Foreword

The year 2005 witnessed several severe natural disasters around the world. The South Asian Earthquake that struck India and Pakistan yielded the highest death toll, the floods in India and China affected the greatest number of people, and Hurricanes Katrina and Wilma in the US produced the most extensive economic damage. The South Asian Earthquake severely impacted the development and economic advancement of Pakistan and India, and floods and torrential rains in India and China caused serious damages in those countries. Consequently, these disasters affected the entire Asian region and posed severe setbacks to economic development. Droughts were also experienced in many African countries in 2005, resulting in extensive human sufferings and economic damage. Even more unexpectedly, Europe experienced floods and extreme temperatures, as it had in 2004, which claimed a considerable number of human lives and caused extensive suffering in the region. Oceania also experienced severe storms and volcanic activities that affected many people and caused significant economic damage.

These natural disasters have clearly had serious consequences for human society, national economies, and the global environment. The exponential increase in economic losses associated with natural hazards in the developing countries has posed a considerable obstacle to development. Thus, the devastation caused by natural disasters and the economic uncertainties they create have had an adverse effect on the ability of developing countries to compete in the global economy. The statistics for the last 30 years clearly show that Asia is the most disaster-afflicted region in the world, accounting for about 90% of all those affected by disasters, and more than 50% of the total deaths and economic losses. It is therefore imperative that we analyze past disasters and look at annual trends from the perspective of development mechanisms.

We have compiled this publication to analyze the natural disaster trends in the year 2005 for the purpose of accelerating and strengthening global and regional socio-economic frameworks for addressing the consequences of natural disasters and designing effective disaster reduction mechanisms. We hope this publication will be of use not only to policy planners, researchers, and scholars, but also to grass-roots level promoters of development initiatives. We sincerely hope that this data book will further our efforts to transform the total disaster risk management approach into an instrument for global sustainable development.

March 2006

Asian Disaster Reduction Center

Note 1:

The disasters analyzed here are from CRED EM-DAT database. For a disaster to be entered into this database, at least one of the following criteria must be satisfied.

(i) 10 or more people reported killed

(ii) 100 or more people reported affected

(iii) declaration of a state of emergency

(iv) call for international assistance

Note 2:

Notation used	Description
(1). DisType	= Types of Disasters
(2) Dis Classification	= Disaster Classification
(3). Count of DisNo	= Total number of disasters
(4). Sum of Killed	= Total number of people killed
(5). Sum of Injured	= Total number of people injured
(6). Sum of Homeless	= Total number of people left homeless
(7). Sum of Affected	= Total number of affected people
(8). Sum of TotAff	= Total affected people
	= (5) + (6) + (7)
(9). Sum of Damage	= Amount of damage

Note 3:

Income Classifications According to the World Bank

Income Classification	Income Level (US$, annually)
High	9,266 and above
Upper Middle	from 2,996 to 9,265
Lower Middle	from 756 to 2,995
Low	up to 755

Reference: World Bank list of economics (July 2006)

http://siteresources.worldbank.org/DATASTATISTICS/Resources/CLASS.XLS

Human Development Level Classifications According to the UNDP.

Human Development Level	Index
High	0.8 ~ 1.0
Medium	0.5 ~ 0.79
Low	0.0 ~ 0.49

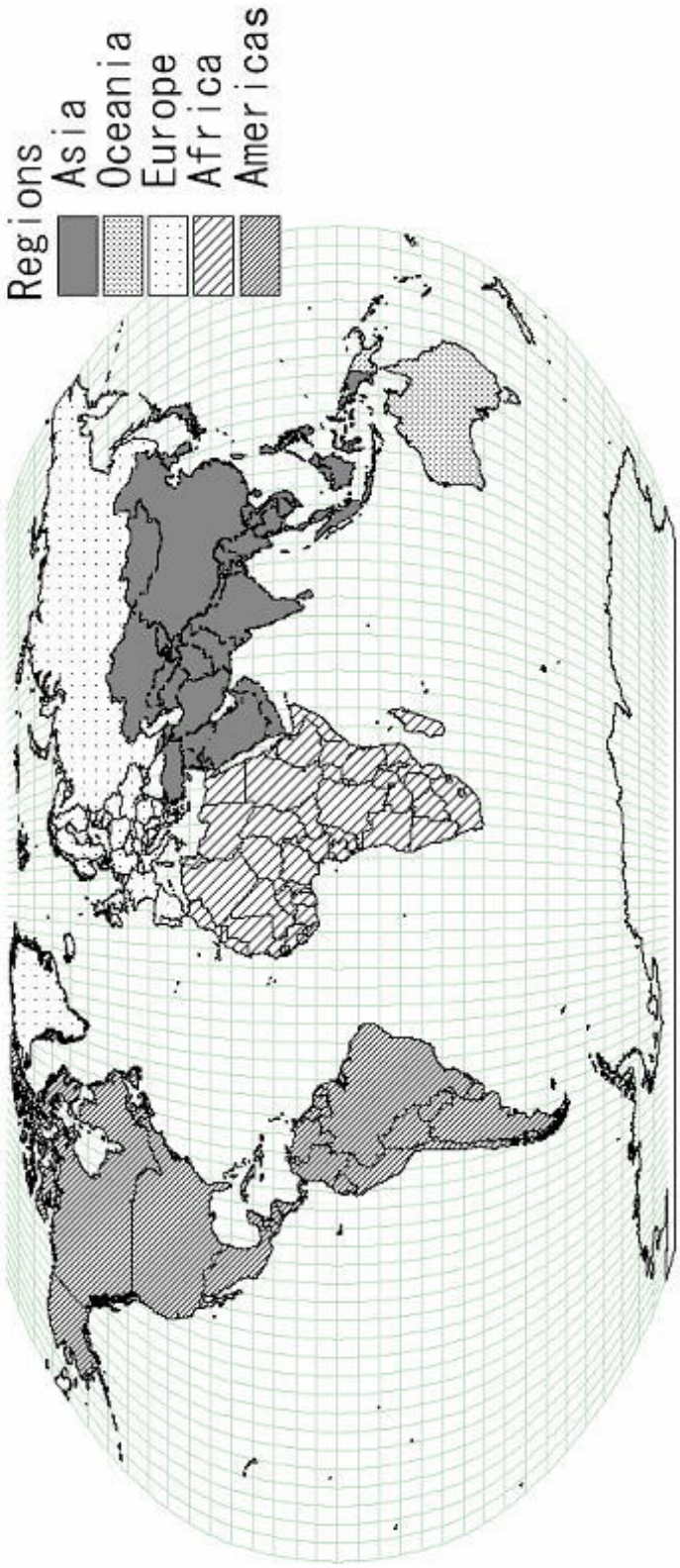
Reference: Human Development Report (UNDP)

http://hdr.undp.org/reports/global/2005/pdf/presskit/HDR05_PKE_HDI.pdf#search=%22HDI%22

CONTENTS

Natural Disasters in 2005: An Analytical Overview

The Regions of the World



Natural Disasters in 2005: An Analytical Overview

Chapter 1: Impact of Natural Disasters

This chapter deals with the overall trends in natural disasters and their impacts for the year 2005. It also addresses regional perspectives on disasters based on disaster types and discusses the vulnerability of natural disasters, especially in the Asian region.

1.1 Trends in Natural Disaster Damage and Characteristics

The following figures (Figures 1, 2, and 3) and summary tables (Tables 1A, 1B, 2A, 2B, 3A, and 3B) indicate an increasing trend in the occurrence of natural disasters. This is due to various factors, such as global climate change, environmental and ecological imbalances, increasing population density, ad-hoc urbanization, deforestation, and desertification. Compounded by these factors, natural disasters are resulting in an increased level of human suffering, loss of life, and economic losses. It is noteworthy to mention that the worldwide *total*[1] affected population in the year 2005 was about 2.4% of the world population (an increase of 0.1% over 2004) and the total worldwide economic damage in the year 2005 exceeded the GDP (purchasing power parity)[2] of certain developing countries in the Asia-Pacific and Africa, underscoring the importance of natural disaster mitigation strategies in these regions. For instance, the total amount of damage worldwide caused by natural disasters in the year 2005 was 30 times the annual GDP (PPP, 2005 estimate) of Mongolia, 13 times that of Laos, 18 times that of Tajikistan, 12 times that of Armenia, 13 times that of Kyrgyz, 11 times that of Papua New Guinea, 14 times that of Niger, and 28 times that of Swaziland. This is quite a large increase when compared against 2004. There was an alarming increase in the number of disasters that occurred (20.2%), the number of total affected people (8.8%), and the amount of economic damage incurred (61.6%). But the number of people killed fell by 62.0% from 2004 to 2005. Figures in 2004 were mainly due to the Indian Ocean Tsunami and its effects in many countries of Asia and Africa. Asia again suffered significant losses of life this year due to the South Asian Earthquake in Pakistan and India, the event responsible for a significant portion of the human losses in Asia. The statistics show that almost 91% of the people killed worldwide are in Asia. This clearly underscores the vulnerability of the region. Further, USA experienced one of the severest economic damages this

[1] According to CRED, Belgium, the *total* affected population includes the number of people injured, number of people became homeless and number of people affected by various other means due to disasters.

year due to Hurricanes Katrina, Wilma, and others. This trend is quite alarming and represents a considerable obstacle to any development activities in the affected countries from the perspective of sustainable development. Human suffering and economic losses undeniably create a development-vacuum that will be hard to fill in the near future.

Table 1A: Summary of Natural Disasters, 1975-2005

Continent	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Asia	3,107 (37.35%)	1,251,911 (57.19%)	4,47,825,623 (88.87%)	550,630,595 (44.02%)
World	8,319	2,189,116	5,342,323,780	1,250,829,365

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 1B: Summary of Natural Disasters, 2005

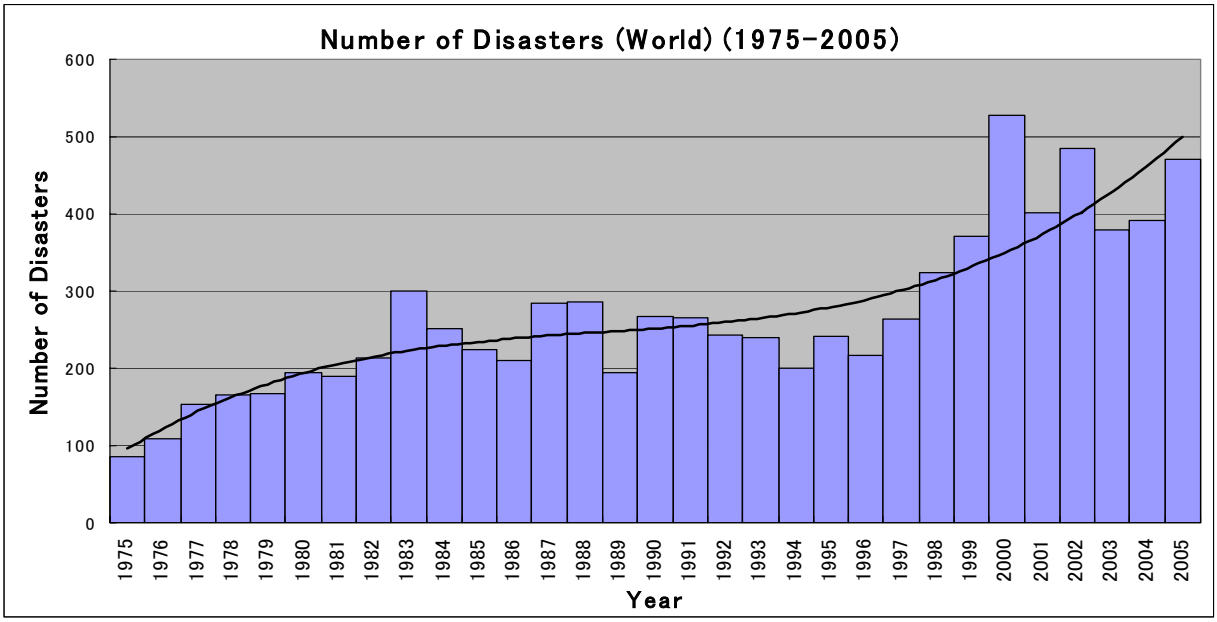
	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Asia	175 (37.15%)	84,354 (90.97%)	131,273,322 (83.04%)	18,816,218 (11.84%)
World	471	92,731	158,081,461	158,932,870

Source: CRED-EMDAT, Université Catholique de Louvain , Brussels, Belgium, 2005

The following figures show the increasing trend in natural disasters, the number of total affected people, and the amount of damage from 1975 to 2005.

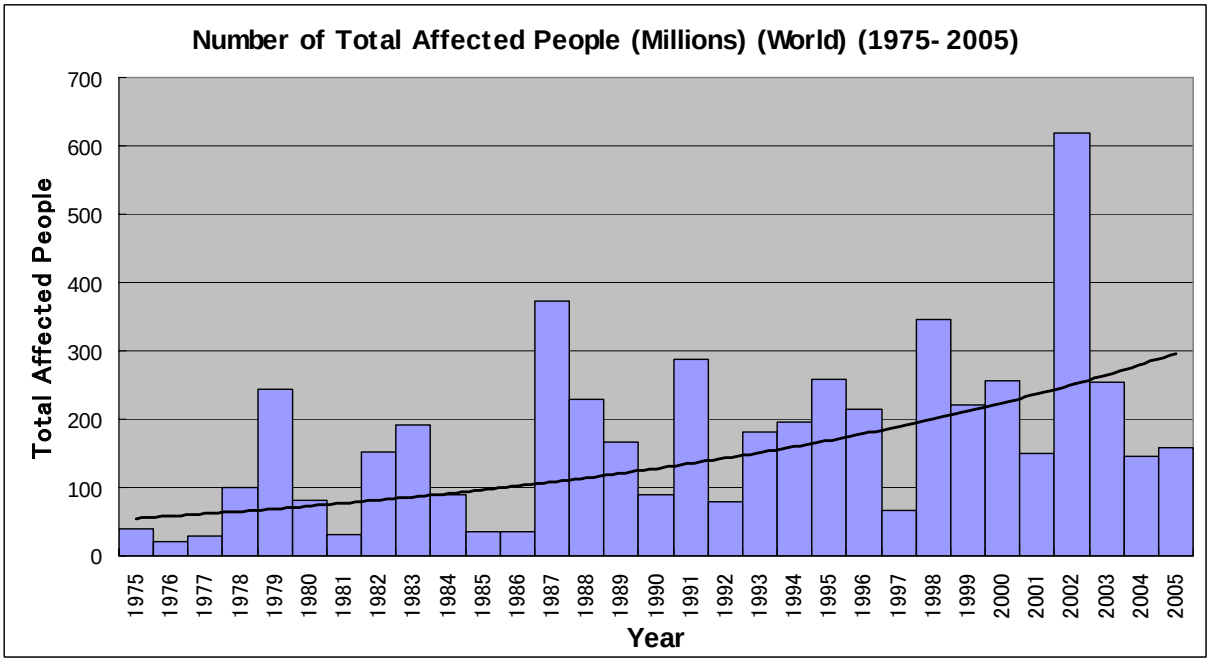
[2] We used GDP (PPP) 2005 estimate data from the World Fact Book.

Figure 1 Number of Disasters, 1975-2005 (World)



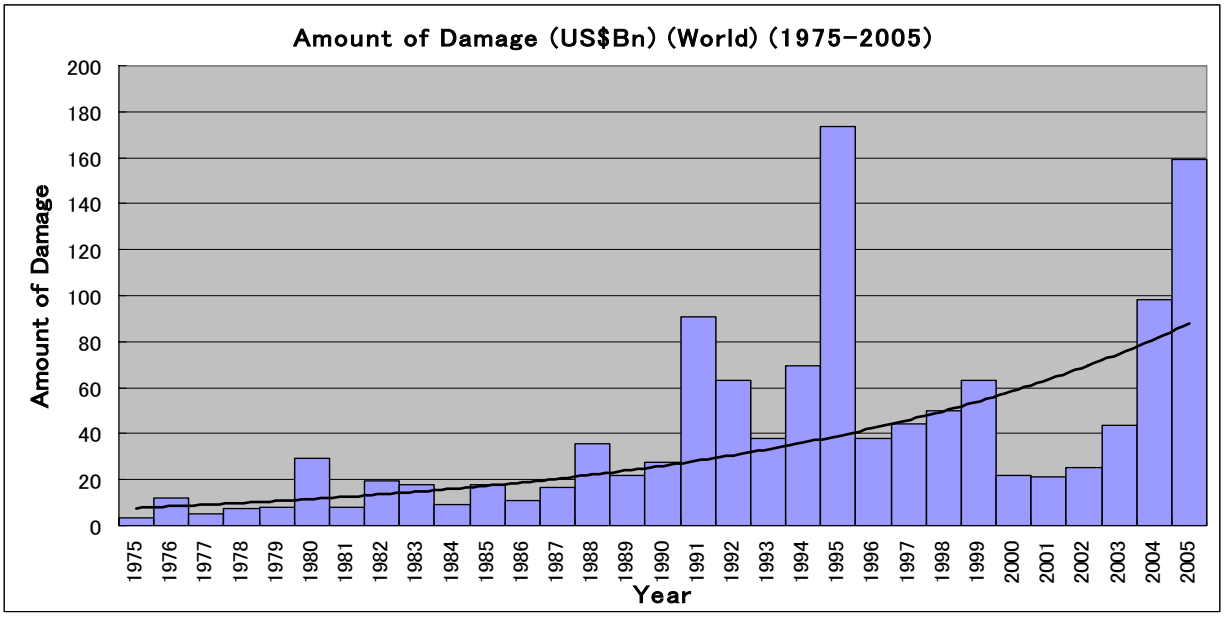
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 2 Number of Total Affected People (Millions), 1975-2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 3 Amount of Damage (US$ Billions), 1975-2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

The following tables show regional disaster characteristics in relation to various types of disaster for the periods 1975-2005. Tables 2A and 3A in particular show this trend for the 31 years from 1975-2005 while Tables 2B and 3B show figures for 2005 only.

