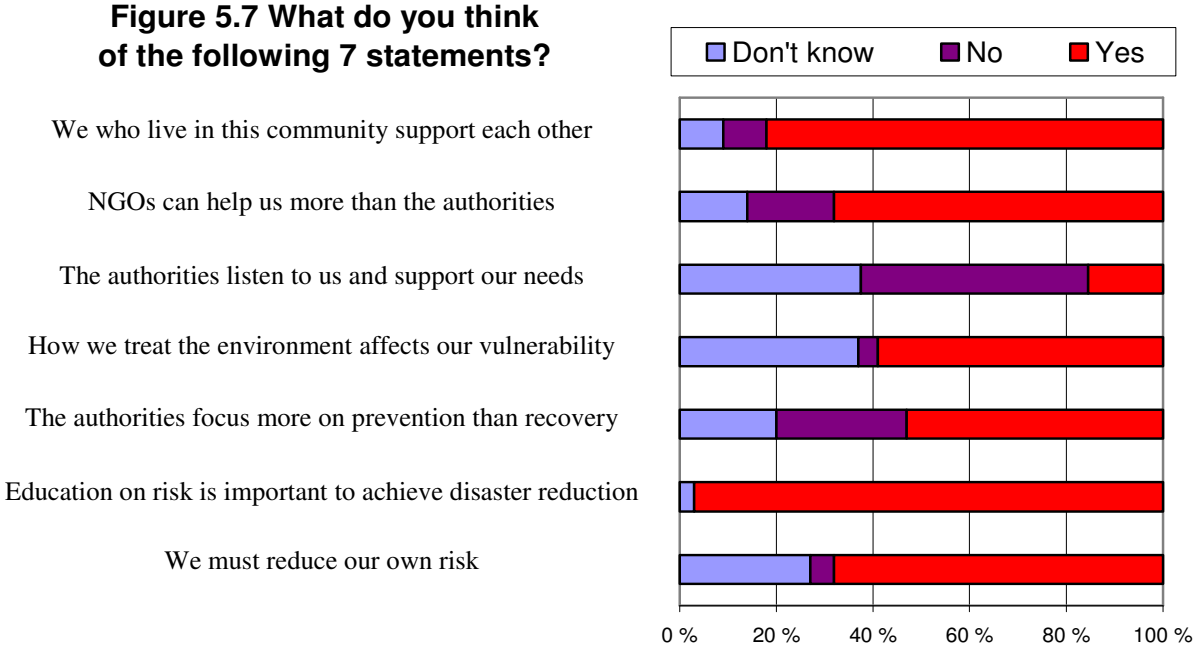
And I think that is a good point when discussing the possibility for a private organisation to support a local community in managing disasters; assess the community's vulnerabilities and capabilities, before projects are implemented. In addition successful participation by members of the local community is crucial, as the community must be a part of the process of creating a system that suites their threat and vulnerability situation. After all it is the community which is gone use the system. Participation in pre-disaster processes can strengthen community

relations as well as the community – organisation relationship, which again might improve the effectiveness of response operations and community coordination

Participation and local context, meaning local threat, vulnerability and capacity, are key words for organisations interested in working with local communities in an effort to reduce disaster affects. It is also said that at the local level there is an untapped potential in including women as important actors in the effort to building a culture of disaster prevention (UN/ISDR, 2007*c*). It was not a coincidence that I chose to include a women's group in my selection of subjects. And as I said the women were strong and empowered, and would be an obvious choice if an organisation was looking for a community actor to collaborate with in the effort to manage disasters.

After having studied disaster threatened communities it seems to me that such communities are open to collaborating with private organisations in a joint effort to reduce disaster affects. People acknowledge the risks natural hazards present and view preparing as important. In addition their positive attitudes reflected in the questionnaire (see **Figure 5.7**) towards NGOs and private organisations, as well as records of how private enterprises and foreign organisations have contributed more than national and local authorities, makes me believe that a local community – private organisation collaboration would be an efficient approach to DM.

Figure 5.7 What do you think of the following 7 statements?



