

The Series: Looking at countries in the context of natural catastrophes positions World Vision to better predict, prevent or prepare for the onslaught of disasters. The rationale is simple: disasters can wipe out years of development in mere minutes. Reducing disaster risks is not an optional extra – but an extra obligation. It is at the heart of sustainable development.





I. The Facts

Bangladesh is among the poorest and most densely populated countries in the world. Almost half of the population fight daily for survival, on less than one dollar per day. However, Bangladesh is working hard to reduce population growth and improve health and education. About one third of this extremely poor country floods annually during the monsoon rainy season, hampering economic development. The fast facts follow:

| People's Republic of Bangladesh | Population: 153.3 million (1) |
|---|--|
| Extreme Poverty – Population living below \$1 a day in percent [real figures] | 41.3% [63.3 million] (2) |
| Poverty – Population living below \$2 a day in percent [real figures] | 84% [128.8 million] ⁽²⁾ |
| Life expectancy at birth, annual estimates (2005) | 63.1 years (1) |
| Adult illiteracy rate (15 and older, 1995-2005) | 52.5% ⁽³⁾ |
| Children underweight for age (under age 5, 1996-2005) | 48% (4) |
| Population undernourished in percent [real figures] | 30% [45.99 million] ⁽⁵⁾ |
| Physicians (per 100,000 people, 2000-04) | 26 [equals one doctor per 3846 people] (6) |
| Human Development Index (HDI) value [rank] | 0.547 [rank: 140 of 177] (7,8) |
| Natural Disaster Index (NDI) value [risk; rank] | 0.94 [risk: "extreme"; rank: 5 of 204] (9,10,12) |

2. The Forces

"Ten percent of people worldwide live less than ten metres above sea level and near the coast, a high-risk zone for floods and storms – about 75 percent of them live in Asia. (13) Climate change and rising sea levels exacerbate the high risk. Millions more will be vulnerable unless the world invests in mitigation efforts to prepare for a worsening disaster environment." (Laurence Gray, Regional World Vision Advocacy Director)

Disaster Environment: The severity of any disaster depends on two factors: the country context within which the disaster occurs, and the nature and force of the onslaught itself. Given a country context like that of Bangladesh with 130 million people (84% of the population) fighting for survival on less than two dollars a day, and with only one doctor for every 3,800 people, the impact of a catastrophe can be cataclysmic.

Bangladesh's disaster environment is defined in large by disastrous surges along the complex coastline of the Bay of Bengal, including one of the world's largest river systems – the Ganges-Meghna-Brahmaputra. Contributing factors are manifold: shallow coastal waters, high tides, favourable cyclonic track, and densely populated low-lying land: 70 million people live in areas below 10 metres above sea level (13) and 50 million below five metres.

Disaster Definition: The Center for Research on the Epidemiology of Disasters (CRED) defines a disaster as a "situation or event, which overwhelms local capacity, necessitating a request to national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering." For a disaster to be entered into the EM-DAT⁽¹²⁾ database, at least one of the following criteria must be fulfilled:

- 10 or more people reported killed
- 100 people reported affected
- Declaration of a state of emergency
- Call for international assistance

Past Years: Using this definition, the years 1990-2007 have seen Bangladesh impacted by 164 natural disasters. The vast majority of Bangladesh's disasters feature little in international news but amount to great destruction when added together (figure 1). The pie charts show the prevalence of natural catastrophes by disaster types (figure 2) and the number of people affected by them (figure 3).

Wind storms are both the most *prevalent* (50%) and most *deadly* natural disasters (more than 147,000 people killed). Floods (27%) cause the most *far-reaching damage and suf-fering* (more than 115 million people affected).

Past Century: Mega-disasters – sometimes called "disasters of the century" – occur less frequently, but their destructive force can overpower a vulnerable nation. Figures 4 and 5 show two perspectives of the top three natural disasters in Bangladesh since record-keeping began in 1904. [Data based on (12).]