Table 2A: Summary of Natural Disasters by Region, 1975-2005

Continent	DisType	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Africa	Drought	322	560,493	296,505,049	4,051,193
	Earthquake	53	6,711	1,514,821	8,725,608
	Epidemic	502	106,605	10,302,605	4,730
	Extreme temp	10	218	1,000,218	47,809
	Famine (natural)	34	6,087	31,607,592	89,000
	Flood	453	14,162	33,849,679	3,035,314
	Insect infestation	68		446,000	5,200
	Slide	23	528	18,304	
	Volcano	12	2,152	461,160	
	Wave / Surge	4	312	109,913	30,000
	Wild fire	14	120	16,710	3,500
	Wind storm	136	3,350	11,109,022	2,796,873
Africa Total		**1,631**	**700,738**	**386,941,073**	**18,789,227**
Americas	Drought	96	79	50,069,164	13,057,539
	Earthquake	151	43,311	11,710,574	56,647,010
	Epidemic	72	14,346	1,626,410	
	Extreme temp	62	5,203	4,089,468	13,911,250
	Famine (natural)	2		1,003,000	
	Flood	609	50,366	43,119,548	51,923,597
	Insect infestation	3		2,000	104,000
	Slide	110	5,189	1,163,028	1,085,200
	Volcano	49	22,005	1,229,912	1,879,022
	Wave / Surge	5	1,274	8,844	
	Wild fire	97	155	362,617	5,566,700
	Wind storm	669	38,673	42,953,618	305,207,601
Americas Total		**1,925**	**180,601**	**157,338,183**	**449,381,919**
Asia	Drought	136	3,928	1,405,215,138	13,562,391
	Earthquake	386	551,228	70,679,577	248,097,687
	Epidemic	232	44,873	6,713,931	
	Extreme temp	103	19,080	50,711,638	5,042,887
	Famine (natural)	10	760	8,670,000	4,399
	Flood	1,009	131,523	2,627,676,430	161,095,953
	Insect infestation	9		200	925
	Slide	225	15,181	5,473,151	463,888
	Volcano	56	1,424	2,139,814	579,149
	Wave / Surge	22	231,869	2,338,995	7,782,397
	Wild fire	59	450	3,245,885	19,235,500
	Wind storm	860	251,595	564,960,864	94,765,419
Asia Total		**3,107**	**1,251,911**	**4,747,825,623**	**550,630,595**
Europe	Drought	30		7,062,575	14,190,736
	Earthquake	156	8,704	2,829,742	34,349,776
	Epidemic	28	476	186,089	
	Extreme temp	127	35,260	787,774	2,316,088
	Famine (natural)	2		3,210,000	
	Flood	336	3,065	7,444,055	123,312,165
	Insect infestation	1			
	Slide	47	1,173	39,299	1,669,389
	Volcano	16	9	7,024	19,600
	Wave / Surge	1	11	2	
	Wild fire	80	318	132,587	3,118,249
	Wind storm	290	1,948	8,640,518	28,547,948
Europe Total		**1,114**	**50,964**	**30,339,665**	**207,523,951**
Oceania	Drought	24	98	8,653,635	11,006,000
	Earthquake	86	585	81,287	2,507,400
	Epidemic	7	288	4,850	
	Extreme temp	4	23	4,600,784	
	Flood	143	243	517,922	2,108,437
	Insect infestation	1			120,000
	Slide	17	431	10,615	2,466
	Volcano	12	9	226,501	400,000
	Wave / Surge	2	2,382	9,867	
	Wild fire	31	130	76,169	1,082,006
	Wind storm	215	713	5,697,606	7,277,364
Oceania Total		**542**	**4,902**	**19,879,236**	**24,503,673**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 2B: Summary of Natural Disasters by Region, 2005

Continent	DisType	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Africa	Drought	14	149	17,114,000	
	Earthquake	3	10	6,558	
	Epidemic	33	2,336	98,412	
	Flood	31	384	709,135	8,456
	Volcano	2	1	284,000	
	Wind storm	6	128	11,845	
Africa Total		**89**	**3,008**	**18,223,950**	**8,456**
Asia	Drought	5		8,784,000	292,120
	Earthquake	14	76,211	3,887,589	5,080,000
	Epidemic	11	808	6,857	
	Extreme temp	6	715	1,400	
	Flood	83	4,770	70,067,898	9,666,787
	Slide	8	596	7,010	
	Volcano	1		26,000	
	Wild fire	4		2,140	
	Wind storm	43	1,254	48,490,428	3,777,311
Asia Total		**175**	**84,354**	**131,273,322**	**18,816,218**
Americas	Drought	2		52,990	
	Earthquake	3	17	30,901	
	Extreme temp	1	33	31	
	Flood	33	514	822,686	1,417,430
	Slide	2	29	1,333	
	Volcano	2	2	2,000	
	Wild fire	5	5	4,410	
	Wind storm	44	3,199	7,105,549	134,590,745
Americas Total		**92**	**3,799**	**8,019,900**	**136,008,175**
Europe	Earthquake	3	2	3,044	
	Extreme temp	29	1,272	9,785	155,188
	Flood	42	181	116,956	3,245,833
	Slide	2	24	9	
	Wild fire	2	26	137	
	Wind storm	22	34	406,111	500,000
Europe Total		**100**	**1,539**	**536,042**	**3,901,021**
Oceania	Earthquake	1	1	200	
	Flood	3	1	2,893	100,000
	Volcano	2		20,000	
	Wild fire	1	16	220	40,000
	Wind storm	8	13	4,934	59,000
Oceania Total		**15**	**31**	**28,247**	**199,000**
Grand Total		**471**	**92,731**	**158,081,461**	**158,932,870**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 3A: Summary of Natural Disasters by Disaster Type, 1975-2005

DisType	Continent	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Drought	Africa	322	560,493	296,505,049	4,051,193
	Americas	96	79	50,069,164	13,057,539
	Asia	136	3,928	1,405,215,138	13,562,391
	Europe	30	0	7,062,575	14,190,736
	Oceania	24	98	8,653,635	11,006,000
Drought Total		**608**	**564,598**	**1,767,505,561**	**55,867,859**
Earthquake	Africa	53	6,711	1,514,821	8,725,608
	Americas	151	43,311	11,710,574	56,647,010
	Asia	386	551,228	70,679,577	248,097,687
	Europe	156	8,704	2,829,742	34,349,776
	Oceania	86	585	81,287	2,507,400
Earthquake Total		**832**	**610,539**	**86,816,001**	**350,327,481**
Epidemic	Africa	502	106,605	10,302,605	4,730
	Americas	72	14,346	1,626,410	
	Asia	232	44,873	6,713,931	
	Europe	28	476	186,089	
	Oceania	7	288	4,850	
Epidemic Total		**841**	**166,588**	**18,833,885**	**4,730**
Extreme temp	Africa	10	218	1,000,218	47,809
	Americas	62	5,203	4,089,468	13,911,250
	Asia	103	19,080	50,711,638	5,042,887
	Europe	127	35,260	787,774	2,316,088
	Oceania	4	23	4,600,784	
Extreme temp Total		**306**	**59,784**	**61,189,882**	**21,318,034**
Famine (natural)	Africa	34	6,087	31,607,592	89,000
	Americas	2		1,003,000	
	Asia	10	760	8,670,000	4,399
	Europe	2		3,210,000	
Famine (natural) Total		**48**	**6,847**	**44,490,592**	**93,399**
Flood	Africa	453	14,162	33,849,679	3,035,314
	Americas	609	50,366	43,119,548	51,923,597
	Asia	1,009	131,523	2,627,676,430	161,095,953
	Europe	336	3,065	7,444,055	123,312,165
	Oceania	143	243	517,922	2,108,437
Flood Total		**2,550**	**199,359**	**2,712,607,634**	**341,475,466**
Insect infestation	Africa	68		446,000	5,200
	Americas	3		2,000	104,000
	Asia	9		200	925
	Europe	1			
	Oceania	1			120,000
Insect infestation Total		**82**		**448,200**	**230,125**
Slide	Africa	23	528	18,304	
	Americas	110	5,189	1,163,028	1,085,200
	Asia	225	15,181	5,473,151	463,888
	Europe	47	1,173	39,299	1,669,389
	Oceania	17	431	10,615	2,466
Slide Total		**422**	**22,502**	**6,704,397**	**3,220,943**
Volcano	Africa	12	2,152	461,160	
	Americas	49	22,005	1,229,912	1,879,022
	Asia	56	1,424	2,139,814	579,149
	Europe	16	9	7,024	19,600
	Oceania	12	9	226,501	400,000
Volcano Total		**145**	**25,599**	**4,064,411**	**2,877,771**
Wave / Surge	Africa	4	312	109,913	30,000
	Americas	5	1,274	8,844	
	Asia	22	231,869	2,338,995	7,782,397
	Europe	1	11	2	
	Oceania	2	2,382	9,867	
Wave / Surge Total		**34**	**235,848**	**2,467,621**	**7,812,397**
Wild fire	Africa	14	120	16,710	3,500
	Americas	97	155	362,617	5,566,700
	Asia	59	450	3,245,885	19,235,500
	Europe	80	318	132,587	3,118,249
	Oceania	31	130	76,169	1,082,006
Wild fire Total		**281**	**1,173**	**3,833,968**	**29,005,955**
Wind storm	Africa	136	3,350	11,109,022	2,796,873
	Americas	669	38,673	42,953,618	305,207,601
	Asia	860	251,595	564,960,864	94,765,419
	Europe	290	1,948	8,640,518	28,547,948
	Oceania	215	713	5,697,606	7,277,364
Wind storm Total		**2,170**	**296,279**	**633,361,628**	**438,595,205**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 3B: Summary of Natural Disasters by Disaster Type, 2005

DisType	Continent	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Drought	Africa	14	149	17,114,000	
	Asia	5		8,784,000	292,120
	Americas	2		52,990	
Drought Total		**21**	**149**	**25,950,990**	**292,120**
Earthquake	Africa	3	10	6,558	
	Asia	14	76,211	3,887,589	5,080,000
	Americas	3	17	30,901	
	Europe	3	2	3,044	
	Oceania	1	1	200	
Earthquake Total		**24**	**76,241**	**3,928,292**	**5,080,000**
Epidemic	Africa	33	2,336	98,412	
	Asia	11	808	6,857	
Epidemic Total		**44**	**3,144**	**105,269**	
Extreme temp	Asia	6	715	1,400	
	Americas	1	33	31	
	Europe	29	1,272	9,785	155,188
Extreme temp Total		**36**	**2,020**	**11,216**	**155,188**
Flood	Africa	31	384	709,135	8,456
	Asia	83	4,770	70,067,898	9,666,787
	Americas	33	514	822,686	1,417,430
	Europe	42	181	116,956	3,245,833
	Oceania	3	1	2,893	100,000
Flood Total		**192**	**5,850**	**71,719,568**	**14,438,506**
Slide	Asia	8	596	7,010	
	Americas	2	29	1,333	
	Europe	2	24	9	
Slide Total		**12**	**649**	**8,352**	
Volcano	Africa	2	1	284,000	
	Asia	1		26,000	
	Americas	2	2	2,000	
	Oceania	2		20,000	
Volcano Total		**7**	**3**	**332,000**	
Wild fire	Asia	4		2,140	
	Americas	5	5	4,410	
	Europe	2	26	137	
	Oceania	1	16	220	40,000
Wild fire Total		**12**	**47**	**6,907**	**40,000**
Wind storm	Africa	6	128	11,845	
	Asia	43	1,254	48,490,428	3,777,311
	Americas	44	3,199	7,105,549	134,590,745
	Europe	22	34	406,111	500,000
	Oceania	8	13	4,934	59,000
Wind storm Total		**123**	**4,628**	**56,018,867**	**138,927,056**
Grand Total		**471**	**92,731**	**158,081,461**	**158,932,870**

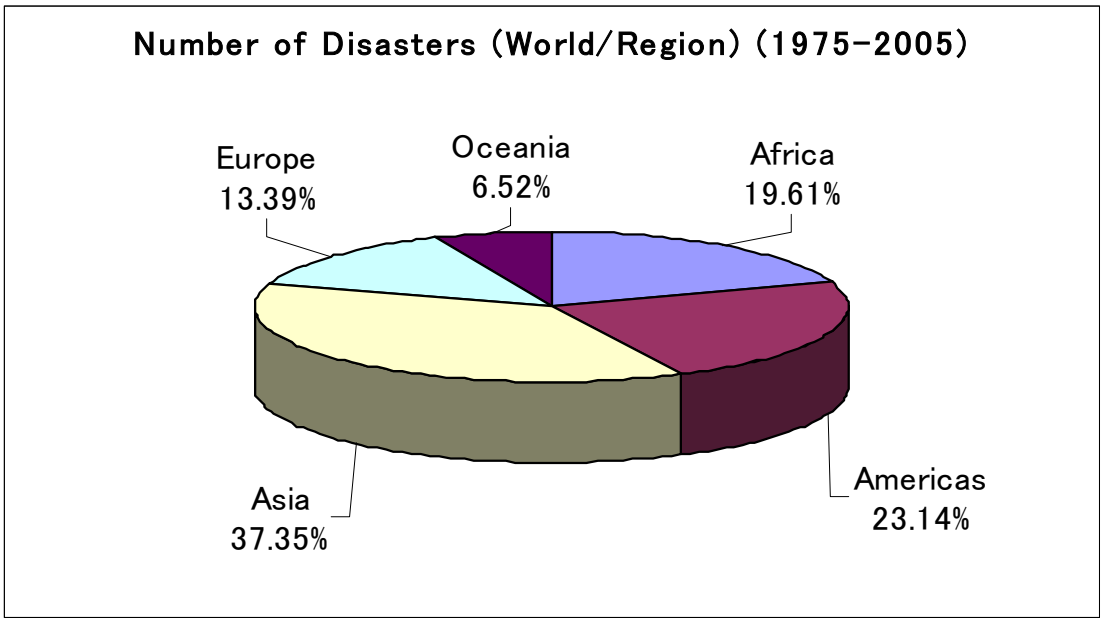
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

1.2 Regional Vulnerability: Disaster-Prone Asia

The year 2004 was a particularly disastrous year for Asia due to the Indian Ocean Tsunami as well as other earthquakes, wind storms, and floods. The year 2005 was likewise disastrous as a result of the South Asian earthquake, which accounted for almost 91% of the disaster-related human losses in the world. The statistics make the region's vulnerability to natural disasters quite evident. The majority of human losses and suffering, but not the majority of economic losses, were reported in this region in 2005, as had been the case in previous years. Specifically, nearly 83% (down 3% from 2004) of the total affected people and 91% (down 5% from 2004) of the human losses were reported in Asia. However, only 11.8% of the reported economic damage came from Asia.

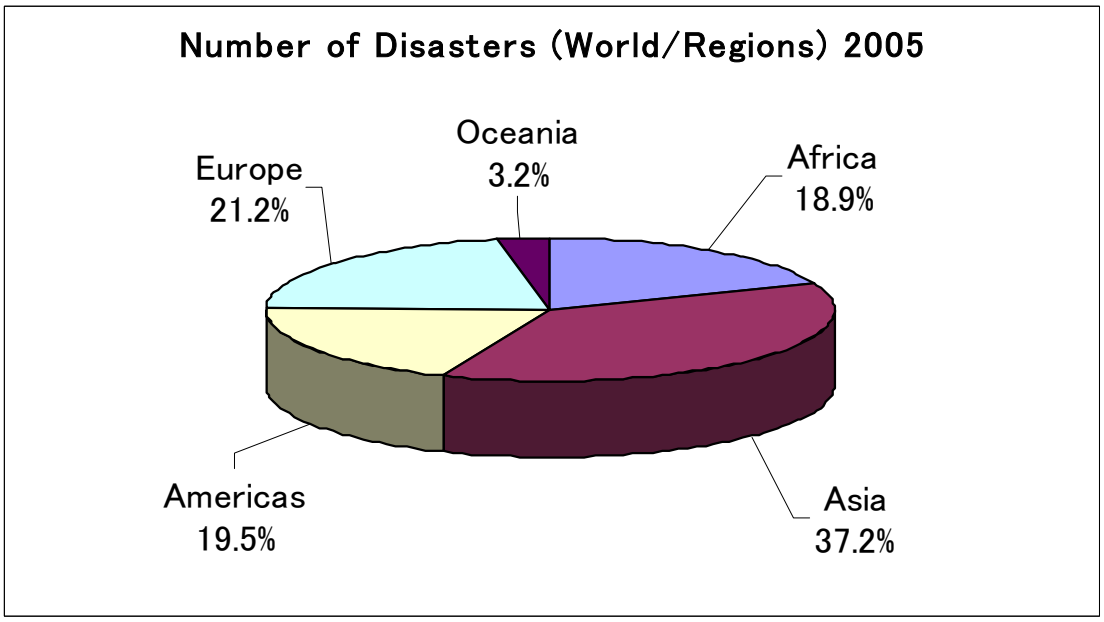
Furthermore, in 2005, the majority of economic losses caused by disasters happened in the Americas, followed by Asia, Europe, and Oceania. These losses were due to the natural disasters that hit India and Pakistan (earthquakes and flood), China (wind storms and floods), the US (windstorms and Hurricanes Katrina, Wilma, and others), and Bangladesh (floods and wind storms). The South Asian earthquake highlighted for the world the region’s vulnerability to such a disaster. In contrast, outside of Asia, the second largest death toll was reported in the US, and was due to the wind storms (Hurricanes Katrina, Wilma, and others) that affected the country. This year, Africa was subjected to epidemics, floods, and droughts which affected millions of people in the region. Like last year, Europe again experienced extreme temperatures, floods, and wind storms which caused considerable human and economic losses. The year 2005 was better for Europe than for some other regions. The following figures from 4A to 7B show the regional trends for 2005 as well as for the period 1975-2005. Figures 8A to 11C show trends by disaster type for 2005 and for the 1975-2005 period, for the world and the Asian region. We have included figures not only for the year 2005, but also for the 31-year period from 1975 to 2005. This will provide a better understanding of the situation and a useful basis for comparison.

Figure 4A Proportion of Disasters by Region, 1975-2005



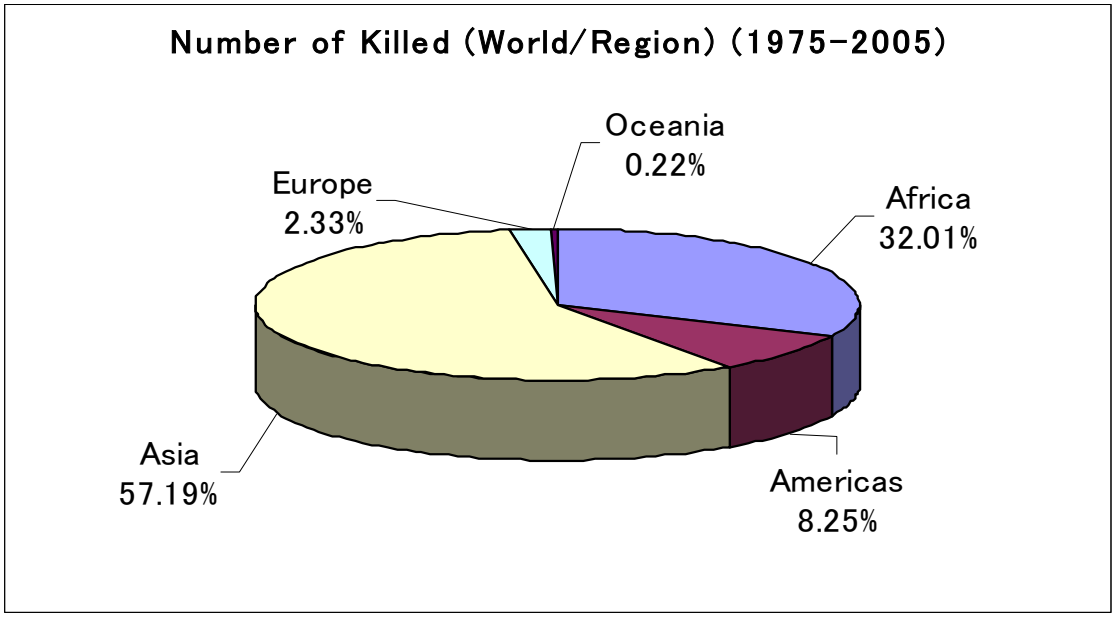
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 4B Proportion of Disasters by Region, 2005



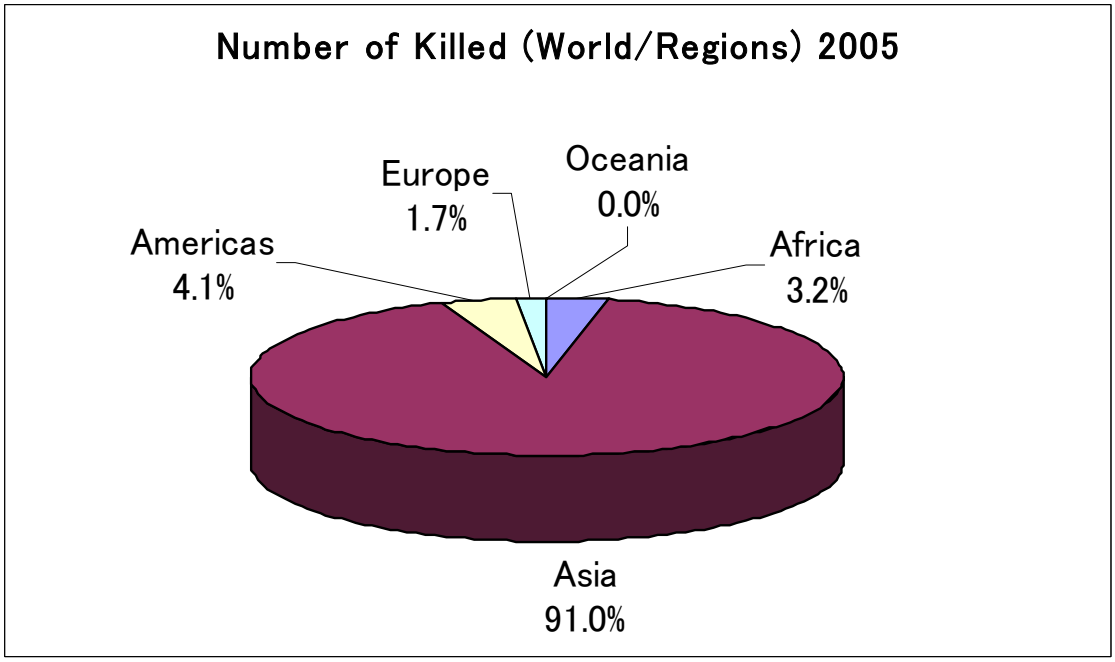
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 5A Proportion of People Killed by Region, 1975-2005