Chapter 6 Concluding Remarks

6.1 Introduction

Does the world really need to experience a year with more disaster victims than in 2002, when close to 660,000,000 people were affected by natural disasters, before the right amount of attention is paid to disaster management? Didn't the 2004 tsunami carry a great enough *signal potential* (Alexander, 2006:16) to change the international community's approach to catastrophes?

The Norwegian government is a large provider of aid, but has so far not put aside funds specifically for disaster prevention in developing countries. The reason for this they say is that has not been an obvious need for such economic support related to disaster mitigation efforts (Bjergene and Bolle, 2009). According to the Norwegian Red Cross preventive disaster measures should be paid grater attention both economically and politically by donor states, as investing in the right prevention measures has the possibility to pay high dividends.

In 1994 the Yokohama Strategy (UNDP, 1994) stated that "awareness of the potential benefits of disaster reduction is still limited to specialized circles and has not yet been communicated to all sectors of society, in particular policy makers and the general public". 15 years later, equivalent to the MDG-period, I get the sense that this is still the case in DR. A specialized circle consisting of amongst others Defensa Civil (DC) and international institutions such as the UNDP, posses' knowledge and awareness of the importance of effective DM, and try to convey this to the public sector and decision makers, but these community actors still don't give disaster reduction big enough attention. The former leader of the Dominican civil defence explained that they tried to influence development plans and constructions, but were not listened to, and even accused of interfering with matters that were none of their business. Private developers with significant financial interests in the construction business actually openly shared their dissatisfaction with the advices and recommendations concerning constructions and hazards, which DC provided the regulatory government sectors with.

In the DR there is obviously a gap between those who are interested and depending on DM, and those who have the resources to invest in DM. This means that the support for those who need it and the resources for those who can utilize them in relations to DM, is not provided by those with decision-making power. The DR government does not pay needed significant attention to local disaster management; hence there are possibilities for organisations to get involved in issues related to DM, just as they are in involved in so many other societal issues important for sustainable development.

6.2 Main findings

If we are to experience increased resilience and sustained development for poor communities facing reoccurring natural disasters, the status of such communities most be heightened (McEntire, 2001). The social, political and economic status of poor individuals is obviously

undermined as their resources are inadequate when handling disasters and politicians more often than not, overlook or even hinder the chances of the most vulnerable to cope with the threats of disasters.

A central question which comes to the surface when working with disaster management issues is; can humans reduce disasters? Vulnerability is an important element of the effects and outcomes of disasters, and the most probable disaster "cause" humans can control. Therefore vulnerability should be a focal point when working with disaster management and disaster reduction in poor communities.

6.2.1 Increased disaster knowledge

Education regarding vulnerabilities should be a priority (McEntire, 2001). Education about triggering agents and the aspect of vulnerability should be a top priority; meaning teaching local poor communities and helping them understand and map their own vulnerabilities related to present triggering agents. I believe that would be a good effort in the work to help poor communities sustain development even though living with the threat of and experiencing disasters.

6.2.4 Disasters hinder development

There is a definite need to reduce the impacts of future disasters if we are to experience a development which responds to the aims of the MDGs. I don't believe the MDGs will be reached by 2015, nor do I believe international or local disaster management efforts and initiatives will be functioning in a manner that fully supports the thought of a sustainable development by that time. How ever the goals are needed and the efforts to strengthen local communities and disaster management capabilities must continue and be escalated so that the affects of natural disasters on development are reduced.

6.2.5 Supporting poor communities

Disasters are often characterized by generality rather than uniqueness (Alexander, 1997), but when it comes to finding ways of supporting communities in their effort to reduce the effects of disasters I believe my research shows that understanding the societal distinctiveness is important in order to sustain development while managing disasters. The three different communities that I studied are located near each other geographically, but still tell different stories and face different problems. This probably means that they will have different priorities as well as attitudes towards what kind of DM system to establish and how to establish it.

6.2.6 Findings related to international discourse

While the head of the WHO calls for the strengthening of national capabilities and improvements in international assistance (WHO, 2008), my research has focused on the possibilities for building local resilience and capabilities as means of reducing disaster impacts. The national level has in many ways proved unsatisfactory in this respect. Of course

national capabilities are important, especially relating to resources, but due to lack of trust and public support a local approach and self-help strategy seems sensible.