Figure 1: Impact from 164 natural disasters (summary for 1990-2007)

Human Impact Cumulative Total Annual Average

1. People killed 159,133 8,841

2. People affected 151.1 million 8.4 million

3. Damage caused US\$ 13.7 billion US\$ 761 million

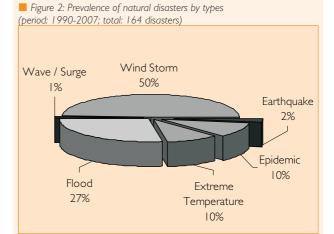


Figure 3: Number of people affected by natural disaster types (period: 1990-2007; total: 151.1 million people affected)

Earthquake
18,925

Wave / Surge Wind Storm
12,010 32,990,355

Extreme
Temperature
187,200

Figure 4: Worst disasters (by people killed; period: 1904-2007)

| Top Three Disasters (Date) | People killed |
|-------------------------------|---------------|
| I. Drought (1943) | 1,900,000 |
| 2. Epidemic (1918) | 393,000 |
| 3. Wind Storm (12. Nov. 1970) | 300,000 |

Figure 5: Worst disasters (by people affected; period: 1904-2007)

| Top Three Disasters (Date) | People affected |
|----------------------------|-----------------|
| I. Flood (June 1988) | 45 million |
| 2. Flood (July 1974) | 38 million |
| 3. Flood (20 June 2004) | 36 million |



3. The Faces

Wind storms kill the most people in Bangladesh. Figures from the EM-DAT database show that between 1990 and 2007 wind storms killed 147,977 people. (12) Tropical Cyclone Sidr (15-19 Nov. 2007) was among the most deadly. It killed 4,234 people, injured 55,282 and affected 8,923,259 (causing US\$ 2.3 billion in damages). (12) According to the Bangladesh Disaster Management Information Center, it destroyed 563,877 households. (15)

Instead of asking for breakfast, seven-year-old Supria anxiously asked, "Where will we stay the night? Our house is broken!" Supria Mondol is a World Vision sponsored child, the youngest among six sisters. The night of the disaster her mother Radha was desperate. "I didn't know what to do... how I should try to save my daughters and household things. The winds were so strong. Finally I took my daughters to a neighbour's house, which was stronger than ours. I embraced Supria and held her tight so that she would not be swept away by the strong winds," Radha said.

"We heard World Vision volunteers giving warning messages with loudspeakers to protect our lives. But we never imagined that the winds would come so quickly and become so strong," Radha said. "When I saw how much our house was shaking, I told Anita to run to my nephew's house. Within moments, our house tilted diagonally, from one end to the other. We took shelter on the veranda but quickly realised it was not safe there. That was when I picked up Supria and ran as fast as I could to my nephew's house. The next morning we could not believe what had happened to our home. Both living and cooking houses were destroyed. Our coconut-leaf walls had fallen on one side and the rice-straw roof on the other. Leaves from nearby banana trees and our belongings were scattered everywhere." Supria liked to play with marbles, and had a small collection. But her treasured toys were lost. Even her toothbrush disappeared.

World Vision Bangladesh provided a seven-day relief package containing food, clothing and other basic items, including two bundles of corrugated iron sheet to help set

up emergency shelter. A US\$15 million aid initiative was also launched with the aim of sheltering more than 50,000 people whose homes were torn to shreds by Cyclone Sidr and assisting 12,925 families by providing tin sheeting. A total of 125 staff and 700 volunteers were involved in the response. Vince Edwards, World Vision Bangladesh National Director, said: "Our teams on the ground found that most poor families who lost their homes were living out in the open. We focused our efforts on the worst affected — those who completely lost their homes, women-headed households, the poor and those families who had children with disabilities."



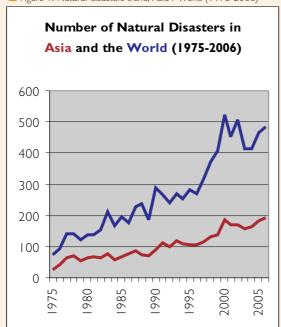
One of the few things Supria was able to salvage from the ruined remains of her bamboo home was her tiny wooden mirror. But she searched in vain for the only family photo, blown away by the storm.

4. The Forecasts

"The countries most vulnerable are least able to protect themselves." (Kofi Annan) ($^{(16)}$ "Soon will come a day when climate change escapes all control. We are on the verge of the irreversible. Faced with this emergency, the time is not for half-measures. The time is for a revolution: a revolution of our awareness, a revolution of the economy, a revolution of political action." (Jacques Chirac) ($^{(17)}$)

The Trends: Over recent decades, the number of natural disasters has steadily risen, both globally, regionally (figure I) and nationally (figure 2). Past progressions (below) and future forecasts (right) speak the same language.