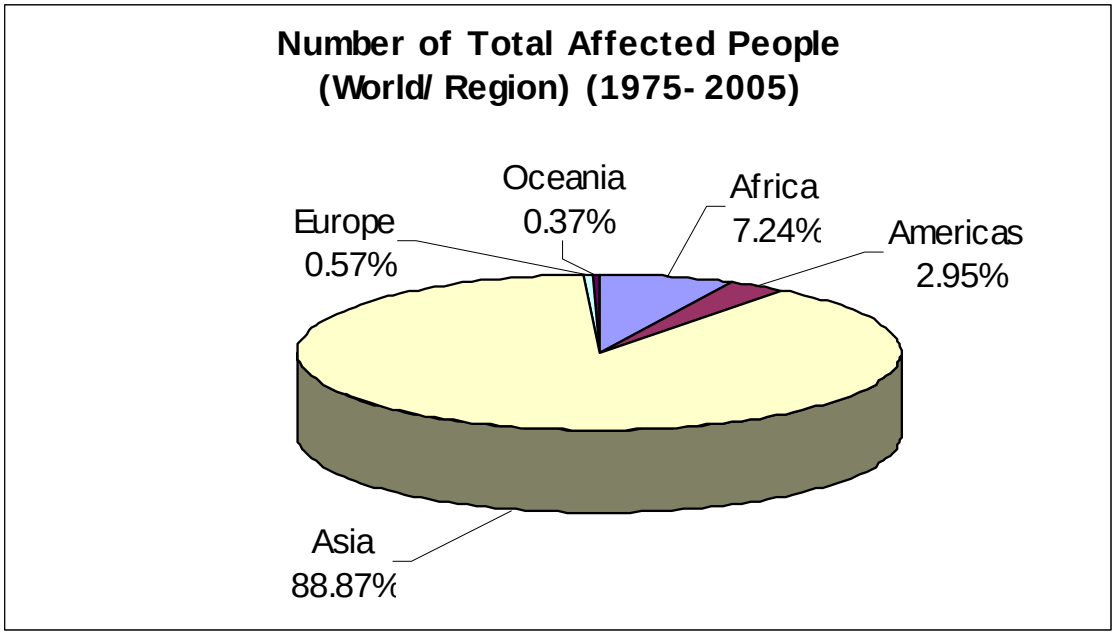
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 5B Proportion of People Killed by Region, 2005



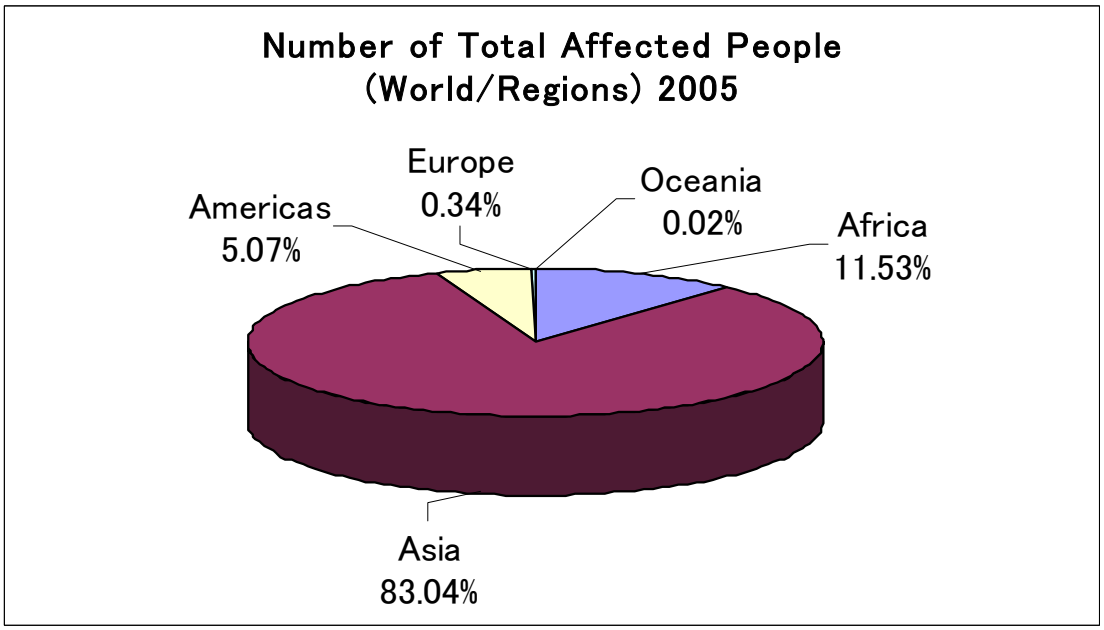
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 6A Proportion of Total Affected People by Region, 1975-2005



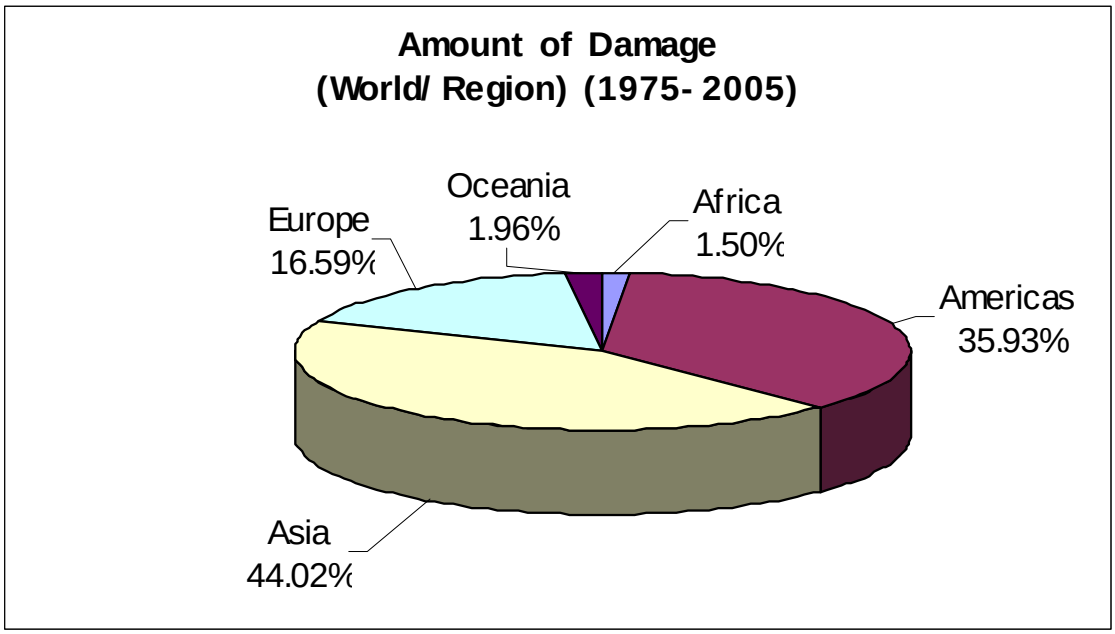
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 6B Proportion of Total Affected People by Region, 2005



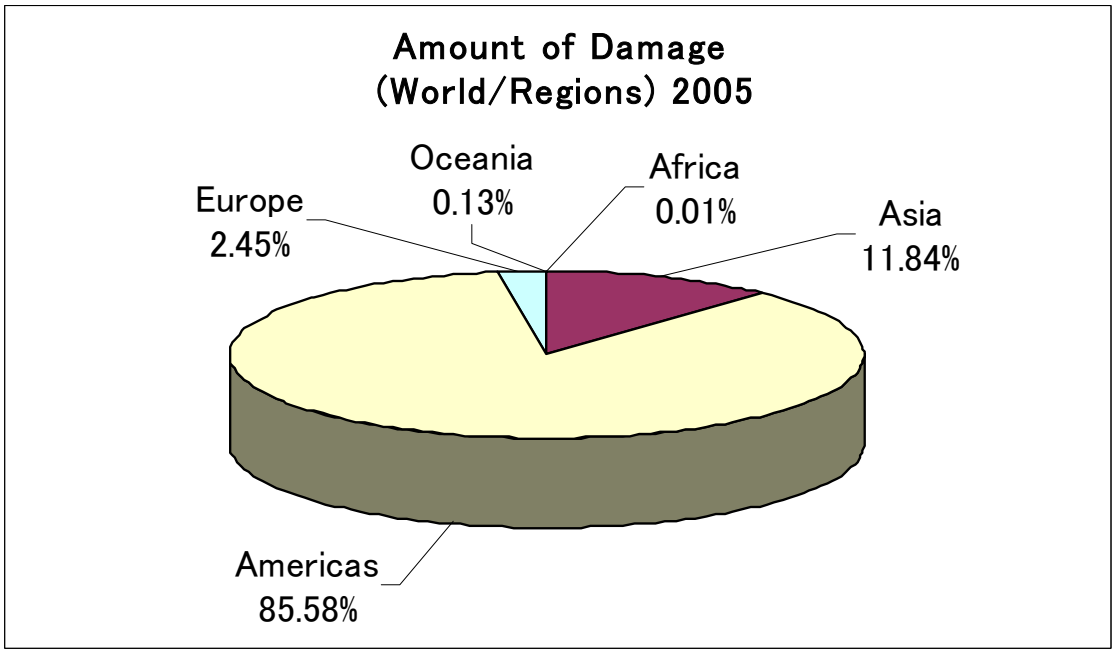
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 7A Proportion of Damage by Region, 1975-2005



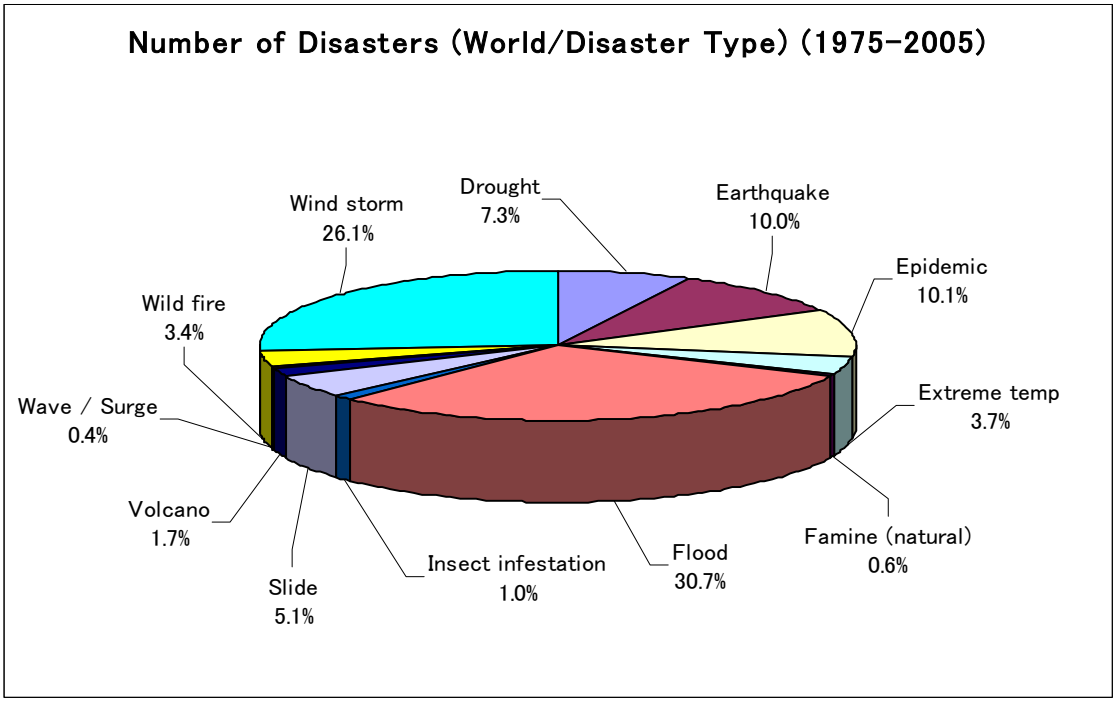
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 7B Proportion of Damage by Region, 2005



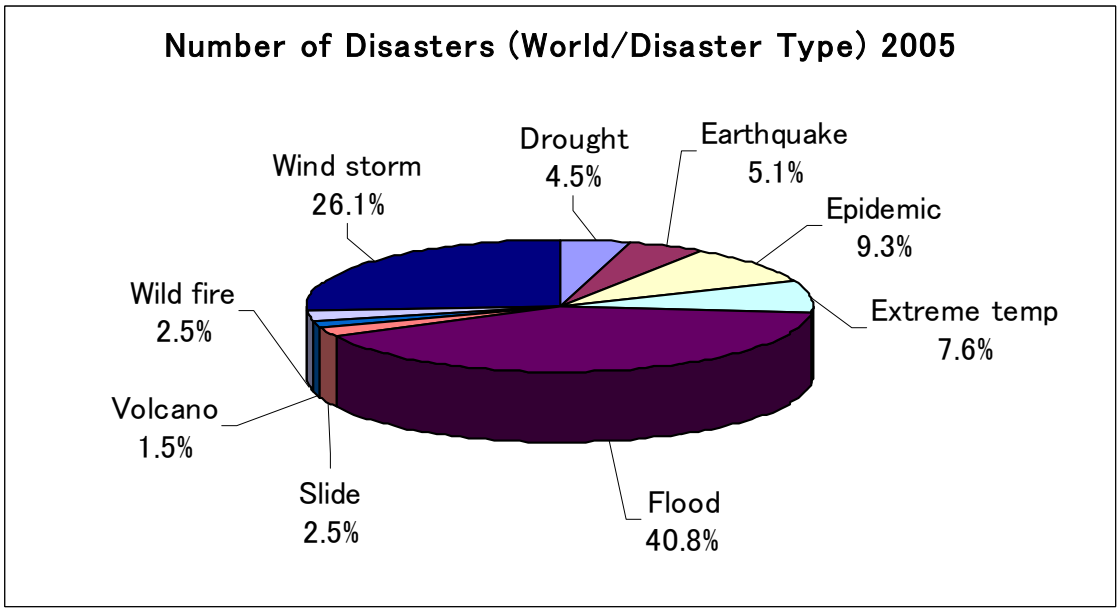
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 8A Proportion of Disasters Worldwide by Type, 1975-2005



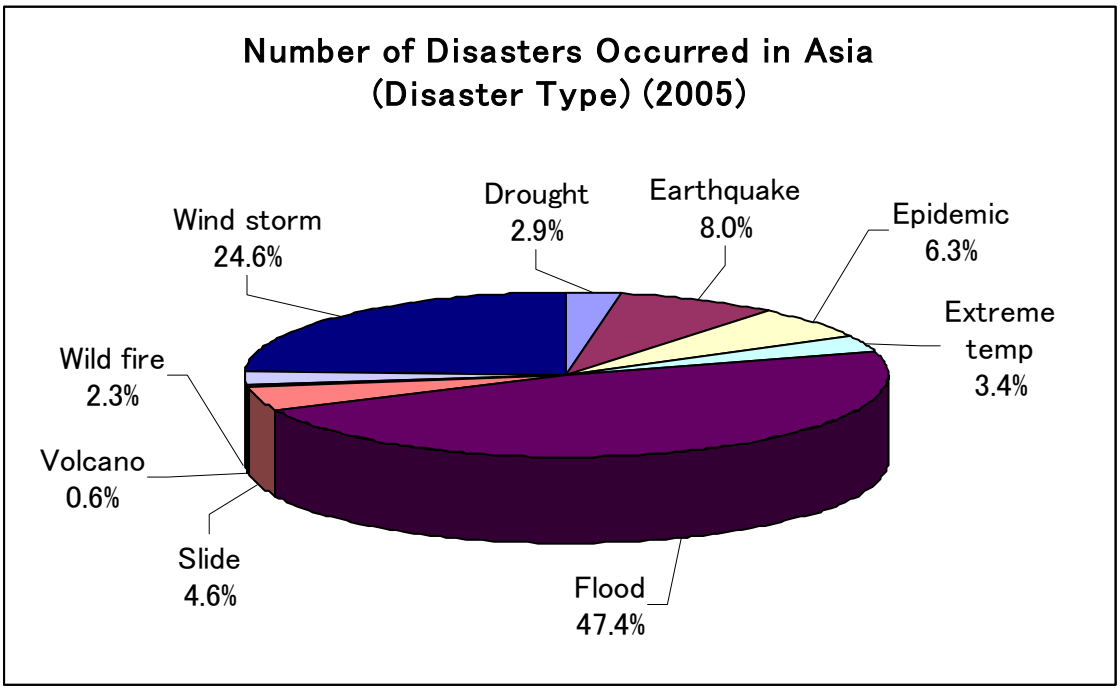
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 8B Proportion of Disasters Worldwide by Type, 2005



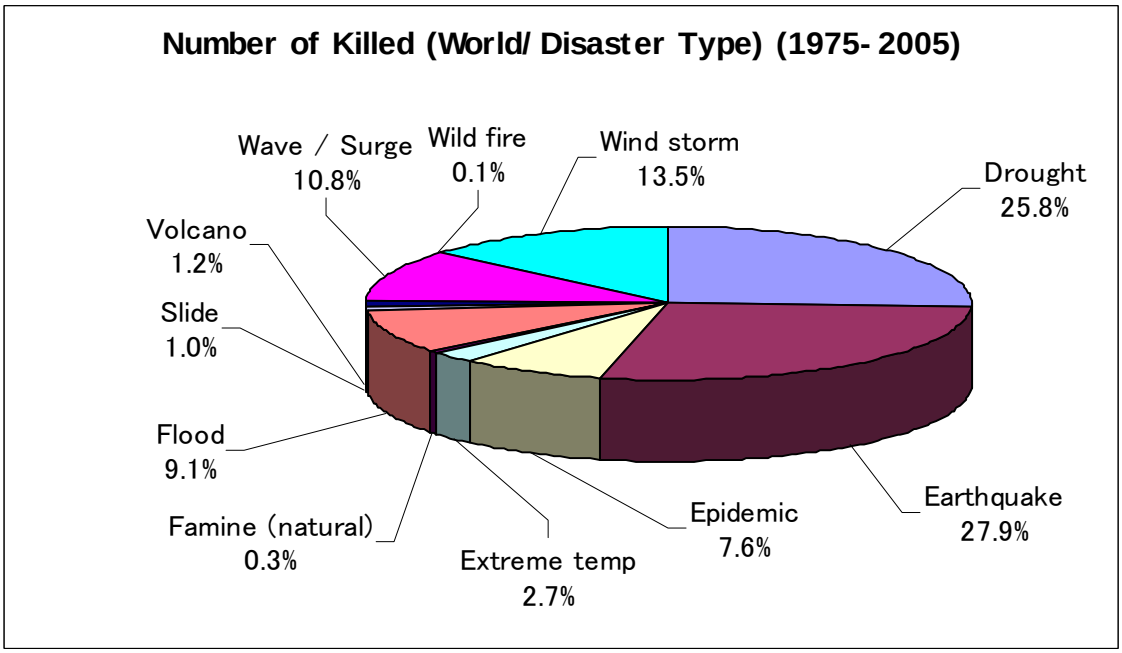
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 8C Proportion of Disasters in Asia by Type, 1975-2005