The IFRC (2005) suggest that instead of focusing on needs and vulnerabilities, one should focus on building capacity and resilience. I believe focusing on vulnerabilities and capabilities is related, as capabilities may nullify vulnerabilities. This of course depends on the type of vulnerability, as social vulnerabilities most often can not be overcome by economic capacity.

6.3 Prospects for further research

A longitudinal study or an action research approach regarding the actual implementation of e.g. an education program or community awareness raising campaign would be an interesting way to further research the possibilities for private initiatives to help poor communities in reducing the effects of future disasters.

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Appendices

Appendix 1: UN/ISDR: Terminology of disaster risk reduction

The ISDR Secretariat presents these basic definitions on disaster risk reduction in order to promote a common understanding on this subject, for use by the public, authorities and practitioners. The terms are based on a broad consideration of different international sources. This is a continuing effort to be reflected in future reviews, responding to a need expressed in several international venues, regional discussions and national commentary. Feedback from specialists and other practitioners to improve these definitions will be most welcome.

Capacity

A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster.
Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management. Capacity may also be described as capability.

Climate change

The climate of a place or region is changed if over an extended period (typically decades or longer) there is a statistically significant change in measurements of either the mean state or variability of the climate for that place or region.
Changes in climate may be due to natural processes or to persistent anthropogenic changes in atmosphere or in land use. Note that the definition of climate change used in the United Nations Framework Convention on Climate Change is more restricted, as it includes only those changes which are attributable directly or indirectly to human activity.

Coping capacity

The means by which people or organizations use available resources and abilities to face adverse consequences that could lead to a disaster.
In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards.

Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.
A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative

consequences of risk.

Disaster risk management

The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.

Disaster risk reduction (disaster reduction)

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.
The disaster risk reduction framework is composed of the following fields of action, as described in ISDR's publication 2002 "Living with Risk: a global review of disaster reduction initiatives", page 23:

- *Risk awareness and assessment including hazard analysis and vulnerability/capacity analysis;*
- *Knowledge development including education, training, research and information;*
- *Public commitment and institutional frameworks, including organisational, policy, legislation and community action;*
- *Application of measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;*
- *Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.*

Early warning

The provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response.
Early warning systems include a chain of concerns, namely: understanding and mapping the hazard; monitoring and forecasting impending events; processing and disseminating understandable warnings to political authorities and the population, and undertaking appropriate and timely actions in response to the warnings.

Emergency management

The organization and management of resources and responsibilities for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation.
Emergency management involves plans, structures and arrangements established to engage the normal endeavours of government, voluntary and private agencies in a comprehensive and coordinated way to respond to the whole spectrum of emergency needs. This is also known as disaster management.

Environmental degradation

The reduction of the capacity of the environment to meet social and ecological objectives, and needs.
Potential effects are varied and may contribute to an increase in vulnerability and the frequency and intensity of natural hazards. Some examples: land degradation, deforestation, desertification, wildland fires, loss of biodiversity, land, water and air pollution, climate change, sea level rise and ozone depletion.

Forecast

Definite statement or statistical estimate of the occurrence of a future event (UNESCO, WMO).
This term is used with different meanings in different disciplines.

Geological hazard

Natural earth processes or phenomena that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
Geological hazard includes internal earth processes or tectonic origin, such as earthquakes, geological fault activity, tsunamis, volcanic activity and emissions as well as external processes such as mass movements: landslides, rockslides, rock falls or avalanches, surfaces collapses, expansive soils and debris or mud flows.
Geological hazards can be single, sequential or combined in their origin and effects.

Hazard

A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity, frequency and probability.

Hazard analysis

Identification, studies and monitoring of any hazard to determine its potential, origin, characteristics and behaviour.

Hydrometeorological hazards

Natural processes or phenomena of atmospheric, hydrological or oceanographic nature, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
Hydrometeorological hazards include: floods, debris and mud floods; tropical cyclones, storm surges, thunder/hailstorms, rain and wind storms, blizzards and other severe storms; drought, desertification, wildland fires, temperature extremes, sand or dust storms; permafrost and snow or ice avalanches.
Hydrometeorological hazards can be single, sequential or combined in their origin and effects.