Figure 1: Natural disasters trend, Asia / World (1975-2006) (12)



Number of Natural Disasters in Bangladesh (1975-2006)

Figure 2: Natural disasters trend, Bangladesh (1975-2006) (12)

Global Forecasts: Recent assessment reports by the UN Intergovernmental Panel on Climate Change (IPCC), the recognised global authority on climate change honoured with the Nobel Peace Prize 2007, have released substantive scientific forecasts about global climate change: (18)

- Probable temperature rise by 2100: 1.8-4.0° C
- Possible temperature rise by 2100: 1.1-6.4° C
- Probable sea level rise: 18-59 cm
- Increase in droughts, tropical cyclones and extreme high tides: "likely" (>66%)
- More frequent warm spells, heat waves and heavy rainfall: "very likely" (>90%)

Rising sea levels mean more and more severe floods. The trend is not only expected to continue but to accelerate. During the last century, global sea levels rose 10-25 cm which – given the predictions – amounts to a two- to five-fold acceleration. (14) The effects are undeniable. In 2006 the world was impacted by a record 226 floods (up from an average 162 in previous years). (19) Pacific islands and low-lying countries are particularly vulnerable, and the world's *first evacuation* of low-lying islands due to climate change is now underway in Papua New Guinea's Carteret Islands. More such evacuations are expected as storms, surges and floods continue to inundate low-lying land. (20) About 1.5 billion people were affected by floods in the last decade of the 20th century. (21)

National Forecasts: Up to one third of low-lying Bangladesh floods annually during the monsoon season – under the best of circumstances. (Extreme floods can cover up to two thirds of the country.) However, if Bangladesh's susceptibility to inundation is compounded by more intense tropical storms, more frequent floods and rising sea levels, the outlook will be catastrophic. A rise in sea level of only one metre would inundate 18 percent of land and directly threaten II percent of the population. Coupled together with overflowing river levels, over 70 million people could be affected. (22) Climate scenario exercises for Bangladesh also suggest that a 4°C temperature increase could reduce rice production by 30 percent and wheat production by 50 percent. (31) Add to all that the steady erosion of the Sundabarns area – the world's largest mangrove forest – "instrumental in saving thousands from certain death when Cyclone Sidr struck in 2007" (24) – and the pressure cooker for disasters is building.

Climate change has the potential to undo the last 50 years of development work. The poorest will be hit first and worst. Policy makers and NGOs must help Bangladesh prepare itself. ■



5. The Focus

"Recent years have seen a dramatic rise in the frequency and severity of catastrophes and the trend is towards greater vulnerability and larger losses." (OECD Secretary-General Angel Gurría) (25) "Global temperature increases of 3 to 4°C could result in 330 million people being displaced through flooding. Over 70 million people in Bangladesh could be affected." (UNDP) (7)

The Floods: Bangladesh is prone to flooding and incurs multiple types – monsoon river floods, flash floods, local rainfall floods and storm surge floods. With 46 percent of the population living within 10 metres of sea level, millions in Bangladesh are vulnerable to floods. (13) The satellite image shows the August 2007 flood (inundated land shown in blue). The flood covered 42.21 percent of Bangladesh. (26) The fallout: one flood, two weeks, 848 dead, 11.4 million affected, US\$100 million damage. (12)

Source: Bangladesh Space Research and Remote Sensing Organization (SPARRSO). Satellite image: Bangladesh, August 2,3,4,5,7 & 8, 2007

The Homeless: The net effect of Bangladesh's floods is disaster homelessness. It constitutes a major challenge for much of the developing world. A recent World Bank study found that 97.7% of people made homeless worldwide by natural disasters live in developing countries. The study also found that Bangladesh has the world's *highest* prevalence of disaster homelessness. Between 1980 and 2000 more than 37 million people in Bangladesh – 30% of the population – were made homeless by disasters. (27) Over 13 million of them were children. With average ground levels in coastal areas as low-lying as 1.5 to 2 metres above sea level and tidal surges reaching up to 6 metres, (28) the consequences of cyclonic surges can be deadly.