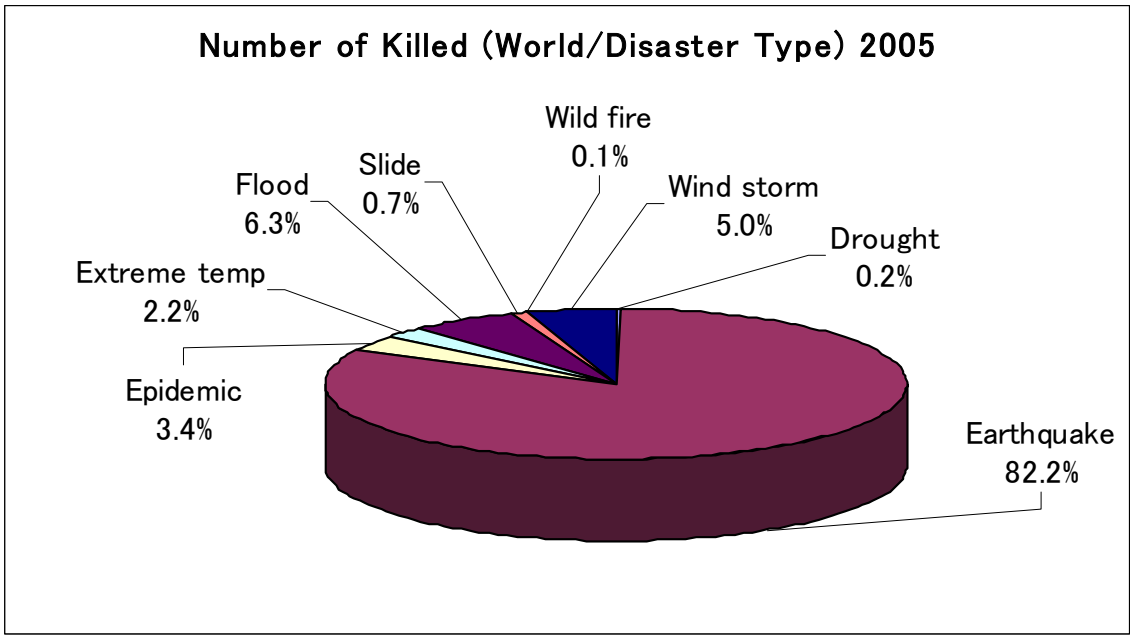
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 9A Proportion of People Killed Worldwide by Type of Disaster, 1975-2005



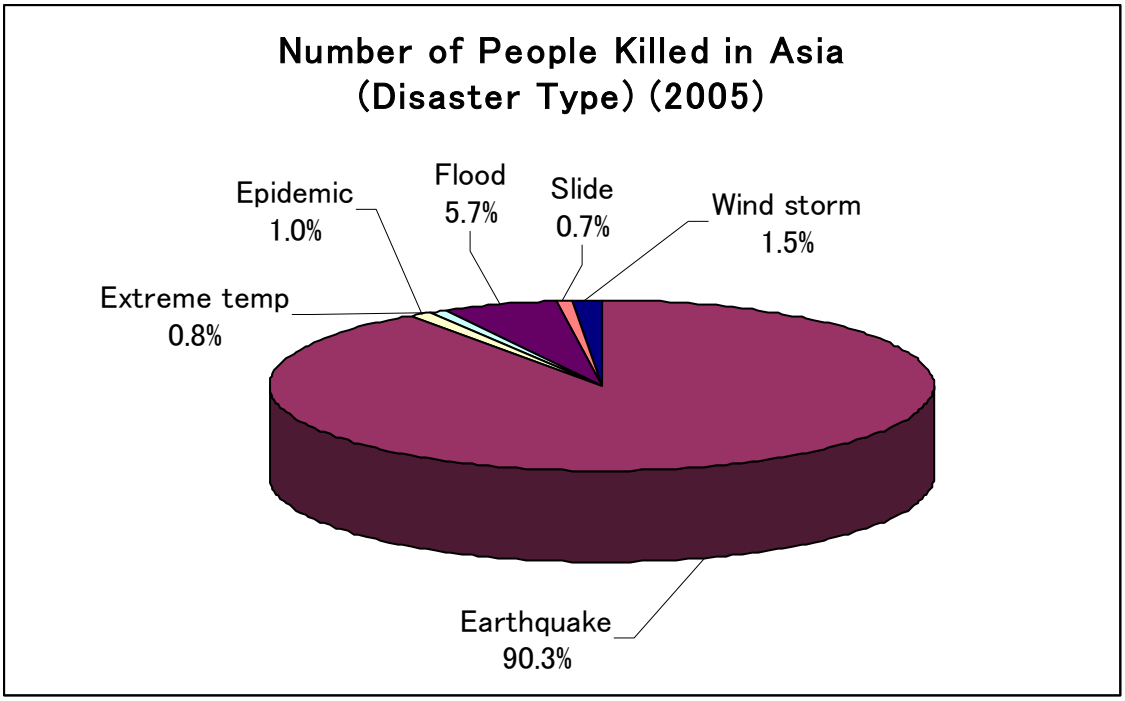
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 9B Proportion of People Killed Worldwide by Type of Disaster, 2005



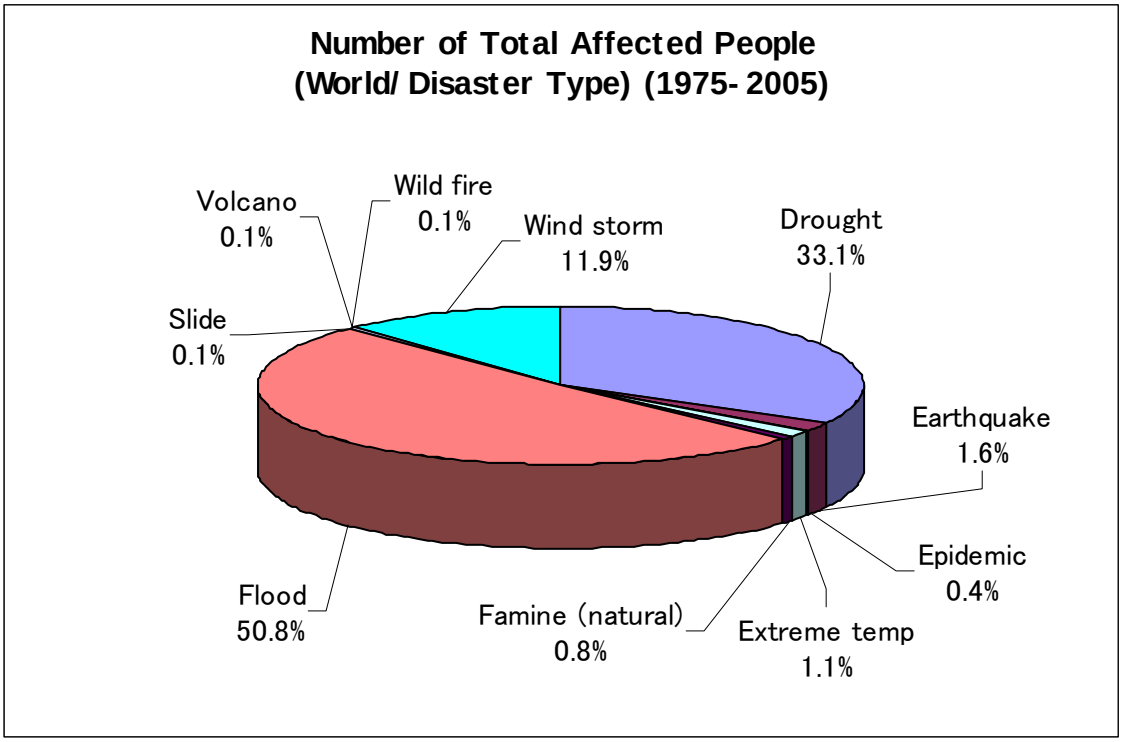
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 9C Proportion of People Killed in Asia by Type of Disaster, 2005



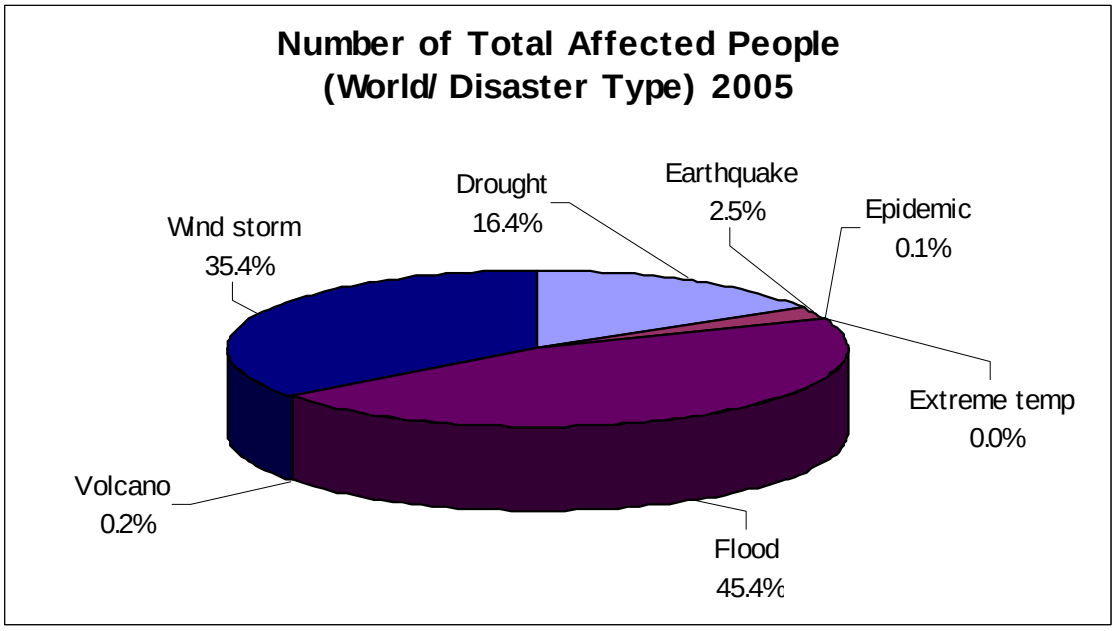
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 10A Proportion of Total Affected People Worldwide by Type of Disaster, 1975-2005



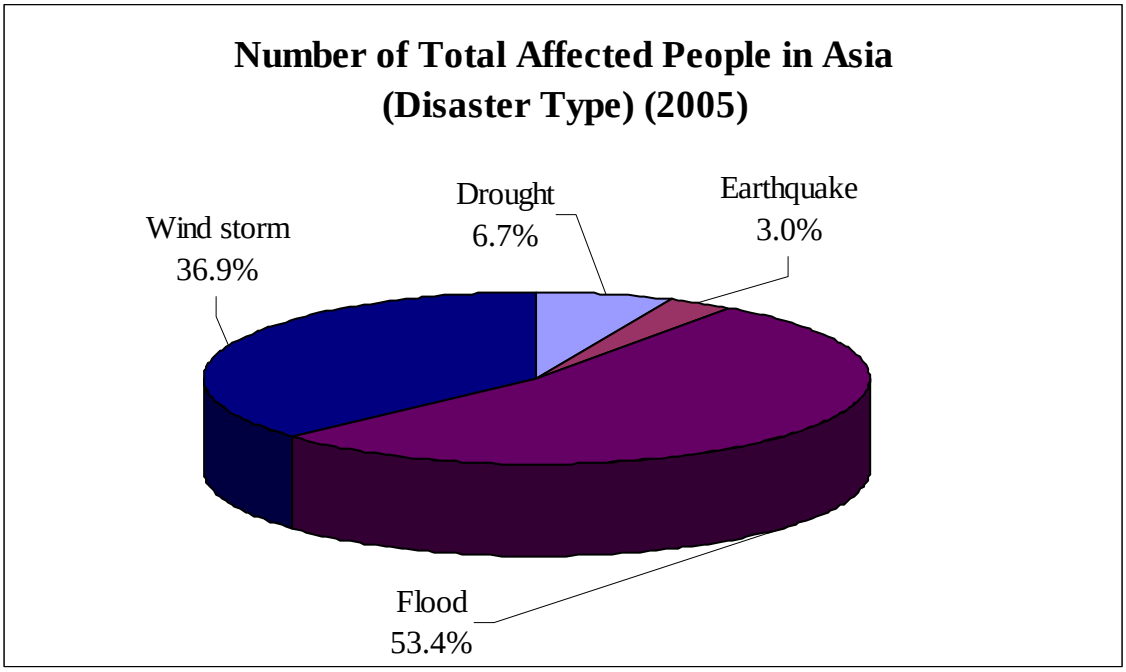
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 10B Proportion of Total Affected People Worldwide by Type of Disaster, 2005



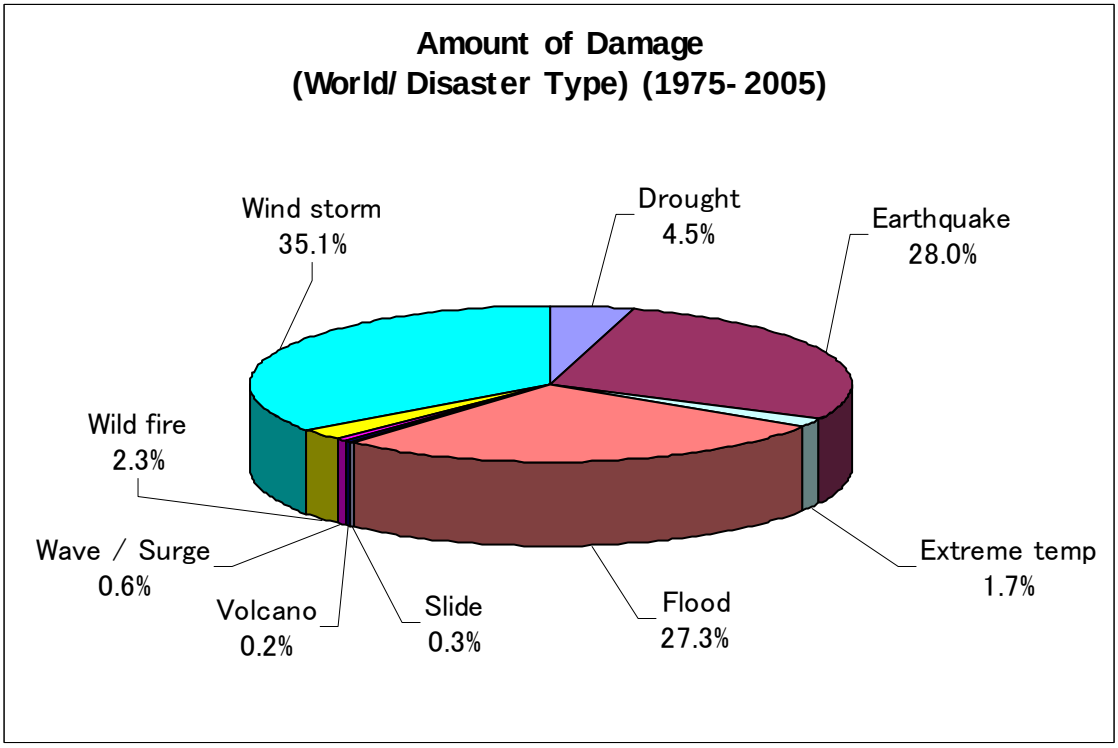
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 10C Proportion of Total Affected People in Asia by Type of Disaster, 2005



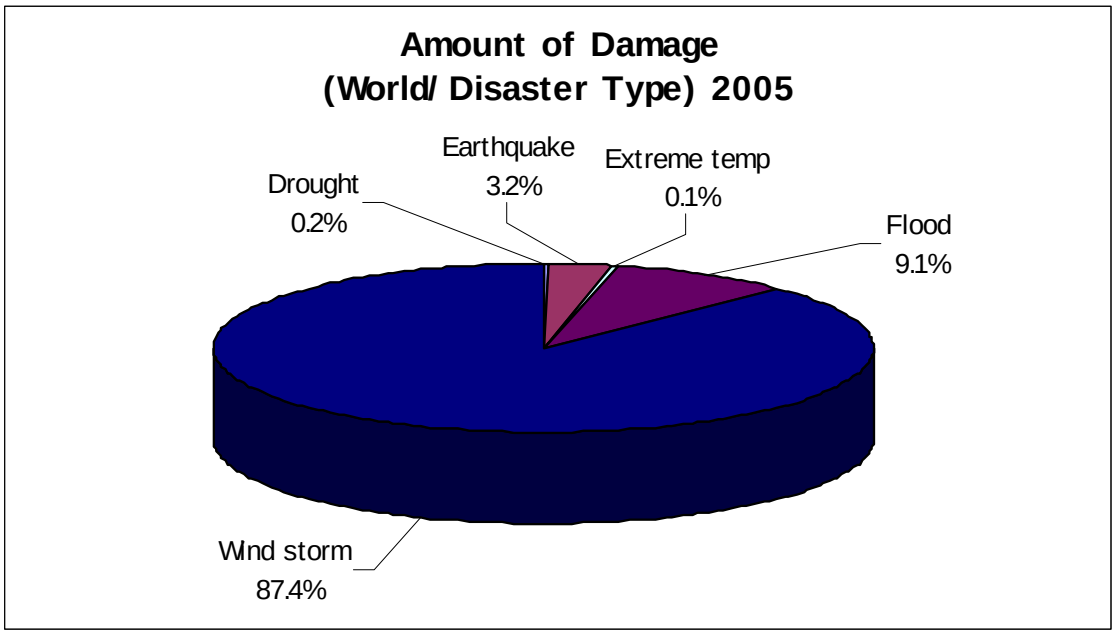
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 11A Proportion of Damage Worldwide by Type of Disaster, 1975-2005



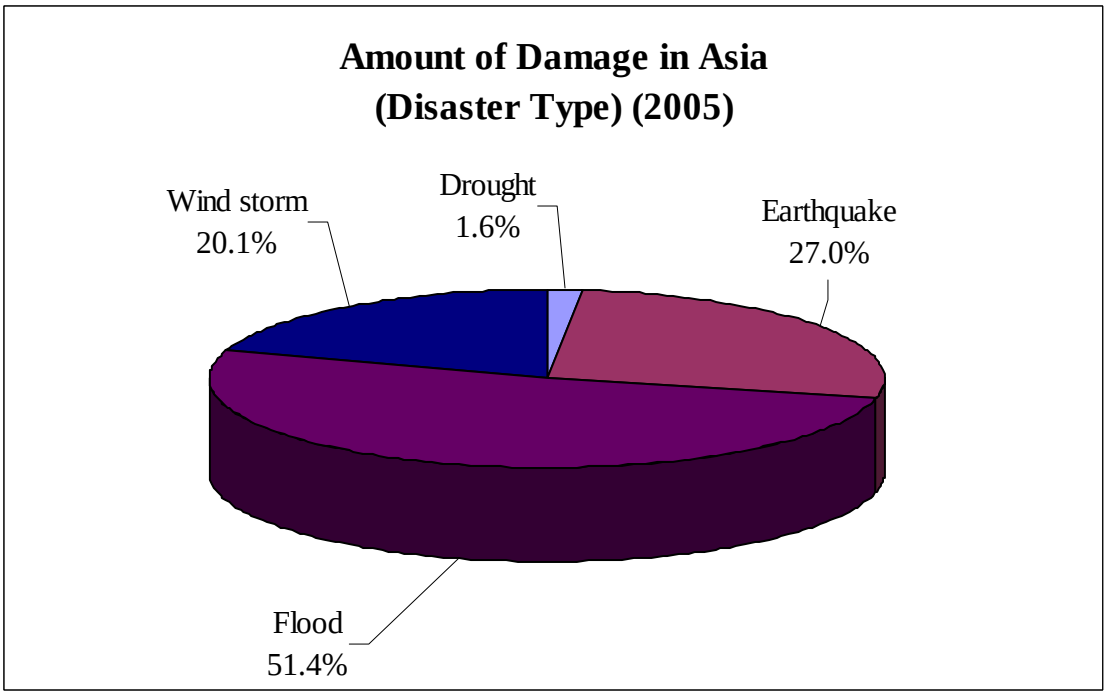
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 11B Proportion of Damage Worldwide by Type of Disaster, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 11C Proportion of Damage in Asia by Type of Disaster, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Based on data related to disaster types and their impact on societies and economies in 2005, we can conclude that the Asian region has been deeply affected by both geo-physical disasters like earthquakes and tsunamis, as well as hydro-meteorological disasters like floods and wind storms. In contrast to the past years, Asia was not much affected by extreme temperatures and droughts in 2004. In 2005, Asia experienced droughts, extreme temperatures and slides, but these were of a smaller magnitude than the other types of disasters that occurred. A comparative analysis can be made from past analytical studies of disasters and the ADRC's "20th Century Asian Natural Disasters Data Book." Socio-economic and cultural dimensions specific to the Asian region provide some explanation of the large number of affected people in spite of a relatively small amount of real economic damage as compared to previous years. But the 2004 Indian Ocean Tsunami and the 2005 South Asian Earthquake disasters changed this perception and prompted the Asian region to adopt appropriate countermeasures. The great amount of human suffering in this region substantially hinders development activities. The above figures clearly illustrate this trend by disaster type for Asia and the rest of the world. The following chapters will also help us better understand regional differences in the characteristics of various types of disasters.

