

## Disasters put development at risk

A 2004 United Nations Development Program (UNDP) Report titled "Reducing Disaster Risk-A Challenge for Development" acknowledged that disasters that result from natural hazards exact a tremendous cost on development.<sup>8</sup> The Report estimated that 85% of the world's population exposed to disasters triggered by one or more natural hazard, such as, floods, earthquakes and droughts live in countries categorized in the low to medium human development ranking. The associated annual economic losses from disasters averaged US\$ 75.5 billion in the 1960s, US\$ 138.4 billion in the 1970s, US\$ 213.9 billion in the 1980s and US\$ 659.9 billion in the 1990s. The Report admitted, that 'the consequences of such widespread exposure to natural hazard for human development are only now beginning to be identified'.

## Development can increase the risk of disaster

Linkages between development and disaster risk are not difficult to visualize (UNDP). Any development activity has the potential to either increase or reduce disaster risk. Rapid urbanisation, for example, can generate new disaster risks. Concentration of populations on flat coastal areas may worsen the effects of flooding and sea surges; extensive settlements in hazard-prone zones and/or poor building codes and construction may place a significant number of the population in harm's way.

The growth of informal settlements and inner city slums, whether fuelled by international migration or internal migration from smaller urban settlements or the countryside, has led to the growth of unstable living environments. These settlements are often located in ravines, on steep slopes, along flood plains or adjacent to noxious or dangerous industrial or transport facilities. Rural livelihoods are put at risk by the local impacts of global climate change or environmental degradation. Coping capacity for some people has been undermined by the need to compete in a globalising economy, which at present rewards productive specialisation and intensification over diversity and sustainability.

## The bottom line!

- The Caribbean is vulnerable to natural hazards. In the last two decades, there has been a marked increase in the region's exposure to a range of natural hazards.
- The region's land, water and forests resources and their dependent sectors of agriculture, forestry and fisheries are highly exposed and vulnerable to extreme events caused by natural hazard.
- Climate change impacts are projected to increase the frequency and severity of weather-related events.
- Caribbean leaders must recognise inescapable link between management of natural hazards and their countries' development prospects and systematically incorporate hazard management into development planning.

<sup>8</sup> 'A Global Report – Reducing Disaster Risk-A Challenge for Development', United Nations Development Programme, Bureau for Crisis Prevention and Recovery, ISBN 92-1-126160-0, 2004.



## 1. Natural Hazards, Disasters and Agricultural Impacts

*Natural hazards are "naturally occurring physical phenomena" or risk elements inherent in the natural environment; an inevitable part of life on earth.<sup>1</sup>*

### Key Messages:

- Natural hazards are a natural part of life on earth!
- Most natural hazards are known and some even give advance warning!
- Living and/or working in hazard-prone areas increases the risk of disastrous impacts!
- Changing climate increases the frequency and severity of natural hazards and their impacts!
- Agricultural activity is vulnerable to natural hazards which often lead to disastrous impacts!
- Disasters are costly and put development at risk!
- The Caribbean needs to take more seriously the issue of hazard and risk management!
- Disastrous impacts can be reduced through better understanding of natural hazards, their different triggers and vulnerability factors.

### Natural hazards

***In many situations, the probability of one or more natural hazards can be predicted, with different advance warning depending on the type of hazard.***

Natural hazards may be of either: (a) atmospheric or 'weather-related' (hydro-meteorological) origin, such as, hurricanes, floods, droughts; (b) geological origin, such as, earthquake, volcanic eruption, landslides, tsunamis; or (c) environmental origin, such as, wild (forest) fires and invasive species.

### Disasters

***Disaster as a concept is considered difficult to define in its entirety.***

Disaster is a catastrophe, mishap, calamity or grave occurrence affecting an area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as beyond the coping capacity of the community of the affected area<sup>2</sup>. In contemporary academia, disasters are seen as the consequence of inappropriately managed risk. These risks are the product of hazards and vulnerability. Hazards that strike in areas with low vulnerability are not considered a disaster, as is the case in uninhabited regions.<sup>3</sup>

### Natural hazards must not automatically cause disaster!

***Disasters are 'the consequences or effects of natural hazards....' '.... a serious breakdown in sustainability and disruption of economic and social progress'.***

Natural hazards 'must not automatically cause disaster', observing that they may not be 'entirely 'natural', for people are agents of disaster" since some human practices and activities (e.g., deforestation, unregulated hillside construction) may increase the level of exposure to risks and/or may trigger disasters (UNESCO).