Land-use planning

Branch of physical and socio-economic planning that determines the means and assesses the values or limitations of various options in which land is to be utilized, with the corresponding effects on different segments of the population or interests of a community taken into account in resulting decisions.
Land-use planning involves studies and mapping, analysis of environmental and hazard data, formulation of alternative land-use decisions and design of a long-range plan for different geographical and administrative scales.
Land-use planning can help to mitigate disasters and reduce risks by discouraging high-density settlements and construction of key installations in hazard-prone areas, control of population density and expansion, and in the siting of service routes for transport, power, water, sewage and other critical facilities.

Mitigation

Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.

Natural hazards

Natural processes or phenomena occurring in the biosphere that may constitute a damaging event.
Natural hazards can be classified by origin namely: geological, hydrometeorological or biological. Hazardous events can vary in magnitude or intensity, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.

Preparedness

Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.

Prevention

Activities to provide outright avoidance of the adverse impact of hazards and means to minimize related environmental,

	technological and biological disasters. *Depending on social and technical feasibility and cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters. In the context of public awareness and education, related to disaster risk reduction changing attitudes and behaviour contribute to promoting a "culture of prevention".*
Public awareness	The processes of informing the general population, increasing levels of consciousness about risks and how people can act to reduce their exposure to hazards. This is particularly important for public officials in fulfilling their responsibilities to save lives and property in the event of a disaster. *Public awareness activities foster changes in behaviour leading towards a culture of risk reduction. This involves public information, dissemination, education, radio or television broadcasts, use of printed media, as well as, the establishment of information centres and networks and community and participation actions.*
Public information	Information, facts and knowledge provided or learned as a result of research or study, available to be disseminated to the public.
Recovery	Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk. *Recovery (rehabilitation and reconstruction) affords an opportunity to develop and apply disaster risk reduction measures.*
Relief / response	The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.
Resilience / resilient	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.
Risk	The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between

	natural or human-induced hazards and vulnerable conditions. *Conventionally risk is expressed by the notation Risk = Hazards x Vulnerability. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability. Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.*
Risk assessment/analysis	A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend. *The process of conducting a risk assessment is based on a review of both the technical features of hazards such as their location, intensity, frequency and probability; and also the analysis of the physical, social, economic and environmental dimensions of vulnerability and exposure, while taking particular account of the coping capabilities pertinent to the risk scenarios.*
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and the future needs. (Brundtland Commission, 1987). *Sustainable development is based on socio-cultural development, political stability and decorum, economic growth and ecosystem protection, which all relate to disaster risk reduction.*
Technological hazards	Danger originating from technological or industrial accidents, dangerous procedures, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. *Some examples: industrial pollution, nuclear activities and radioactivity, toxic wastes, dam failures; transport, industrial or technological accidents (explosions, fires, spills).*
Vulnerability	The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. *For positive factors, which increase the ability of people to cope*

with hazards, see definition of capacity.

Appendix 2: The Yokohama principles

1. Risk assessment is a required step for the adoption of adequate and successful disaster reduction policies and measures.

2. Disaster prevention and preparedness are of primary importance in reducing the need for disaster relief.

3. Disaster prevention and preparedness should be considered integral aspects of development policy and planning at national, regional, bilateral, multilateral and international levels.

4. The development and strengthening of capacities to prevent, reduce and mitigate disasters is a top priority area to be addressed so as to provide a strong basis for follow-up activities to IDNDR.

5. Early warnings of impending disasters and their effective dissemination are key factors to successful disaster prevention and preparedness.

6. Preventive measures are most effective when they involve participation at all levels from the local community through the national government to the regional and international level.

7. Vulnerability can be reduced by the application of proper design and patterns of development focused on target groups by appropriate education and training of the whole community.

8. The international community accepts the need to share the necessary technology to prevent, reduce and mitigate disaster.

9. Environmental protection as a component of sustainable development consistent with poverty alleviation is imperative in the prevention and mitigation of natural disasters.

10. Each country bears the primary responsibility for protecting its people, infrastructure, and other national assets from the impact of natural disasters. The international community should demonstrate strong political determination required to make efficient use of existing resources, including financial, scientific and technological means, in the field of natural disaster reduction, bearing in mind the needs of the developing countries, particularly the least developed countries.