1.3 Vulnerabilities of Countries with Small Economies and Populations

It is obvious that countries with small economies and populations suffer more, even when only minor disasters occur. The following tables show the ranks of actual disasters in terms of the number of people killed, the number of people affected, and the amount of damage, as well as the change in the actual (real) rank when compared to the population and GNI (Gross National Income-Atlas method).[3]

Tables 4 to 9 show that while the actual damage in terms of human and economic losses is small, the effects on the population and the country's economy can be large in comparison with the population and GNI of these countries. Accordingly, this comparison reveals that countries with smaller economies and populations can not bear heavy damage in terms of loss share to population and GNI. For example, Table 4 ranks disaster events according to the number of people killed. Table 5 ranks those events according to the ratio of people killed to the total population. In Table 5, we can see that countries with smaller populations account for a larger share of human losses. While the Canary Islands ranked at 133, Samoa at 209, East Timor at 115, Grenada at 315, and The Gambia at 156 in Table 4 (the actual number of people killed), they all were ranked within the top 25 in Table 5, based on the share of their human loss to their total population. Similar movements can also be observed in other countries, such as El Salvador, Haiti, Somalia, Guinea, Guyana, and Mauritania. Pakistan was ranked 1st and 3rd in its ratio of people killed to the total population and its share of damage to GNI, respectively, due to the disastrous South Asian earthquake disaster. Similar observations can be made from Tables 6, 7, 8, and 9 in terms of affected people and economic damage, underscoring the vulnerability of small states.

[3] Here we used the values from World Bank, 2004 GNI data and definition on atlas method GNI calculation.

Table 4: Top 25 Natural Disasters by Number of People Killed, 2005

Rank (Kill)	Country	Region	DisType	DisSubset	DisName	Month	Day	Killed	Injured	Homeless	Affected	TotAff	DamageUS ('000s)	Location
1	Pakistan	South Asia	Earthquake	Earthquake	Tetanos	10	8	73338	69142	0	2800000	2869142	5000000	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra, Shangla (NWFP)
2	Guatemala	Central America	Wind storm	Hurricane	Cholera	10	1	1513	386	474928	0	475314	988300	Escuintla, Jutiapa, Santa Rosa, Suchitepequez, San Marcos, Quezaltenango, Huehuetenango, Solola,
3	United States	North America	Wind storm	Hurricane		8	29	1322	0	500000	0	500000	125000000	Mobile, Bayou La Batre, Dauphin Island, Coden (Alabama), New Orleans, Slidell, St. Bernard Parish
4	India	South Asia	Earthquake	Earthquake	Meningococcal disease	10	8	1309	6622	0	150000	156622	0	Jammu and Kashmir
5	India	South Asia	Flood	--		7	24	1200	0	20000000	0	20000000	3500000	Gujarat, Madhya Pradesh, Maharashtra, Goa, Orissa, Karnataka, Himachal Pradesh, Jammu and Kasmir
6	Indonesia	South-east Asia	Earthquake	Earthquake	Poliomyelitis	3	28	915	1146	104167	0	105313	0	Simeule, Nias, Banyak Islands, West Coast
7	Ukraine	Russian Federation	Extreme temp	Cold Wave		12	16	801	9600	0	0	9600	0	
8	China, P Rep	East Asia	Flood	--		6	19	771	0	16700000	0	16700000	2000000	Zheijiang, Fujian, Jiangxi, Hunan, Guangdong, Guangxi provinces
9	Iran, Islam Rep	South Asia	Earthquake	Earthquake		2	22	612	1411	93355	0	94766	80000	Rooein Abad, Akbar, Asghar, Dehaafkan, Behabad, Sardkooyeh, Fathabad, Motaharabad, Eslam Abad,
10	Nigeria	West Africa	Epidemic	Measles	Acute Watery Diarrhoeal syndrome	2	28	561	0	23575	0	23575	0	Adamawa, Kano, Jigawa, Bauchi, Yobe, Sokoto, Kaduna, Katsina, Gombe, Taraba states
11	Pakistan	South Asia	Flood	--		2	9	520	450	7000000	0	7000450	0	Pasni Tehsil, Chaman, Pishin, Awaran, Jaffarabas, Naseerabad (Balouchistan province), Ormara, Bela,
12	Guinea Bissau	West Africa	Epidemic	Diarrhoeal/Enteric		6	6	399	0	25111	0	25111	0	Bissau, Biombo, Cacheu, Oio, Bijagos, Bolama, Quinira, Sao Domingos, Tombalia, Gafu and Bafat
13	India	South Asia	Extreme temp	Heat wave		6	0	329	0	0	0	0	0	Uttar Pradesh, Bihar, Bengale occidentale, Orissa, Maharashtra, Andhra Pradesh states
14	Senegal	West Africa	Epidemic	Diarrhoeal/Enteric		1	1	303	0	23022	0	23022	0	Fatick, Dakar, Kolda, Louga, Tambacounda, Touba, Mback・Bambey districts (Diourbel region)
15	India	South Asia	Epidemic	Arbovirus	Leptospirosis	7	29	296	0	939	0	939	0	Uttar Pradesh, Bihar
16	India	South Asia	Epidemic	Arbovirus		7	1	296	0	1145	0	1145	0	Uttar Pradesh and Bihar states
17	Afghanistan	South Asia	Wind storm	Winter		1	0	260	0	22656	0	22656	0	Badakshan, Daikundi, Ghazni, Paktika, Ghor, Zabul, Uruzgan, Wardak
18	India	South Asia	Slide	Avalanche		2	15	250	0	5000	0	5000	0	Verinag , Qazigund, Ramsu, Anantnag, Poonch (Jammu and Cachemire)
19	India	South Asia	Flood	--		6	28	239	0	405000	0	405000	2300000	Surat, Valsad, Navsari, Bharuch, Vadodara, Surendranagar, Dangs, Ahmedabad, Anand, Kheda,
20	Poland	European Union	Extreme temp	Cold Wave		10	0	233	0	0	0	0	0	
21	Korea Dem P Rep	East Asia	Flood	Flash Flood		6	30	193	205	0	16093	16298	0	Dokshon city, Pukchang and Maengsan counties (Pyongan province)
22	Indonesia	South-east Asia	Slide	Landslide		2	21	186	0	0	0	0	0	Bandung
23	India	South Asia	Extreme temp	Cold Wave		12	0	180	0	0	0	0	0	Uttar Pradesh, Punjab, Haryana, Himachal Pradesh, Delhi, Bihar, Radjasthan, Haryana, Jamma and
24	China, P Rep	East Asia	Wind storm	Typhoon	Khanun	9	1	159	0	19624000	0	19624000	1900000	Anhui, Zhejiang, Fujian, Jiangxi, Hubei provinces
25	Ethiopia	East Africa	Flood	Flash Flood		4	23	156	0	235418	0	235418	0	Ogaden region, Gode. West Emi district. Godie, Deghabur, Mustahil. Gode, Jijiga, Kebridehar, Afder,

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 5: Top 25 Natural Disasters by the Ratio of People Killed to the Total Population, 2005

Rank (Kill/Popln)	Rank (Kill)	Country	Region	DisType	DisSubset	DisName	Month	Day	Killed	Injured	Homeless	Affected	TotAff	(2005) (World Fact Book)	Kill/Popln	US$) (World Bank 2004)	DamageUS ('000s)	Location
1	1	Pakistan	South Asia	Earthquake	Earthquake	Tetanos	10	8	73338	69142	0	2800000	2869142	##########	0.000442	90.66	5000000	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra, Shangla (NWFP)
2	12	Guinea Bissau	West Africa	Epidemic	Diarrhoeal/ Enteric		6	6	399	0	25111	0	25111	1442029	0.000277	0.25	0	Bissau, Biombo, Cacheu, Oio, Bijagos, Bolama, Quinira, Sao Domingos, Tombalia, Gafu and Bafat
3	133	Canary Is	North Africa	Wind storm	Tropical storm		11	27	19	0	0	0	0	90234	0.000211	0.73	0	Tenerife, de la Plama Is.
4	2	Guatemala	Central America	Wind storm	Hurricane	Cholera	10	1	1513	386	474928	0	475314	12293545	0.000123	26.95	988300	Escuintla, Jutiapa, Santa Rosa, Suchitepequez, San Marcos, Quezaltenango, Huehuetenango, Solola,
5	209	Samoa	Oceania	Wind storm	Cyclone		2	16	9	0	0	0	0	176908	0.000051	0.34	0	
6	83	Guyana	South America	Flood	--		1	15	34	0	274774	0	274774	767245	0.000044	0.77	465100	Georgetown, Demerara-Mahaica, West Demerara-Essequibo Isl., Mahaica-Berbice
7	14	Senegal	West Africa	Epidemic	Diarrhoeal/ Enteric		1	1	303	0	23022	0	23022	11987121	0.000025	7.19	0	Fatick, Dakar, Kolda, Louga, Tambacounda, Touba, Mback· Bambey districts (Diourbel region)
8	115	East Timor	South-east Asia	Epidemic	Arbovirus		1	5	22	0	336	0	336	1062777	0.000021	0.67	0	Dili, Liquica, Maliana, Baucau, Manatuto
9	56	Mauritania	West Africa	Epidemic	Diarrhoeal/ Enteric		7	20	55	0	2585	0	2585	3177388	0.000017	1.57	0	Nouakchott, Brakna, Guidimakha, Traza, Elmina, Arafat, Dar Naim, Ksar, Sebkha districts
10	7	Ukraine	Russian Federation	Extreme temp	Cold Wave		12	16	801	9600	0	0	9600	46710816	0.000017	60.20	0	
11	28	Burundi	East Africa	Drought	Drought		1	0	120	0	2150000	0	2150000	8090068	0.000015	0.67	0	Busoni, Bugabira, Ntega, Kirundo communes (Kirundo province), Muyinga province
12	30	Chad	Central Africa	Epidemic	Measles		1	3	115	0	6000	0	6000	9944201	0.000012	2.33	0	Batha, Ndjamena, Chari-Baguirmi, Moyen-Chari, Tandjile, Ouaddai, Wadi Fara
13	315	Grenada	Caribbean	Wind storm	Hurricane		7	17	1	0	0	835	835	89703	0.000011	0.40	0	Carriacou Isl., Petit Martinique
14	46	El Salvador	Central America	Wind storm	Hurricane	Adrian	10	1	69	0	72141	0	72141	6822378	0.000010	15.70	355700	San Salvador, Lourdes, Chaparral, Ateos, San Marcos, Santa Tecla, El Chaparral, La Libertad
15	93	Liberia	West Africa	Epidemic	Diarrhoeal/ Enteric		8	2	29	0	674	0	674	3042004	0.000010	0.37	0	Sinoe County
16	156	Gambia, The	West Africa	Flood	Flash Flood		4	26	15	0	0	0	0	1641564	0.000009	0.41	0	Lawe Mengkudu, Badar
17	9	Iran, Islam Rep	South Asia	Earthquake	Earthquake		2	22	612	1411	93355	0	94766	68688433	0.000009	155.33	80000	Rooein Abad, Akbar, Asghar, Dehaafkan, Behabad, Sardkooyeh, Fathabad, Motaharabad. Eslam Abad.
18	17	Afghanistan	South Asia	Wind storm	Winter		1	0	260	0	22656	0	22656	31056997	0.000008	5.54	0	Badakshan, Daikundi, Ghazni, Paktika, Ghor, Zabul, Uruzgan, Wardak
19	21	Korea Dem P Rep	East Asia	Flood	Flash Flood		6	30	193	205	0	16093	16298	23113019	0.000008	2.13	0	Dokshon city, Pukchang and Maengsan counties (Pyongan province)
20	44	Guinea	West Africa	Epidemic	Diarrhoeal/ Enteric	Cholera	4	11	72	0	1884	0	1884	9690222	0.000007	3.81	0	Conakry, Boke, Boffa, Coyah, Forecariah, Kindia, Pita prefectures
21	64	Honduras	Central America	Wind storm	Tropical storm		11	18	47	0	90000	0	90000	7326496	0.000006	7.32	0	Atlantida, Colon, Cortes, Gracias a Dios, Yoro departments
22	20	Poland	European Union	Extreme temp	Cold Wave		10	0	233	0	0	0	0	38536869	0.000006	232.93	0	
23	87	El Salvador	Central America	Flood	--		6	24	33	0	2332	0	2332	6822378	0.000005	15.70	0	San Pedro Puxtla, San Salvador area. Apaneca, Comasagua. Cusinahuat
24	73	Haiti	Caribbean	Wind storm	Hurricane	Emily	7	7	40	0	15000	0	15000	8308504	0.000005	3.73	0	Southern, Western, Nippes, South East, Grande Anse departments
25	74	Somalia	East Africa	Flood	Flash Flood		4	23	40	0	5000	0	5000	8863338	0.000005	4.67	0	Hargeisa, Jowhar, Burco, Berbera, Burao, Borame and Sayla. Hiiran region - Beletweyne. Lower Jubba -

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 6: Top 25 Natural Disasters by the Number of Total Affected People, 2005

Rank (TotAff)	Country	Region	DisType	DisSubset	DisName	Month	Day	Killed	Injured	Homeless	Affected	TotAff	DamageUS ('000s)	Location
1	India	South Asia	Flood	--		7	24	1200	0	20000000	0	20000000	3500000	Gujarat, Madhya Pradesh, Maharashtra, Goa, Orissa, Karnataka, Himachal Pradesh,
2	China, P Rep	East Asia	Wind storm	Typhoon	Khanun	9	1	159	0	19624000	0	19624000	1900000	Anhui, Zhejiang, Fujian, Jiangxi, Hubei provinces
3	China, P Rep	East Asia	Flood	--		6	19	771	0	16700000	0	16700000	2000000	Zheijiang, Fujian, Jiangxi, Hunan, Guangdong, Guangxi provinces
4	China, P Rep	East Asia	Flood	--		6	28	58	230	11230000	0	11230230	2700	Dazhou, Bazhong, Guangan, Nanchong, Yibin, Luzhou, Ganzi (Sichuan province)
5	China, P Rep	East Asia	Wind storm	Typhoon	Talim	8	6	19	0	9160000	0	9160000	850000	Shanghai, Jiangsu, Shandong, Angui, Zheijiang provinces
6	China, P Rep	East Asia	Wind storm	Winter		3	3	36	0	8000000	0	8000000	300000	Yunnan
7	China, P Rep	East Asia	Drought	--		7	7	0	0	7600000	0	7600000	0	Shanxi, Inner MOngolia, Ningxia Autonomous rehion, Hupan, Guizhou
8	Pakistan	South Asia	Flood	--		2	9	520	450	7000000	0	7000450	0	Pasni Tehsil, Chaman, Pishin, Awaran, Jaffarabas, Naseerabad (Balouchistan province),
9	China, P Rep	East Asia	Wind storm	Tropical storm	Longwang	9	26	25	0	5719000	0	5719000	0	Hainan Isl., Guangdong, Guangxi provinces
10	China, P Rep	East Asia	Flood	--		9	29	20	0	4610000	0	4610000	239000	Shiyan (Hubei Province), Xixinag county, Hanzhong city and 11 surrounding
11	Malawi	East Africa	Drought	Drought		10	0	0	0	4500000	0	4500000	0	Southern and central regions
12	Niger	West Africa	Drought	Drought	Cholera	7	0	0	0	3600000	0	3600000	0	
13	Pakistan	South Asia	Earthquake	Earthquake	Tetanos	10	8	73338	69142	0	2800000	2869142	5000000	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra,
14	Cuba	Caribbean	Wind storm	Hurricane	Wilma	7	8	16	0	2500000	0	2500000	1400000	Cienfuegos, La Habana, Ciudad de la Habana, Matanzas, Sancti Spiritus, Ciego de Avila,
15	Kenya	East Africa	Drought	Drought		12	0	27	0	2500000	0	2500000	0	Makueni, Kitui, Malindi, Kwale, Kilifi, Taita Taveta, Mandera, Wajir, Marsabit,
16	China, P Rep	East Asia	Wind storm	Typhoon		10	2	95	0	2460000	0	2460000	148000	Fujian, Guangdong provinces
17	Burundi	East Africa	Drought	Drought		1	0	120	0	2150000	0	2150000	0	Busoni, Bugabira, Ntega, Kirundo communes (Kirundo province), Muyinga
18	India	South Asia	Flood	--		10	21	14	0	2000000	0	2000000	0	East Midnapore, South 24 Parganas, Burdwan and Nadia (West Bengal state), Balasore district
19	Mexico	Central America	Wind storm	Hurricane	Wilma	10	1	15	0	1954571	0	1954571	0	Chiapas, Oaxaca, Veracruz, Puebla, Hidalgo, Tabasco
20	India	South Asia	Flood	--		7	7	70	0	1904000	4000	1908000	0	Majuli, Didrugarh, Jorhat, Sonitpur, Sivasagar. Districts: Dhemaji, Tinsukia,
21	Mozambique	East Africa	Drought	Drought		5	0	0	0	1400000	0	1400000	0	Maputo, Gaza, Inhambane, Manica, Sofala, Zambezia, Tete regions
22	China, P Rep	East Asia	Wind storm	Typhoon	Damrey	9	11	16	0	1350000	0	1350000	0	Shanghai area, Zheijiang province, Jiangsu provinces
23	China, P Rep	East Asia	Flood	--		7	1	5	0	1270000	0	1270000	271000	Jilin, Heilongjang provinces
24	Zambia	East Africa	Drought	--	Cholera	6	0	0	0	1200000	0	1200000	0	
25	Bangladesh	South Asia	Flood	--		7	7	23	0	1000000	0	1000000	0	Kurigram, Gaibandha, Lalmonirhat, Rangpur, Nilphamari, Sherpur. Siraigangi, Siraigani,

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 7: Top 25 Natural Disasters by the Ratio of Total Affected People to the Total Population, 2005