<sup>1</sup> The United Nations Environmental Social and Cultural Organisation (UNESCO) defined

<sup>2</sup> Disaster Preparedness in Agriculture in India by Dr. Ashok Kumar

<sup>3</sup> Disaster Information from befall.org 'your complete disaster resource'

## **Agriculture is highly vulnerable to natural hazards**

**Agriculture – land, crops, livestock, marine fisheries and farm/factory infrastructure - is highly vulnerable to natural hazards, especially those related to extreme weather events.** Those that have wreaked havoc on an annual basis include:

- Tropical depressions, storms or hurricanes. These are large-scale weather systems developing over tropical or sub-tropical waters are a constant threat and cause a severe disruption in economic activity and cause severe destruction of physical infrastructure. The cost of hurricane-induced disaster, measured in percentage of gross domestic product (GDP), ranged from a low of 2.39% of GDP from Tropical Storm Allen in Jamaica in 1980, to 96.8% of GDP from Hurricane Ivan in Grenada in 2004. Some crops, such as bananas, are vulnerable to strong winds experienced during tropical depressions.
- Drought, the insufficiency of rain for an extended period that causes water shortages, stream-flow reduction and depletion of groundwater and soil moisture, have severe impacts on primary agriculture activities. Agriculture in the Caribbean is still largely rain-fed, rendering it highly vulnerable to prolonged drought conditions, as occurred in the Caribbean in the late 2009 to early 2010 period.
- Floods, whether flash, minor or major flooding are becoming more prevalent and harmful over time and are listed as among the world's most frequent and damaging forms of disaster. Flood hazards may be difficult to minimize in the absence of enforced policies and laws that deal with zoned land use, denudation of hillsides and the de-silting of watercourses.
- Landslides, downslope movements of soil, rock or mud, triggered by prolonged or heavy rainfall and earthquakes, among others, displace agricultural lands and destroy crops. Losses in the form of buried cropland and delays that span months to a few years before replanted crops are harvestable lead to substantial loss of livelihoods for many small farmers.
- Invasive species are non-indigenous species that 'arrive, survive and thrive' successfully out-competing native organisms for food and habitat. The Caribbean, one of the World's biodiversity hotspots, has an exceptionally high level of species endemism which is fragile and particularly vulnerable to invasive species.

It is usually the small and poor farmers who settle and farm in hazard-prone areas most vulnerable to natural hazards. They are also the ones with limited coping mechanisms. When their livelihoods are damaged, the socioeconomic, environmental and cultural elements of farming systems, and fabric of rural communities, are compromised.

<sup>4</sup> Longley and Richards 1998; FAO 1998, cited in Questioning Seeds and Tools: Emerging Strategies in Post-Disaster Seed Relief and Rehabilitation by Caroline Eberdt

## **Climate change has increased vulnerability**

### **Changing climate increases the frequency and severity of natural hazards and their impacts!**

Climate change is an evolving phenomenon which is exacerbating the frequency and severity of natural hazards and consequently, the vulnerability of Caribbean countries to their potentially devastating impacts. Climate Change usually refers to changes in modern climate. It may be qualified as anthropogenic Climate Change, which is an admission that the changes are caused by man's activities, or more generally referred to as "global warming". Agriculture has been shown to produce significant effects on climate change, primarily through the production and release of greenhouse gases such as carbon dioxide, methane, and nitrous oxide, but also by altering the Earth's land cover, which can change its ability to absorb or reflect heat and light. The Carbon cycle is a means of looking at the movement of carbon and carbon dioxide throughout the planet. Climate change is projected to have significant impacts on conditions affecting agriculture, including temperature, carbon dioxide, glacial run-off, precipitation and the interaction of these elements. These conditions determine the carrying capacity of the biosphere to produce enough food for the human population and domesticated animals.

### **Disasters are Costly!**

#### **Global damages caused by disasters totaled US\$ 1.8 billion in 2008 alone.<sup>6</sup>**

For Caribbean countries, the social, financial and economic costs of disasters are unavoidable and high.

Some impacts of tropical storms and hurricanes were:<sup>5</sup>

- Hurricane Georges (1998), incurred damaged estimated at over US\$900M in Antigua and Barbuda, Dominica Saint Kitts & Nevis combined;
- Hurricane Lenny (1999) incurred damage totalling over US\$250 million in Anguilla, Dominica, Saint Kitts & Nevis;
- Tropical Storm Lily (2002) left behind US\$7.5M in losses;
- Hurricane Ivan (2004) incurred damage estimated at US\$595M in Jamaica and US\$889M in Grenada.

Some impacts of the 2009 to 2010 drought were:<sup>7</sup>

- 25 % loss in onion crop, 30 % loss in tomato with consequent price hike in Antigua;
- drop in the contribution of hydro power from 28.69% in Feb 2009 to 12.01% in Feb 2010 in St. Vincent;
- substantial reduced flow at Mirabeau, 60 % below average, in Grenada;
- Caroni Arena lake was 29.46 % of capacity in Trinidad;
- drop in the Mona Reservoir to 40% of capacity and Hermitage Dam to 34% of capacity, in Jamaica;
- record bush fires all across the Caribbean

**Given the small size of Caribbean states, such losses from disasters demonstrate the economic importance of managing risk as a major plank in the development agenda.**

<sup>5</sup> Information reported by the Caribbean Institute for Meteorology and Hydrology (CIMH)

<sup>6</sup> International Federation of Red Cross and Red Crescent Societies. 2009. World Disasters Report: Focus on Early Warning, Early Action. IFRC. Switzerland.

<sup>7</sup> Ibid CIMH