Source: UNDP, 1994

Appendix 3: Interview Guide: Personal interview

Incident and effect

1. How has disasters affected you and your family? Loses?

2. What did you do when the flooding reached your community/house?

Pre-disaster

3. How do you prepare for disasters?

4. What about early warning systems?

5. What about community based disaster management systems?

6. Did any organizations/public institutions help identify and reduce risk/help you prepare for disaster?

Post-disaster

7. What happened to you and your family after the disaster was over?

8. How have you recovered/from whom have you received support?

    8.1. Which institutions/organisations have provided support for your community?

    8.2. Who has been the most important contributor or helped you most during these tough times?

    8.3. Can you mention any specific areas where help is most insufficient?

        8.3.1. Are there any institutions/organisations you think have done a poor job?

Risk and vulnerability

9. What does the concept of vulnerability mean to you?

10. What do you believe are the most important factors/means in order to reduce the affects of future disasters?

11. Do you believe people are aware of the risk that exists in the high-risk areas?

The future

12. What is the most important thing for you and your family now?

Appendix 4

Piedra Blanca, 23. feb. 2009 (marca con una X en el cuadro □ la/las respuesta(s) correcta(s))

1. ¿Que edad tiene usted? ..... años

2. ¿Cuantas personas viven en su hogar? .....adultos .....hijos

3. ¿Alguien en su hogar tienen trabajo permanente? □ Si □ No

4. ¿Cuantas tormentas ha experimentado? ..... (mas y menos)

5. ¿Como afecto la ultima tormenta a su comunidad? (puede elegir mas de una respuesta)

□ Mi casa fue destruida
□ Miembros de mi familia murieron
□ Las calles comunitarias fueron destruidas
□ Los puentes comunitarios fueron destruidos
□ Yo perdí mi fuente de ingresso
□ Mi vecinos murieron
□ La tienda/el colmado de la comunidad fue destruido

6. ¿Habían algunos proyectos de desarollo en su comunidad? □ Si □ No □ No sé

7. ¿Si la respuesta 6. es si; cual tipo de proyecto? (por favor escribe una respuesta corta)

.....

8. ¿Si la respuesta 6. es si; los proyectos de desarollo comó fueron afectados? (elige una sola respuesta)

□ No fueron afectado
□ Fueron afectados, pero todovía estan operando
□ Fueron destruido
□ Los proyectos se cayeron
□ No sé

9. ¿Usted estaba consiente de los riesgos de las tormentas para su comunidad?

□ Si, mas y menos
□ Si, claro!
□ No
□ No se

10. ¿Antes de Noel, la gente de su comunidad trato de reducir el riesgo y vulnerabilidad?

□ Si
□ Si, mas y menos
□ Si, claro! Siempre!
□ No
□ No sé

11. ¿Algunas organizaciones han ayudado con la identificación de los riesgos en su comunidad? □ Si □ No □ No sé

12. ¿Usted piensa que la preparación para tormentas futuras es importante?

□ Si □ No □ No sé

13. ¿Segun usted quien puede ayudar su comunidad a prepararse? (puede elegir mas de una respuesta)

□ Ayuntamiento □ Politicos
□ Organizaciones no-gubernamentales □ Organizaciónes extranjeras
□ Nadie, nosotros tenemos que prepararnos nosotros mismos

14. ¿Había un sistema de alarma temprana en su comunidad?
□ Si □ No □ No sé

15. ¿Segun usted cual es la mejor manera de prepararse para tormentas futuras?
(elige 1 o 2 de las respuestas siguientes)
□ Nosotros necesitamos educación sobre tormentas y prevención y preperación de tormentas
□ Nosotros necesitamos mejor información y mejor diálogo con las instituciones públicas
□ Nosotros necesitamos una infrastructura fortalecida
□ Nosotros necesitamos la creación de un sistema de alarma temprana/un mejor sistema
□ Nosotros necesitamos capacitación de los miembros de comunidad sobre la gestión de tormentas
□ Nosotros necesitamos que la conciencia sobre nuestra vulnerabilidad sea augmentada
□ Nosotros podemos reducir la vulnerabilidad nuestra mismos

16. ¿Había un sistema de gestion de emergencias en su comunidad?
□ Si □ No □ No sé