Rank (TotAff/Popln)	Rank (TotAff)	Country	Region	DisType	DisSubset	DisName	Month	Day	Killed	Injured	Homeless	Affected	TotAff	(2005) (World Fact Book)	TotAff/Poln	US$) (World Bank 2004)	DamageUS ('000s)	Location
1	45	Guyana	South America	Flood	–		1	15	34	0	274774	0	274774	767245	0.35813	0.77	465100	Georgetown, Demerara-Mahaica, West Demerara-Essequibo Isl., Mahaica-Berbice
2	47	Comoros	East Africa	Volcano	Explosive Eruption		11	24	1	0	245000	0	245000	690948	0.35459	0.33	0	Grande-Comores Isl.
3	11	Malawi	East Africa	Drought	Drought		10	0	0	0	4500000	0	4500000	13013926	0.34578	2.04	0	Southern and central regions
4	55	Djibouti	East Africa	Drought	Drought		4	0	0	0	150000	0	150000	486530	0.30831	0.74	0	
5	12	Niger	West Africa	Drought	Drought	Cholera	7	0	0	0	3600000	0	3600000	12525094	0.28742	2.84	0	
6	17	Burundi	East Africa	Drought	Drought		1	0	120	0	2150000	0	2150000	8090068	0.26576	0.67	0	Busoni, Bugabira, Ntega, Kirundo communes (Kirundo province), Muyinga province
7	14	Cuba	Caribbean	Wind storm	Hurricane	Wilma	7	8	16	0	2500000	0	2500000	11382820	0.21963	32.83	1400000	Cienfuegos, La Habana, Ciudad de la Habana, Matanzas, Sancti Spiritus, Ciego de Avila
8	40	Albania	Rest of Europe	Wind storm	Winter		1	23	2	0	400000	0	400000	3581655	0.11168	6.59	0	Kukes, Dibra, Shkodra, Lezha, Korca, Elbasan, Berat, Gjirokastra, Vlora prefectures
9	24	Zambia	East Africa	Drought	–	Cholera	6	0	0	0	1200000	0	1200000	11502010	0.10433	4.63	0	
10	27	Mali	West Africa	Drought	Drought	Cholera	3	4	0	0	1000000	0	1000000	11716829	0.08535	4.33	0	Mopti, Tombouctou, Gao
11	15	Kenya	East Africa	Drought	Drought		12	0	27	0	2500000	0	2500000	34707817	0.07203	16.06	0	Makueni, Kitui, Malindi, Kwale, Kilifi, Taita Taveta, Mandera, Wajir, Marsabit, Kaiiado
12	21	Mozambique	East Africa	Drought	Drought		5	0	0	0	1400000	0	1400000	19686505	0.07111	5.28	0	Maputo, Gaza, Inhambane, Manica, Sofala, Zambezia, Tete regions
13	77	Comoros	East Africa	Volcano	Explosive Eruption	Karthala	4	16	0	0	39000	0	39000	690948	0.05644	0.33	0	Dimani, Pidjani regions (Grande Comore)
14	32	Cambodia	South-east Asia	Drought	Drought		4	0	0	0	600000	0	600000	13881427	0.04322	4.81	0	Kompong Speu province
15	8	Pakistan	South Asia	Flood	–		2	9	520	450	7000000	0	7000450	##########	0.04222	90.66	0	Pasni Tehsil, Chaman, Pishin, Awaran, Jaffarabas, Naseerabad (Balouchistan province)
16	35	Guatemala	Central America	Wind storm	Hurricane	Cholera	10	1	1513	386	474928	0	475314	12293545	0.03866	26.95	988300	Escuintla, Jutiapa, Santa Rosa, Suchitepequez, San Marcos, Quezaltenango, Huehuetenango, Solola.
17	249	Cook Is	Oceania	Wind storm	Cyclone		2	28	0	8	600	0	608	21388	0.02843	0.34	0	Pukapuka, Nassau Islands
18	152	Vanuatu	Oceania	Volcano	Explosive Eruption		11	27	0	0	5000	0	5000	208869	0.02394	0.29	0	Ambae Isl.
19	33	Uganda	East Africa	Drought	Drought	Cholera	3	0	0	0	600000	0	600000	28195754	0.02128	6.89	0	Kalapata, Nyakwae (Kotido district), Rupa, Nadunget (Moroto district), Karamoja region
20	330	Tokelau	Oceania	Wind storm	Cyclone	Emily	2	28	0	1	0	25	26	1392	0.01868	0.10	0	Nukunonu, Atafu, Fakaofo
21	1	India	South Asia	Flood	–		7	24	1200	0	20000000	0	20000000	##########	0.01826	673.21	3500000	Gujarat, Madhya Pradesh, Maharashtra, Goa, Orissa, Karnataka, Himachal Pradesh, Jammu and
22	19	Mexico	Central America	Wind storm	Hurricane	Wilma	10	1	15	0	1954571	0	1954571	##########	0.01819	704.91	0	Chiapas, Oaxaca, Veracruz, Puebla, Hidalgo, Tabasco
23	89	Guinea Bissau	West Africa	Epidemic	Diarrhoeal/ Enteric		6	6	399	0	25111	0	25111	1442029	0.01741	0.25	0	Bissau, Biombo, Cacheu, Oio, Bijagos, Bolama, Quinira, Sao Domingos, Tombalia, Gafu and Bafat
24	13	Pakistan	South Asia	Earthquake	Earthquake	Tetanos	10	8	73338	69142	0	2800000	2869142	##########	0.01730	90.66	5000000	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra,
25	2	China, P Rep	East Asia	Wind storm	Typhoon	Khanun	9	1	159	0	19624000	0	19624000	##########	0.01486	1937.97	1900000	Anhui, Zhejiang, Fujian, Jiangxi, Hubei provinces

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 8: Top 25 Natural Disasters by the Amount of Damage, 2005

Rank (Amt Dam)	Country	Region	DisType	DisSubset	DisName	Month	Day	Killed	Injured	Homeless	Affected	TotAff	DamageUS ('000s)	Location
1	United States	North America	Wind storm	Hurricane		8	29	1322	0	500000	0	500000	125000000	Mobile, Bayou La Batre, Dauphin Island, Coden (Alabama), New Orleans, Slidell, St. Bernard Parish
2	United States	North America	Wind storm	Hurricane	Wilma	9	23	0	0	300000	0	300000	6000000	Louisiana, Texas, Mississipi
3	Pakistan	South Asia	Earthquake	Earthquake	Tetanos	10	8	73338	69142	0	2800000	2869142	5000000	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra,
4	India	South Asia	Flood	--		7	24	1200	0	20000000	0	20000000	3500000	Gujarat, Madhya Pradesh, Maharashtra, Goa, Orissa, Karnataka, Himachal Pradesh, Jammu and
5	India	South Asia	Flood	--		6	28	239	0	405000	0	405000	2300000	Surat, Valsad, Navsari, Bharuch, Vadodara, Surendranagar, Dangs, Ahmedabad, Anand,
6	China, P Rep	East Asia	Flood	--		6	19	771	0	16700000	0	16700000	2000000	Zheijiang, Fujian, Jiangxi, Hunan, Guangdong, Guangxi provinces
7	China, P Rep	East Asia	Wind storm	Typhoon	Khanun	9	1	159	0	19624000	0	19624000	1900000	Anhui, Zhejiang, Fujian, Jiangxi, Hubei provinces
8	Cuba	Caribbean	Wind storm	Hurricane	Wilma	7	8	16	0	2500000	0	2500000	1400000	Cienfuegos, La Habana, Ciudad de la Habana, Matanzas, Sancti Spiritus, Ciego de Avila,
9	Switzerland	Rest of Europe	Flood	--		8	21	6	0	2500	0	2500	1096954	Bern, Brienz, Lucerne, Schwyz, Uri, Obwalden
10	Guatemala	Central America	Wind storm	Hurricane	Cholera	10	1	1513	386	474928	0	475314	988300	Escuintla, Jutiapa, Santa Rosa, Suchitepequez, San Marcos, Quezaltenango, Huehuetenango, Solola,
11	China, P Rep	East Asia	Flood	--		8	13	48	0	0	206000	206000	913000	Liaoning, Jilin provinces
12	China, P Rep	East Asia	Wind storm	Typhoon	Talim	8	6	19	0	9160000	0	9160000	850000	Shanghai, Jiangsu, Shandong, Angui, Zheijiang provinces
13	Romania	Rest of Europe	Flood	--		7	12	24	0	14669	0	14669	824887	Alba, Tulcea, Giurgiu, Vrancea, Bacau, Braila, Galati, Vrancea, Ialomita, departments
14	Romania	Rest of Europe	Flood	--		4	21	2	0	3400	0	3400	596000	Arad, Mehedinti, Timis, Caras-Severin, Secanj, Zitiste, Bela Crkva, Plandiste
15	United Kingdom	European Union	Wind storm	Storm		1	7	5	0	6000	0	6000	500000	Scotland, North England, Pays de Galles, West Yorkshire
16	Guyana	South America	Flood	--		1	15	34	0	274774	0	274774	465100	Georgetown, Demerara-Mahaica, West Demerara-Essequibo Isl., Mahaica-Berbice
17	Canada	North America	Flood	--		6	7	4	0	5000	0	5000	400000	Central and southern Alberta, Saskatchewan
18	El Salvador	Central America	Wind storm	Hurricane	Adrian	10	1	69	0	72141	0	72141	355700	San Salvador, Lourdes, Chaparral, Ateos, San Marcos, Santa Tecla, El Chaparral, La Libertad
19	United States	North America	Wind storm	Storm	Dennis	4	6	0	8	45	51	104	350000	Rankin county (Mississippi)
20	United States	North America	Wind storm	Winter		1	22	20	0	0	0	0	350000	New York, Connecticut, Wisconsin, Ohio, Maryland, Massachusetts, Iowa
21	Romania	Rest of Europe	Flood	--		8	14	33	0	2000	0	2000	313000	Harghita, Mures, Dolj, Bacau, Vrancea, Galati, Braila, Bistrita, Gorj, Suceava
22	China, P Rep	East Asia	Wind storm	Winter		3	3	36	0	8000000	0	8000000	300000	Yunnan
23	China, P Rep	East Asia	Flood	--		7	1	5	0	1270000	0	1270000	271000	Jilin, Heilongjang provinces
24	China, P Rep	East Asia	Wind storm	Typhoon		7	16	9	0	0	13000	13000	260000	Wenzhou, Pingyang (Zheijiang province)
25	Thailand	South-east Asia	Drought	Drought		3	20	9	0	0	0	0	250000	

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 9: Top 25 Natural Disasters by the Ratio of Damage to GNI, 2005

Rank (Dam/GNI)	Rank (Amt Dam)	Country	Region	DisType	DisSubset	DisName	Month	Day	Killed	Injured	Homeless	Affected	TotAff	Population (2005) (World Fact Book)	US$) (World Bank 2004)	DamageUS ('000s)	Dam/GNI	Location
1	16	Guyana	South America	Flood	--		1	15	34	0	274774	0	274774	767245	0.77	465100	0.604026	Georgetown, Demerara-Mahaica, West Demerara-Essequibo Isl., Mahaica-Berbice
2	3	Pakistan	South Asia	Earthquake	Earthquake	Tetanos	10	8	73338	69142	0	2800000	2869142	165803560	90.66	5000000	0.055151	Bagh, Muzzafarabad, Poonch (Kashmir), Abottabad, Battagram, Kohistan, Mansehra, Shangla (NWFP)
3	8	Cuba	Caribbean	Wind storm	Hurricane	Wilma	7	8	16	0	2500000	0	2500000	11382820	32.83	1400000	0.042644	Cienfuegos, La Habana, Ciudad de la Habana, Matanzas, Sancti Spiritus, Ciego de Avila, Camaguey,
4	10	Guatemala	Central America	Wind storm	Hurricane	Cholera	10	1	1513	386	474928	0	475314	12293545	26.95	988300	0.036672	Escuintla, Jutiapa, Santa Rosa, Suchitepequez, San Marcos, Quezaltenango, Huehuetenango, Solola,
5	41	Tajikistan	Russian Federation	Flood	--		7	23	0	0	1890	0	1890	7320815	1.78	50000	0.028090	Mir Said Alii Hamadoni district (Khatlon Oblast, Akhvand, Vamar, Dasht (Rushan district, Gorno-
6	18	El Salvador	Central America	Wind storm	Hurricane	Adrian	10	1	69	0	72141	0	72141	6822378	15.70	355700	0.022656	San Salvador, Lourdes, Chaparral, Ateos, San Marcos, Santa Tecla, El Chaparral, La Libertad
7	13	Romania	Rest of Europe	Flood	--		7	12	24	0	14669	0	14669	22303552	64.16	824887	0.012857	Alba, Tulcea, Giurgiu, Vrancea, Bacau, Braila, Galati, Vrancea, Ialomita, departments
8	26	Bulgaria	Rest of Europe	Flood	--		7	2	17	0	200	0	200	7385367	21.34	247000	0.011575	Shoumen, Stara Zagora, Targovitch• Popovo, Rouss• Veliko Tarnovo, Haskovo, Bourgas, Vratza, Silistra,
9	1	United States	North America	Wind storm	Hurricane		8	29	1322	0	500000	0	500000	298444215	12168.48	125000000	0.010272	Mobile, Bayou La Batre, Dauphin Island, Coden (Alabama), New Orleans, Slidell, St. Bernard Parish
10	14	Romania	Rest of Europe	Flood	--		4	21	2	0	3400	0	3400	22303552	64.16	596000	0.009289	Arad, Mehedinti, Timis, Caras-Severin, Secanj, Zitiste, Bela Crkva, Plandiste
11	4	India	South Asia	Flood	--		7	24	1200	0	20000000	0	20000000	1095351995	673.21	3500000	0.005199	Gujarat, Madhya Pradesh, Maharashtra, Goa, Orissa, Karnataka, Himachal Pradesh, Jammu and Kasmir
12	29	Viet Nam	South-east Asia	Wind storm	Tropical storm	Kai Tak	9	27	75	28	337632	0	337660	84402966	44.63	219250	0.004913	Yen Bai (Cat Thinh in Van Chan district, Tram Tau, Nghia Lo), Nghe An, Phu ho, Hoa Binh, Lao Cai, Thanh
13	21	Romania	Rest of Europe	Flood	--		8	14	33	0	2000	0	2000	22303552	64.16	313000	0.004878	Harghita, Mures, Dolj, Bacau, Vrancea, Galati, Braila, Bistrita, Gorj, Suceava
14	5	India	South Asia	Flood	--		6	28	239	0	405000	0	405000	1095351995	673.21	2300000	0.003416	Surat, Valsad, Navsari, Bharuch, Vadodara, Surendranagar, Dangs, Ahmedabad, Anand, Kheda,
15	9	Switzerland	Rest of Europe	Flood	--		8	21	6	0	2500	0	2500	7523934	366.50	1096954	0.002993	Bern, Brienz, Lucerne, Schwyz, Uri, Obwalden
16	59	Moldova, Rep	Russian Federation	Flood	--		8	18	0	0	6500	0	6500	4466706	2.61	7752	0.002970	Edinet, Criuleni, Briceni, Nisporeni, Riscani, Chisinau, Balti districts
17	25	Thailand	South-east Asia	Drought	Drought		3	0	0	0	0	0	0	64631595	158.37	250000	0.001579	
18	67	Kyrgyzstan	Russian Federation	Flood	--		6	10	3	0	0	2050	2050	5213898	2.06	2660	0.001291	Nookat, Uzgen, Karasuu, Karakuldja, Alay district (Osj province), Kyzyl, Kia, Kadamjai, Batken, Laylak
19	36	New Zealand	Oceania	Flood	--		5	18	0	0	0	400	400	4076140	81.16	100000	0.001232	North Island - Bay of Plenty province - Tauranga, Otumoetai. Whakatane District - Matata
20	51	Costa Rica	Central America	Flood	--		1	11	4	0	2143	0	2143	4075261	19.00	20000	0.001053	Guacimo, Limon, Matina, Pococi, Siquierres, Talamanca (Limon province), Sarapiqui (Heredia province),
21	6	China, P Rep	East Asia	Flood	--		6	19	771	0	16700000	0	16700000	1320914145	1937.97	2000000	0.001032	Zheijiang, Fujian, Jiangxi, Hunan, Guangdong, Guangxi provinces
22	7	China, P Rep	East Asia	Wind storm	Typhoon	Khanun	9	1	159	0	19624000	0	19624000	1320914145	1937.97	1900000	0.000980	Anhui, Zhejiang, Fujian, Jiangxi, Hubei provinces
23	42	Viet Nam	South-east Asia	Drought	Drought		5	0	0	0	410000	0	410000	84402966	44.63	42120	0.000944	Ben Tre province
24	37	Iran, Islam Rep	South Asia	Earthquake	Earthquake		2	22	612	1411	93355	0	94766	68688433	155.33	80000	0.000515	Rooein Abad, Akbar, Asghar, Dehaafkan, Behabad, Sardkooyeh, Fathabad, Motaharabad, Eslam Abad,
25	40	Venezuela	South America	Flood	--		2	7	76	0	25000	0	25000	25730435	105.33	52000	0.000494	Vargas, Carabobo, Puerto Cabello, Caracas , Yaracuy, Falcon, Aragua, Caputal district, Tachira, Zulia,

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

The above tables and figures clearly show the trends in natural disasters in Asia and around the world, as well as the impacts and characteristics of those disasters in 2005. This chapter also analyzed the vulnerability of the small states due to the small size of their populations and economies. It is equally important to analyze the impact of disasters on economic development and efforts to achieve sustainable development in order to stimulate the development of effective disaster risk management approaches. The following chapters will illustrate these issues in detail.

Chapter 2: Natural Disasters and Sustainable Development

This chapter addresses the importance of the link between disaster reduction frameworks and development initiatives, based on the disaster trends in 2005. As we know, various UN agencies, international institutions, and governments have placed high priority on natural disasters and sustainable development. Hence, it is of paramount importance that efforts be made to analyze disaster trends in relation to variables of sustainable development, primarily the Human Development Index and other economic factors, especially in countries that are affected by disasters. These trends are discussed below.

2.1 Human Development and Natural Disasters

The human development level (HDL) is a measure of factors that express a country's level of development, including its literacy rate, gross school enrollment rate, per capita income, and life expectancy. These variables are significant in terms of disaster mitigation, preparedness planning, and disaster reduction and management strategies. Higher HDLs will make planning and management strategies and follow-up activities easier in post-disaster periods. A country's HDL is categorized as high (HHD: 0.8 or higher), medium (MHD: .5 to 0.79) or low (LHD: lower than 0.5), in accordance with UNDP specifications. This section presents disaster data according to the HDL.

Income levels are also categorized as high (annual per capita income US$9,266 and above), upper middle (annual per capita income $2,996-$9,265), lower middle (annual per capita income $756-$2,995) and low (annual per capita income less than $755) according to the World Bank definitions. The figures below show the disaster characteristics by income level, both globally and regionally.

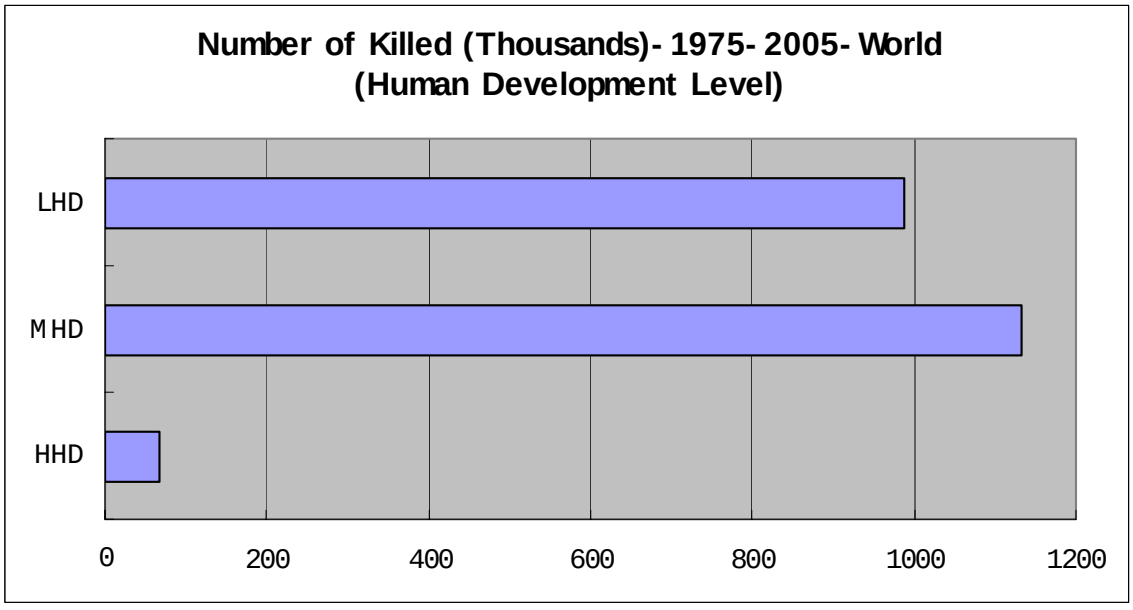
Figures 12, 13A, 13B, 14, 15A, 15B, 16, 17A, and 17B show the relationship between the HDL and the impacts that disaster-related human suffering and economic losses have on societies and economies. Figures 12, 14, and 16 show the number of people killed, the number of total affected people, and the amount of damage, respectively, by HDL for the period 1975 to 2005. Figures marked as A and B show the ratio of people killed to population, total affected people per million population, and the ratio of damage to GNI for the world (A) and for Asia (B). Disaster trends for 2005 clearly show that human loss and suffering were considerably higher in countries with low human development (LHD), as the ratios of people killed and people affected to the total population were considerably higher in LHD countries than in medium human development (MHD) or high human development (HHD) countries.