A third of Bangladesh annually experiences inundation during the monsoon season. Extreme floods can cover up to two thirds of the country and make millions of people homeless.



6. The Future

"The lesson ... is encapsulated in the theme of this year's International Day for Disaster Reduction: 'Invest to prevent disaster.' We cannot stop natural calamities, but we can and must better equip individuals and communities to withstand them. Those most vulnerable to nature's wrath are usually the poorest, which means that when we reduce poverty, we also reduce vulnerability." (Kofi Annan, 2005) (29)

The Investment: Recent years have seen a shift from disaster response to disaster readiness and mitigation. Increasing resilience means promoting *preparedness*. This is one of the most critical challenges facing policy makers and NGOs in the new millennium. By positioning to reduce the impact of disasters *before* they occur, unnecessary harm can be averted and decades of developmental achievements protected. Reducing risks is at the heart of sustainable human development – predict, prevent, prepare, protect.

Reaping the benefits of disaster preparedness requires investment. One study found that for every dollar invested in pre-disaster risk reduction activities in developing countries seven dollars in losses can be prevented. (30) However, most donor funding comes in response to appeals *after* major disasters. Making the shift from post-disaster recovery to pre-disaster preparedness is the most critical success factor facing governments and aid agencies today.

Preparedness: Reducing risk and raising resilience is a multi-tiered approach. It involves fine-tuning early warning mechanisms, improving emergency response capabilities, monitoring weather patterns, advocating for public protection policies and cultivating a culture of disaster readiness at both grassroots local community and national policy making levels. It also entails training primary health care staff to manage and care for evacuees, identifying strategies

to deal with mass casualties and large-scale disaster homelessness, coordinating regular preparedness drills with the government and local organisations, and identifying the best routes for transporting the injured, food and first aid supplies. At the policy making level it requires a commitment to things like mangrove protection and reforestation. The Sundarbans – the world's largest mangrove forest – is instrumental in protecting thousands from death when cyclonic surges strike. About 40 percent of this UNESCO world heritage site is now destroyed. The Chief Conservator of Forests A. Shamsuddin described the Sundarbarns as "Bangladesh's guardian angel" in protecting people from storms and tidal waves. (24)

Teaching Children: The fact that 98 percent of people affected by climate disasters live in developing countries highlights the link between *levels of development and natural disaster risk.* (23) Educating children about natural disasters, evacuation strategies, the mechanics of earthquakes, wind storms, floods, etc., and how to prepare for and survive them is already part of preparedness drives in some Southeast Asian countries. (32) Such initiatives (incl. simulations, competitions, skits, story-telling, and mock disaster drills) promote a culture of disaster readiness in children and help raise up a new generation of resilient people who are ready, responsible and response-able. ■



World Vision Capacity

- 320 National Rapid Response Team relief specialists are on stand-by for rapid deployment in country-wide emergency situations
- Support for children in the form of Child Friendly Spaces programmes (shelter, systems and psycho-social help) is rapidly deployed following a disaster. Toys and protection provide safety and rehabilitation to disaster-traumatised children
- 18 World Vision cyclone shelters and 340 dual-purpose disaster shelters at schools offer protection to 100,000 people (and a limited number of livestock) for periods of up to several days or weeks during rapid onset disasters
- 53 World Vision programme areas integrate integrate disaster risk reduction measures into community development programming and design
- **53 Disaster Response Teams** based at World Vision programme level (comprising 6 members each) mobilise disaster management facilitators and community volunteers for rapid early warning preparedness, and conduct surveys and assessments prior to relief operations
- 147 Disaster management facilitators gather and disseminate information at the grassroots level and assist in carrying out survey and relief operations
- 5,000 active community volunteers are on stand-by to liaise with government and non-government organisations and are available to provide assistance in the dissemination of disaster-related information
- 137,143 World Vision sponsored children are steeled for natural disasters through education and health care, bolstering overall community resilience (a growing number of sponsored children are undergoing school-based training in disaster risk reduction)