17. ¿Había un consejo responsable para la reducción de riesgo en su comunidad?
□ Si □ No □ No sé

18. ¿Segun usted cuando es mas importante que su comunidad recibe apoyo de afuera?
(puede elegir mas de una respuesta)
□ Antes que la tormenta ocurra □ Durante la tormenta
□ Después que la tormenta ha ocurido □ No sé

19. ¿Usted a participado en algunos talleres sobre como portarse durante una tormenta?
□ Si □ No
□ No sé □ No, pero he escuchado que esas actividades existen en otras comunidads

20. ¿Alguna organizaciónes/instituciónes han hecho una investigación sobre los efectos de la tormenta en la comunidad? □ Si □ No □ No sé

21. ¿Segun usted quien ha dado apoyo a ustedes despues que usted vive en esos albergues?
(puede elegir mas de una respuesta)
□ Ayuntamiento □ Políticos
□ El gobierno □ Organizaciones no gubernementales
□ Organizaciónes extranjeras □ Nadie

22. ¿Quien debe asumir la responsibilidad para cambiar la situacion de su vivienda?
(puede elegir mas de una respuesta)
□ Ayuntamiento □ Politicos
□ El gobierno □ Organizaciones non gubernementales
□ Organizaciónes extranjeras

23. ¿Usted tiene confianza en los políticos? □ Si □ Poco □ No □ No sé

24. ¿Que piensa usted de las frases siguientes?

• Yo pienso que la reducción de riesgo debe ser □ Si □ No □ No sé

• Yo pienso que educar a las personas sobre los riesgos de tormentas es una manera importante para reducir los efectos de tormentas □ Si □ No □ No sé

• Yo pienso que el gobierno esta mas enfocada en la prevención de desastres que recupera

□ Si □ No □ No sé

• Yo pienso que la manera de gestionar el medio ambiente puede reducir o aumentar la vulnerabilidad
□ Si □ No □ No sé

• Yo pienso que el gobierno nos escucha y nos ayuda con nuestras nesecidades
□ Si □ No □ No sé

• Yo creo que las organizaciones no gubernamentales pueden ayudarnos mas que el gobierno
□ Si □ No □ No sé

• Yo pienso que aqui la gente trata de ayudar al projimo □ Si □ No □ No sé

Appendix 5

Campo de Aviación, 25. feb. 2009 (marca con una X en el cuadro □ la/las respuesta(s) correcta(s))

1. ¿Que edad tiene usted? ..... años

2. ¿Cuantas personas viven en su hogar? .....adultos .....hijos

3. ¿Alguien en su hogar tiene trabajo permanente? □ Si □ No

4. ¿En cual comunidad estaba viviendo cuando ocurrió Noel ?
……..

5. ¿Cuantas tormentas ha experimentado? ..... (mas y menos)

6. ¿Como afecto la ultima tormenta a su comunidad? (puede elegir mas de una respuesta)

□ Mi casa fue destruida
□ Las calles comunitarias fueron destruidas
□ Yo perdí mi fuente de ingresso
□ La tienda/el colmado de la comunidad fue destruido
□ Miembros de mi familia murieron
□ Los puentes comunitarios fueron destruidos
□ Mi vecinos murieron

7. ¿Usted estaba consiente de los riesgos de las tormentas para su comunidad?

□ Si, mas y menos □ Si, claro!
□ No □ No se

8. ¿Antes de Noel, la gente de su comunidad trato de reducir el riesgo y vulnerabilidad?

□ Si □ Si, mas y menos □ Si, claro! Siempre!
□ No □ No sé

9. ¿Algunas organizaciones o instituciones públicas han ayudado con la identificación de los riesgos en su comunidad? □ Si □ No □ No sé

10. ¿Usted piensa que la preparación para tormentas futuras es importante?

□ Si □ No □ No sé

11. ¿Segun usted, quien puede ayudar su comunidad a prepararse?
(puede elegir mas de una respuesta)

□ Ayuntamiento
□ Politicos
□ Organizaciones no-gubernamentales
□ Organizaciónes extranjeras
□ Nadie, nosotros tenemos que prepararnos nosotros mismos

12. ¿Había un sistema de alarma temprana en su comunidad?