In 2003, however, a major shift occurred around the world. An unexpected heat wave caused tremendous human suffering in the HHD countries of Europe in 2003. The 2004 disaster trends once

again stressed the importance of disaster reduction in the developing countries. The trends in 2005 further indicate that countries with low and medium human development levels tend to suffer more serious human and economic losses. The figures for the year 2005, as shown below, clearly illustrate this important point. Since the human development index reflects a country's literacy rate, life expectancy, and per capita income, improving these variables could contribute immensely to reducing the impact of natural disasters. Although considerable disaster damage was sustained in the HHD countries, the impact of disasters, in terms of human and economic losses, were more severe in the MHD and LHD countries. Since developing and least developed countries (LDCs) tend to have low and medium HDLs, and thus tend to have elevated levels of human and economic losses, their development efforts and ability to compete within a scenario of global development are limited. Better disaster management approaches are therefore needed in these regions.

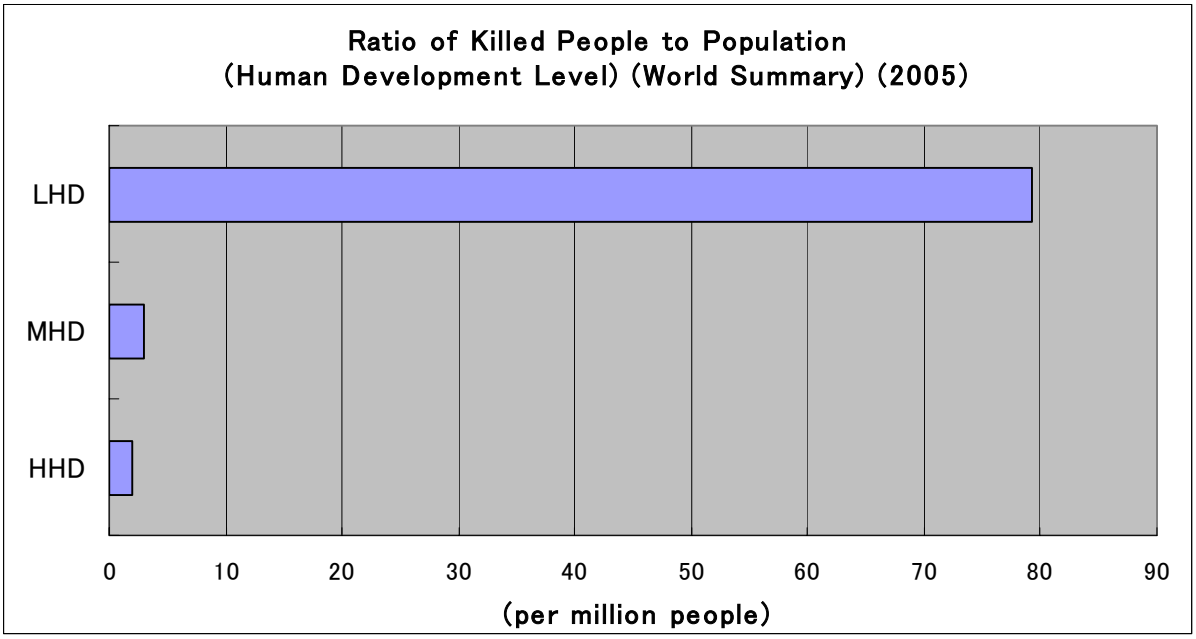
It is also quite evident from the following figures that the ratios of people killed and total affected people to the total population are high in the LHD and MHD countries, stressing the importance of incorporating disaster reduction approaches into mainstream national policies. Although the real value of damage is high in higher income countries, the ratio of damage to GNI is higher in the low and middle income countries. Likewise, although the actual human losses are higher in the MHD countries, the LHD countries are shown to suffer more when the human loss and suffering are expressed as the ratio to the total population.

Figure 12 Number of People Killed (Thousands) by Human Development Level, 1975-2005 (World)



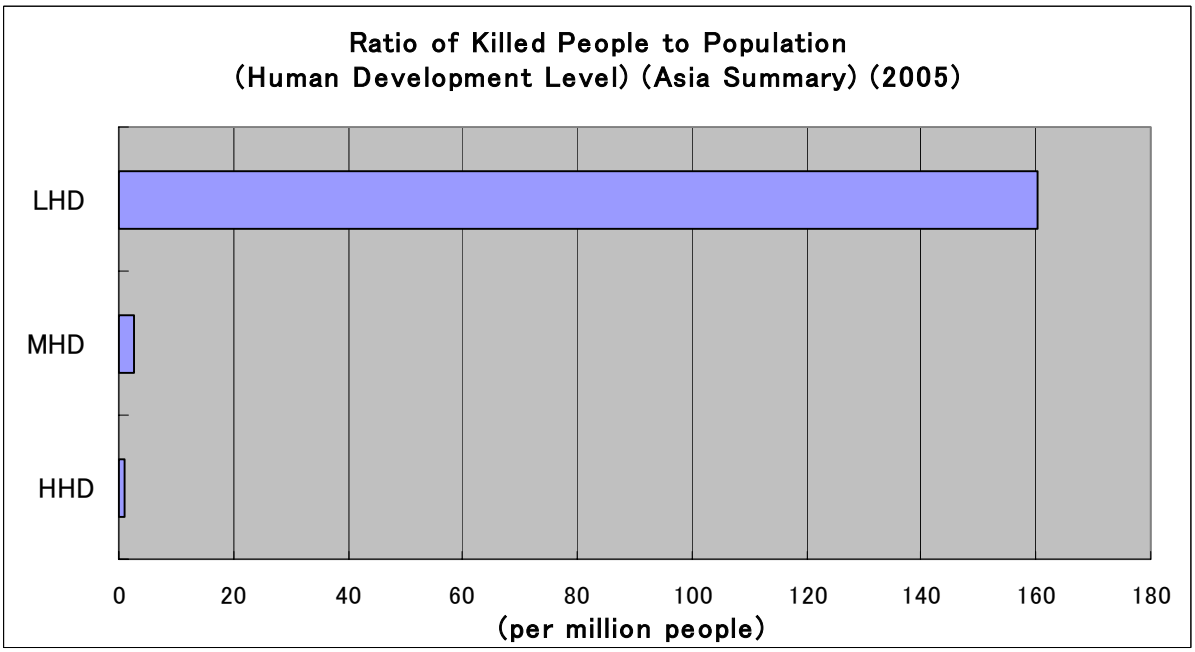
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 13A Ratio of People Killed to Population by Human Development Level, 2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

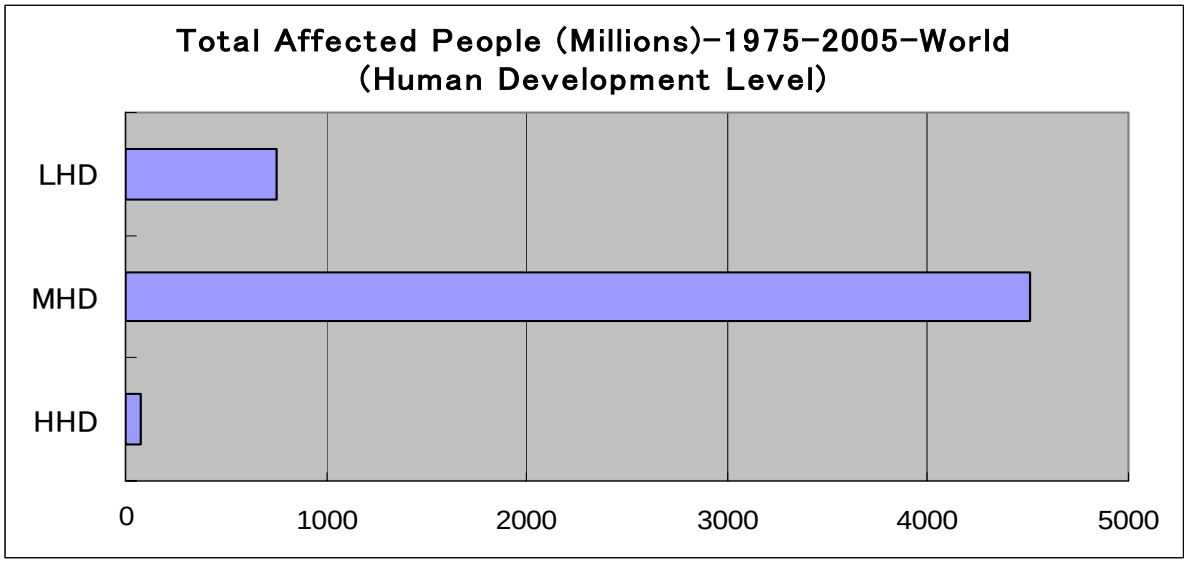
Figure 13B Ratio of People Killed to Population by Human Development Level, 2005 (Asia)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

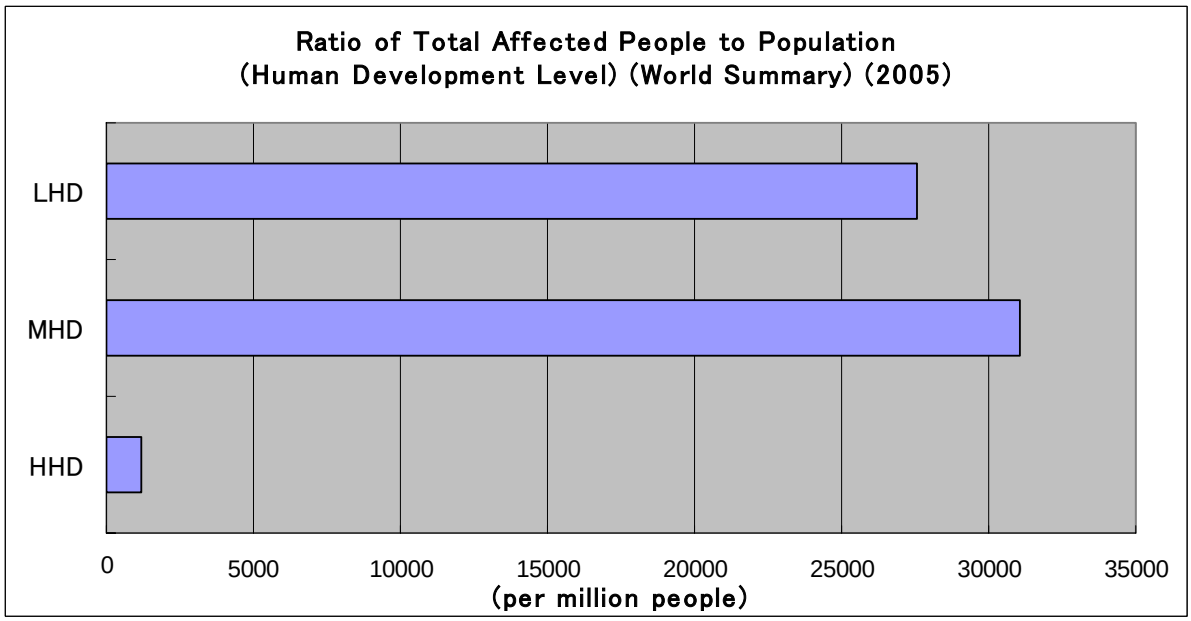
These figures clearly show that the majority of human losses were reported in countries with a low level of human development (due to the South Asian Earthquake). This is consistent for figures both in Asia and worldwide.

Figure 14 Total Affected People (Millions) by Human Development Level, 1975-2005 (World)



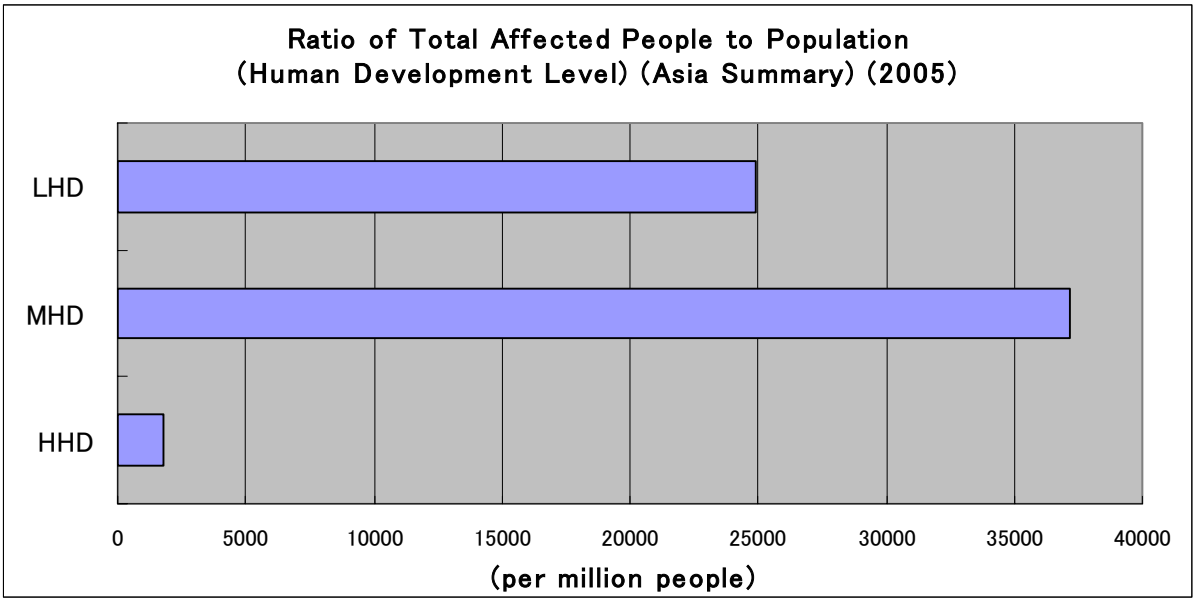
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 15A Total Affected People Per Million Population by Human Development Level, 2005 (World)



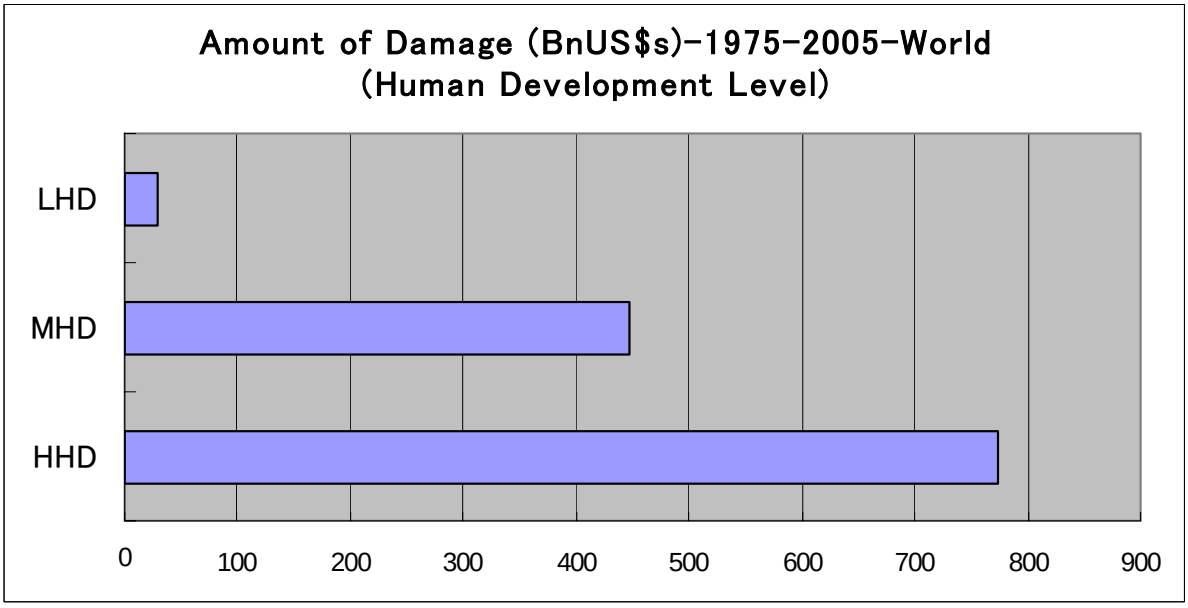
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 15B Total Affected People Per Million Population by Human Development Level, 2005 (Asia)



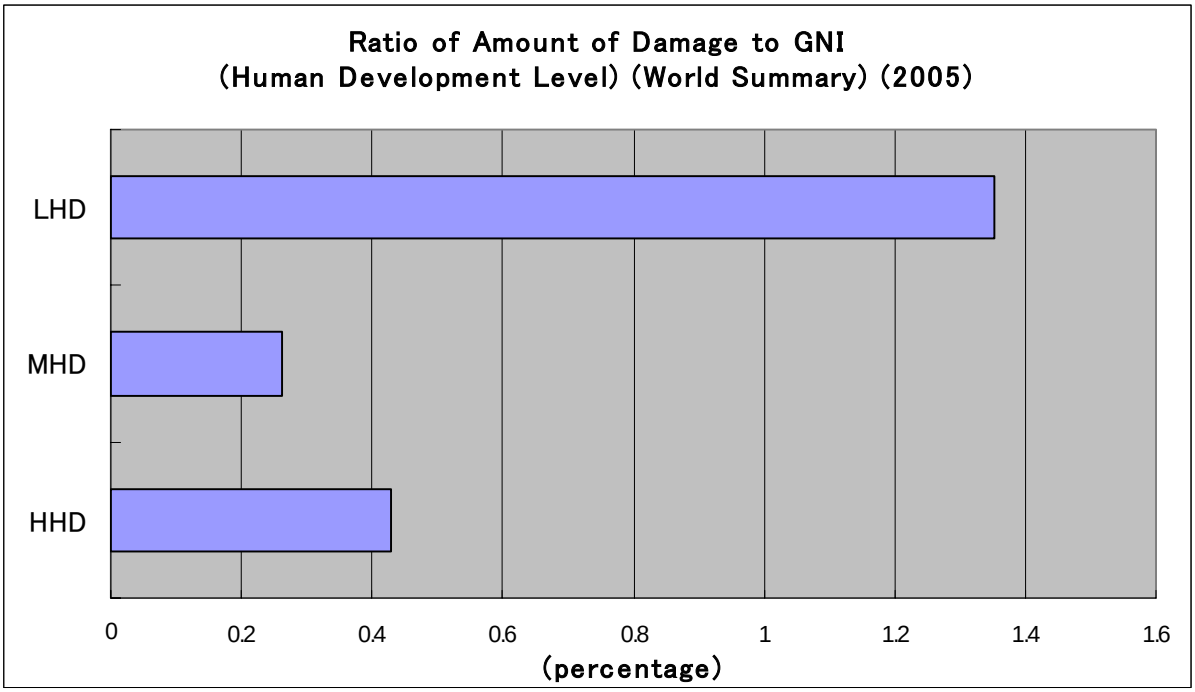
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 16 Amount of Damage (US$ Billions) by Human Development Level, 1975-2005 (World)