7. The Footnotes

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- 2 UNDP. Human Development Report 2007/2008. Bangladesh. {Source: World Bank. 2007b. World Development Indicators 2007. CD-ROM. Washington, D.C. (Data refers to most recent year available during the period specified, 1990-2005.)}
- 3 UNDP. Human Development Report 2007/2008. Bangladesh. (Source: adult literacy rates from UNESCO (United Nations Educational, Scientific and Cultural Organization) Institute for Statistics. 2007a. Adult and youth literacy rates. May. Montreal.)
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- 6 UNDP. Human Development Report 2007/2008. Bangladesh. {Source: WHO (World Health Organization). 2007a. Core Health Indicators 2007 Database. Geneva. [http://www.who.int/whosis/database/]. Accessed July 2007. Data refers to the most recent year available.}
- 7 UNDP. Human Development Report 2007/2008. Fighting climate change: Human solidarity in a divided world. Published 2007. New York. USA
- The Human Development Index (HDI) is a composite index that measures the average achievements in a country in three basic dimensions of human development: a long and healthy life (measured by life expectancy at birth); knowledge (measured by adult literacy rate and enrollment ratio for primary, secondary and tertiary schools); and a decent standard of living (measured by GDP per capita in purchasing power parity (PPP) US dollars). While the concept of human development is much broader than any single composite index can measure, the HDI offers a powerful alternative to income as a summary calculation measure of human well-being and development. It is used to distinguish whether a country is a developed, developing, or under-developed country. The index was developed in 1990 by Pakistani economist Mahbub ul Haq and has been used since 1993 by the United Nations Development Programme in its annual Human Development Report.
- The Natural Disaster Index (NDI) is a composite index developed by Maplecroft. The NDI measures the relative risk to human health from natural disasters. The NDI incorporates the following types of natural disasters: hydro-meteorological disasters (droughts, extreme temperatures, floods, slides, wildfires, and wind storms); geological disasters (earthquakes, tsunamis, and volcano eruptions); biological disasters (epidemics and insect infestations). To calculate the risk to human health from natural disasters, the NDI analyses the following indicators: number of deaths; number of people injured; number of people made homeless; number of people otherwise affected. By using the indicators above, rather than the number of deaths alone, the NDI renders a holistic perspective of the risks posed by natural disasters.
- 10 Data for the NDI has been obtained from two sources. First, natural disaster data has been obtained from the EM-DAT Database (2005). Second, population and economic data comes from the World Development Indicators (2005), compiled by the World Bank Group. A disaster must fulfill at least one of the following criteria: 10 or more people reported killed (incl. 'persons confirmed as dead' or 'presumed dead'); 100 people reported affected (covering those 'requiring immediate assistance'); declaration of a state of emergency; call for international assistance.
- Laurence Gray. World Vision Regional Advocacy Director for the Asia-Pacific region. Laurence_Gray@wvi.org
- 12 The EM-DAT International Disaster Database, Université Catholique de Louvain, Brussels, Belgium [www.em-dat.net] is a joint project of the Centre for Research on the Epidemiology of Disasters (CRED) and USAID's Office of Foreign Disaster Assistance (OFDA). According to EM-DAT classification, natural disasters comprise droughts, earthquakes, epidemics, extreme temperatures, floods, insect infestations, slides, volcanos, waves / surges, wild fires, and wind storms.

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- **3** Government of the People's Rep. of Bangladesh. 2005b. Page 94 in (/)
- 32 IRIN. Indonesia: Disaster-preparedness drive in West Sumatra. 31 Dec. 2007. http://www.irinnews.org/Report.aspx?ReportId=76049
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exploring new horizons:

highlighting
vulnerabilities, risks and
opportunities for improved
pre-disaster preparedness!

Issues highlighted in this fact sheet are discussed in more depth in the World Vision annual disaster reports.

"Prevention is not only more humane than cure; it is also much cheaper. Above all let us not forget that disaster prevention is a moral imperative..."

—Kofi Annan

Photo: J. Fromer

World Vision is a Christian humanitarian organisation dedicated to working with children, families and communities to overcome poverty and injustice. Motivated by our Christian faith, World Vision is dedicated to working with the world's most vulnerable people. World Vision serves all people regardless of religion, race, ethnicity or gender.

Fact Sheets: The Asia-Pacific fact sheet series is a joint initiative by regional World Vision players. Partnering together, Advocacy, Communications and Humanitarian and Emergency Affairs (HEA) are aiming to position for heightened disaster preparedness in the Asia-Pacific region.

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