□ Si □ No □ No sé

13. ¿Segun usted cual es la mejor manera de prepararse para tormentas futuras?
(elige 1 o 2 de las respuestas siguientes)
□ Nosotros necesitamos educación sobre tormentas y prevención y preperación de tormentas

□ Nosotros necesitamos mejor información y mejor diálogo con las instituciones públicas
□ Nosotros necesitamos una infrastructura fortalecida
□ Nosotros necesitamos la creación de un sistema de alarma temprana/un mejor sistema
□ Nosotros necesitamos capacitación de los miembros de comunidad sobre la gestión de tormentas
□ Nosotros necesitamos que la conciencia sobre nuestra vulnerabilidad sea augmentada
□ Nosotros podemos reducir la vulnerabilidad nuestra mismos

14. ¿Había un sistema de gestion de emergencias en su comunidad?
□ Si □ No □ No sé

15. ¿Había un consejo responsable para la reducción de riesgo en su comunidad?
□ Si □ No □ No sé

16. ¿Segun usted cuando es mas importante que su comunidad recibe apoyo de afuera?
(puede elegir solo una respuesta)
□ Antes que la tormenta ocurra □ Durante la tormenta
□ Después que la tormenta ha ocurido □ No sé

17. ¿Usted a participado en algunos talleres sobre como portarse durante una tormenta?
□ Si □ No
□ No sé □ No, pero he escuchado que esas actividades existen en otras comunidads

18. ¿Alguna organizaciónes/instituciónes han hecho una investigación sobre los efectos de la tormenta en la comunidad? □ Si □ No □ No sé

19. ¿Por cuanto tiempo usted vivió en las albergues antes que llegue al Campo de Aviación?

…… meses

20. ¿Segun usted quien ha dado apoyo a ustedes despues Noel occure?
(puede elegir mas de una respuesta)
□ Ayuntamiento □ Políticos
□ El gobierno □ Organizaciones no-gubernementales
□ Organizaciónes extranjeras □ Empresas privadas
□ Nadie

21. ¿Usted tiene confianza en los políticos? □ Si □ Poco □ No □ No sé

22. ¿Que piensa usted de las frases siguientes?

1. Yo pienso que la reducción de riesgo debe ser □ Si □ No □ No sé

2. Yo pienso que educar a las personas sobre los riesgos de tormentas es una manera importante para reducir los efectos de tormentas □ Si □ No □ No sé

3. Yo pienso que el gobierno esta mas enfocada en la prevención de desastres que recuperación
□ Si □ No □ No sé

4. Yo pienso que la manera de gestionar el medio ambiente puede reducir o aumentar la vulnerabilidad
□ Si □ No □ No sé

5. Yo pienso que el gobierno nos escucha y nos ayuda con nuestras nesecidades
□ Si □ No □ No sé

6. Yo creo que las organizaciones no gubernamentales pueden ayudarnos mas que el gobierno
□ Si □ No □ No sé

7. Yo pienso que aqui la gente trata de ayudar al projimo □ Si □ No □ No sé

Appendix 6

Palmerito, 3. marzo 2009 (marca con una X en el cuadro □ la/las respuesta(s) correcta(s))

1. ¿Que edad tiene usted? ..... años

2. ¿Cuantas personas viven en su hogar? .....adultos .....niños

3. ¿Cuantas personas en su hogar tiene trabajo permanente? .....

4. ¿Desde cuando vive aqui en Palmerito? …… años

5. ¿Cuantas tormentas ha experimentado? ..... (mas y menos)

6. ¿Como afecto la ultima tormenta a su comunidad? (puede elegir mas de una respuesta)

□ Mi casa fue destruida
□ Las calles comunitarias fueron destruidas
□ Yo perdí mi fuente de ingresso
□ La tienda/el colmado de la comunidad fue destruido
□ Miembros de mi familia murieron
□ Los puentes comunitarios fueron destruidos
□ Mi vecinos murieron

6. ¿Habían algunos proyectos de desarollo en su comunidad ante Noel? □ Si □ No □ No sé

7. ¿Si la respuesta 6. es si; cual tipo de proyecto? (por favor escribe una respuesta corta)

.....

8. ¿Si la respuesta 6. es si; los proyectos de desarollo comó fueron afectados?

□ No fueron afectado
□ Fueron destruido
□ No sé
□ Fueron afectados, pero todovía estan operando
□ Los proyectos se cayeron

7. ¿Usted estaba consiente de los riesgos de las tormentas para su comunidad?

□ Si, mas y menos
□ No
□ Si, claro!
□ No se

8. ¿Antes de Noel, la gente de su comunidad trato de reducir el riesgo y vulnerabilidad?

□ Si
□ No
□ Si, mas y menos
□ No sé
□ Si, claro! Siempre!

9. ¿Algunas organizaciones o instituciones públicas han ayudado con la identificación de los riesgos en su comunidad? □ Si □ No □ No sé

10. ¿Usted piensa que la preparación para tormentas futuras es importante?

□ Si □ No □ No sé

11. ¿Segun usted, quien puede ayudar su comunidad a prepararse?
(puede elegir mas de una respuesta)

□ Ayuntamiento
□ Politicos

□ El gobierno □ Organizaciones no-gubernamentales

□ Empresas privadas □ Organizaciónes extranjeras
□ Nadie, nosotros tenemos que prepararnos nosotros mismos

12. ¿Hay un sistema de alarma temprana aqui en Palmerito?
□ Si □ No □ No sé

13. ¿Segun usted cual es la mejor manera de prepararse para tormentas futuras?
(elige 1 o 2 de las respuestas siguientes)
□ Nosotros necesitamos educación sobre tormentas y prevención y preperación de tormentas
□ Nosotros necesitamos mejor información y mejor diálogo con las instituciones públicas
□ Nosotros necesitamos una infrastructura fortalecida
□ Nosotros necesitamos la creación de un sistema de alarma temprana/un mejor sistema
□ Nosotros necesitamos capacitación de los miembros de comunidad sobre la gestión de tormentas
□ Nosotros necesitamos que la conciencia sobre nuestra vulnerabilidad sea augmentada
□ Nosotros podemos reducir la vulnerabilidad nuestra mismos

14. ¿Hay un sistema de gestion de emergencias aqui en Palmerito?
□ Si □ No □ No sé

15. ¿Hay un consejo responsable para la reducción de riesgo en Palmerito?
□ Si □ No □ No sé

16. ¿Segun usted cuando es mas importante que su comunidad recibe apoyo de afuera?
(puede elegir solo una respuesta)
□ Antes que la tormenta ocurra □ Durante la tormenta
□ Después que la tormenta ha ocurido □ No sé

17. ¿Usted a participado en algunos talleres sobre como portarse durante una tormenta?
□ Si □ No
□ No sé □ No, pero he escuchado que esas actividades existen en otras comunidads

18. ¿Alguna organizaciónes/instituciónes han hecho una investigación sobre los efectos de la tormenta en Palmerito? □ Si □ No □ No sé

20. ¿Segun usted quien ha dado apoyo a ustedes despues Noel occure?
(puede elegir mas de una respuesta)
□ Ayuntamiento □ Políticos
□ El gobierno □ Organizaciones no-gubernementales
□ Organizaciónes extranjeras □ Empresas privadas
□ Nadie

21. ¿Usted tiene confianza en los políticos? □ Si □ Poco □ No □ No sé

22. ¿Que piensa usted de las 7 frases siguientes?

1. Yo pienso que la reducción de riesgo debe ser □ Si □ No □ No sé
2. Yo pienso que educar a las personas sobre los riesgos de tormentas es una manera importante para reducir los efectos de tormentas □ Si □ No □ No sé
3. Yo pienso que el gobierno esta mas enfocada en la prevención de desastres que recuperación
□ Si □ No □ No sé
4. Yo pienso que la manera de gestionar el medio ambiente puede reducir o aumentar la vulnerabilidad
□ Si □ No □ No sé
5. Yo pienso que el gobierno nos escucha y nos ayuda con nuestras nesecidades
□ Si □ No □ No sé
6. Yo creo que las organizaciones no gubernamentales pueden ayudarnos mas que el gobierno
□ Si □ No □ No sé
7. Yo pienso que aqui la gente trata de ayudar al projimo □ Si □ No □ No sé