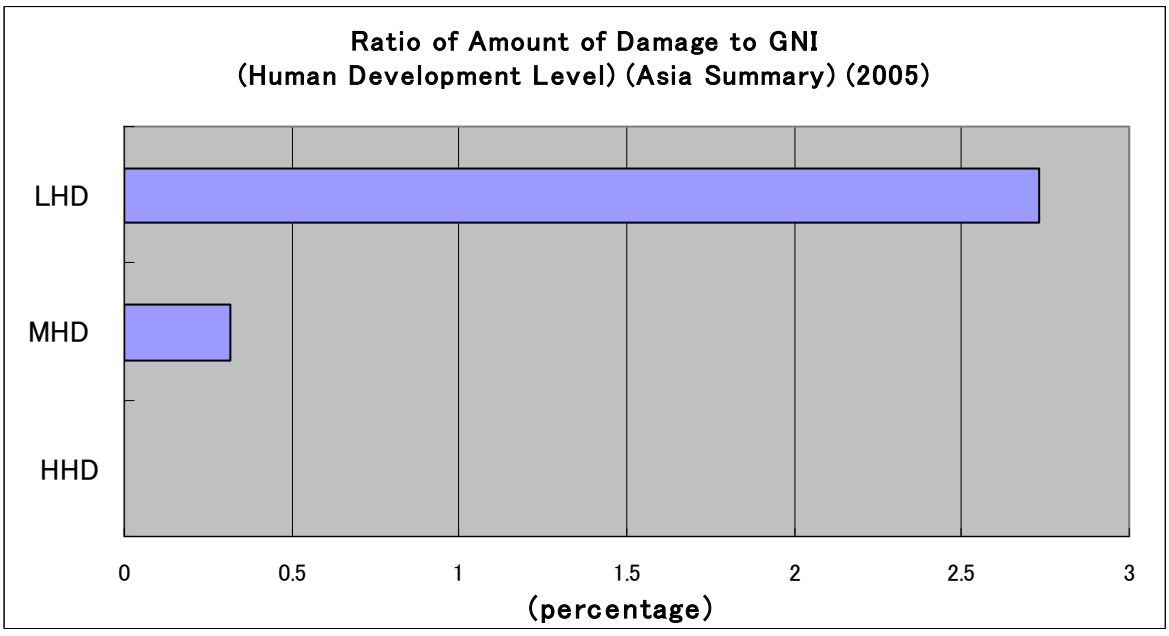
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 17A Ratio of Damage to GNI (%) by Human Development Level, 2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 17B Ratio of Damage to GNI (%) by Human Development Level, 2005 (Asia)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

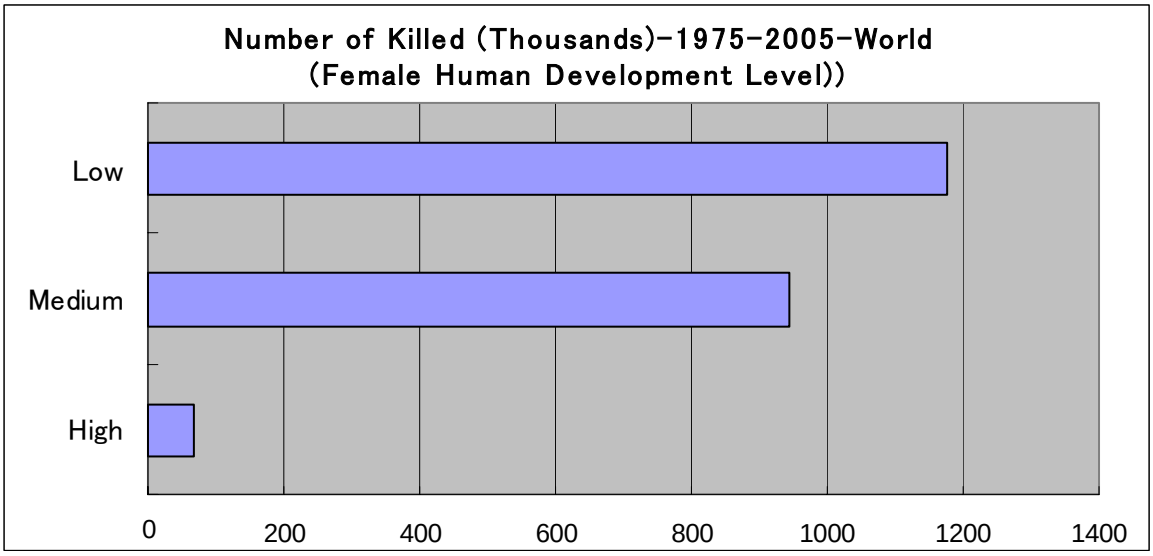
2.2 Gender Issues and Natural Disaster Impacts

In addition to what we have seen above with respect to overall human development and the impact of natural disasters, it is also of paramount importance that efforts be made to examine the relationship between gender and natural disasters. Here we examine the Female Human Development Index, which was extracted from the general Human Development Index, in relation to disasters. Generally speaking, countries with lower female human development (LFHD) report the most human suffering, and tend to have higher ratios of people killed and total affected people to the total population than countries with higher female human development levels (HFHD). The trend is very similar to the trend in general human development.

Accordingly, in 2005, both the ratios of the people killed and total affected people to the total population were high in countries with low and medium Female Human Development indicators due to the earthquakes, floods, and wind storms that struck many countries in Asia, especially the South Asian Earthquake, and floods in China, India, and Bangladesh (Figures 18, 19A, and 19B). Moreover, the ratio of total affected people to the total population was high in countries with low female human development, as shown in Figures 20, 21A, and 21B. Further, Figures 22, 23A, and 23B indicate that damage as a proportion of GNI is also relatively high in the low and medium female human development countries, although the amounts of actual damage are higher in high female human development countries. These figures highlight the importance of gender-related planning and mitigation strategies and approaches in the field of disaster management, especially in countries with low and medium female human development levels.

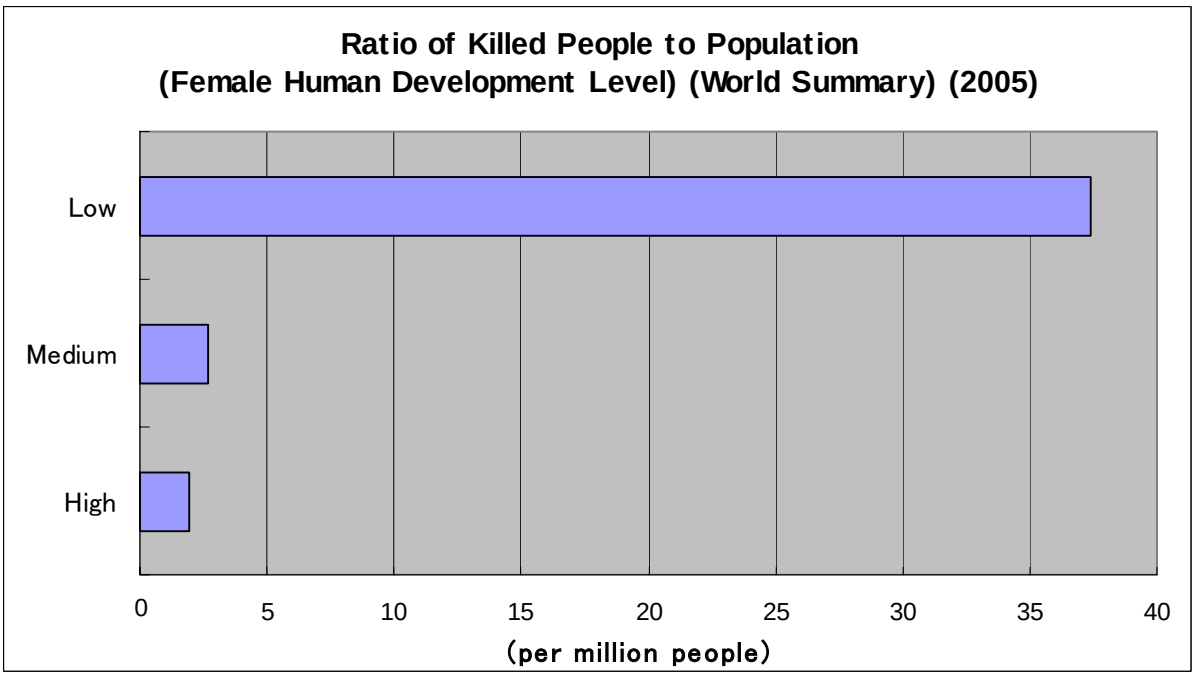
Gender powerfully shapes the human response to disasters, both directly and indirectly. Studies have shown that women are hit hard by the social impacts of disasters, suggesting that women should play a major role in post-disaster activities if proper integration of gender issues and disaster management is achieved. The reality is that women are always identified as active and resourceful disaster respondents, but are often regarded as helpless victims. Since disaster mitigation and risk management activities should be incorporated into development strategies, it is imperative to prevent gender bias and ensure women's participation in the field of development.

Figure 18 Number of People Killed (Thousands) by Female Human Development Level, 1975-2005 (World)



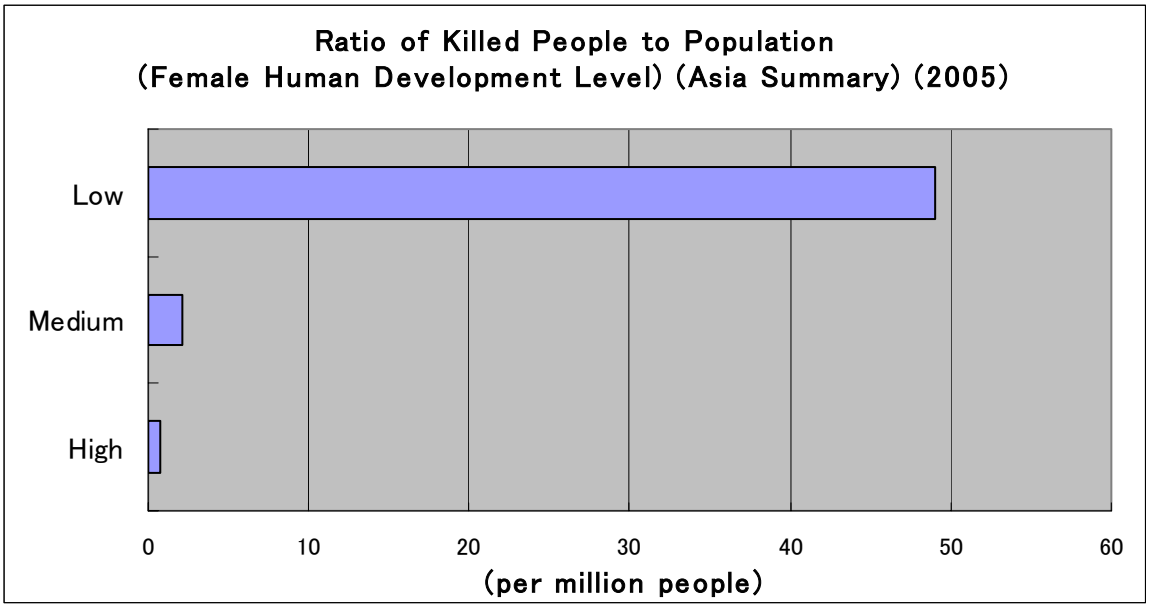
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 19A Ratio of People Killed to Population by Female Human Development Level, 2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

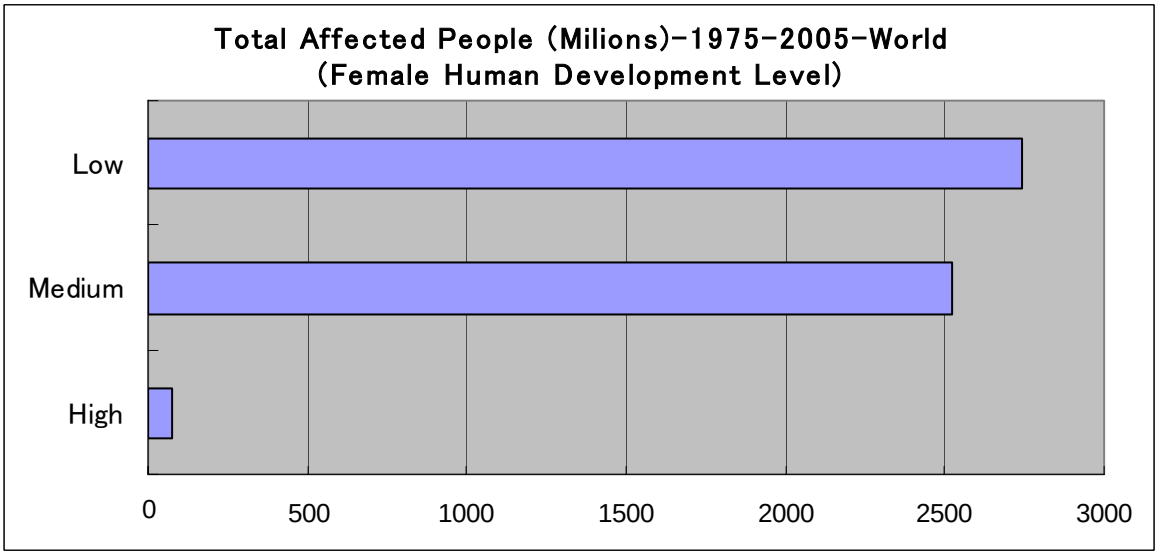
Figure 19B Ratio of People Killed to Population by Female Human Development Level, 2005 (Asia)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

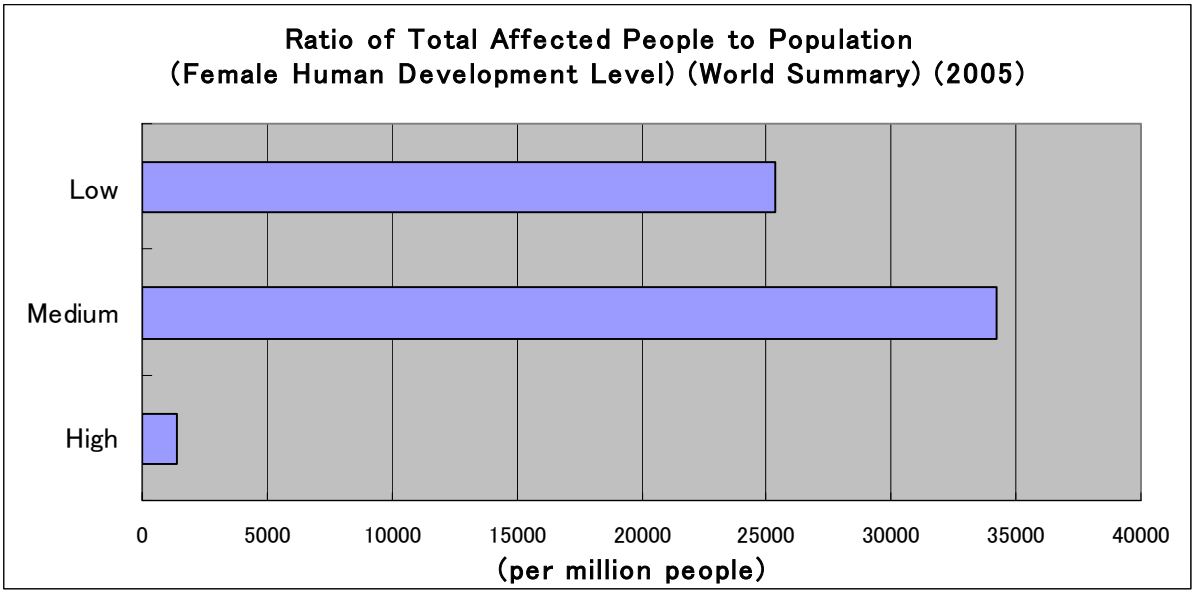
The above figures also indicate that the majority of human losses, both on a global and regional level, were sustained in countries with low and medium levels of female human development. This is attributed to the impact of the South Asian Earthquake.

Figure 20 Total Affected People (Millions) by Female Human Development Level, 1975-2005 (World)



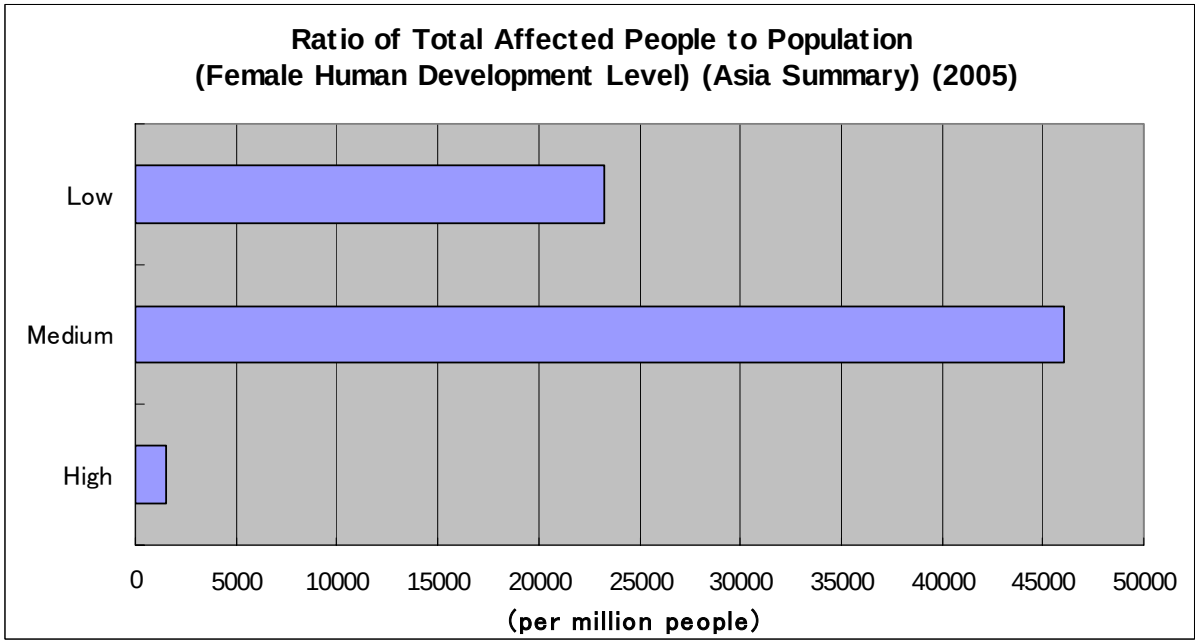
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 21A Total Affected People Per Million Population by Female Human Development Level, 2005 (World)



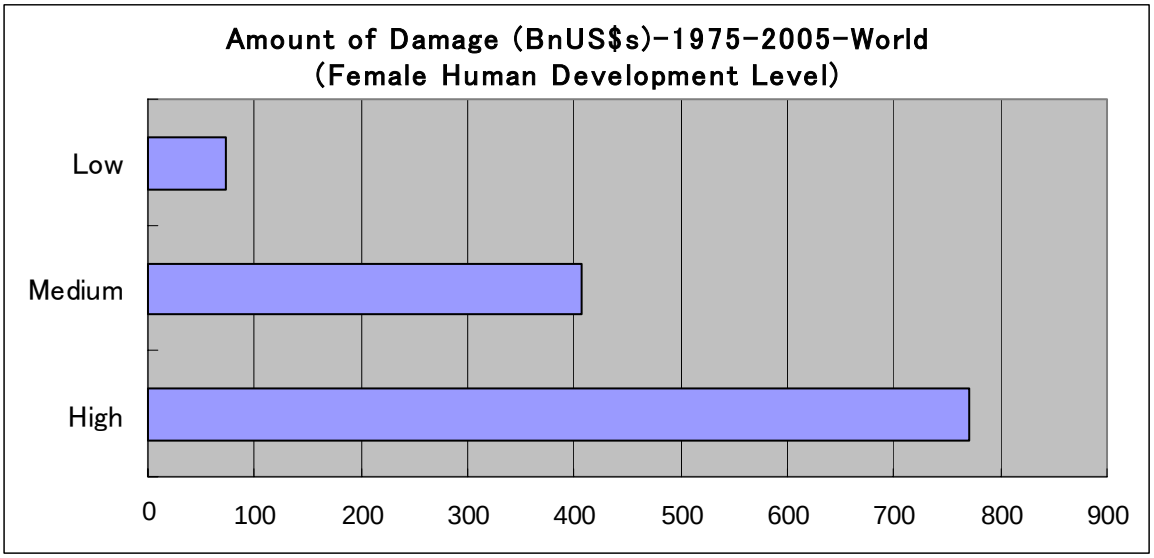
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 21B Total Affected People Per Million Population by Female Human Development Level, 2005 (Asia)



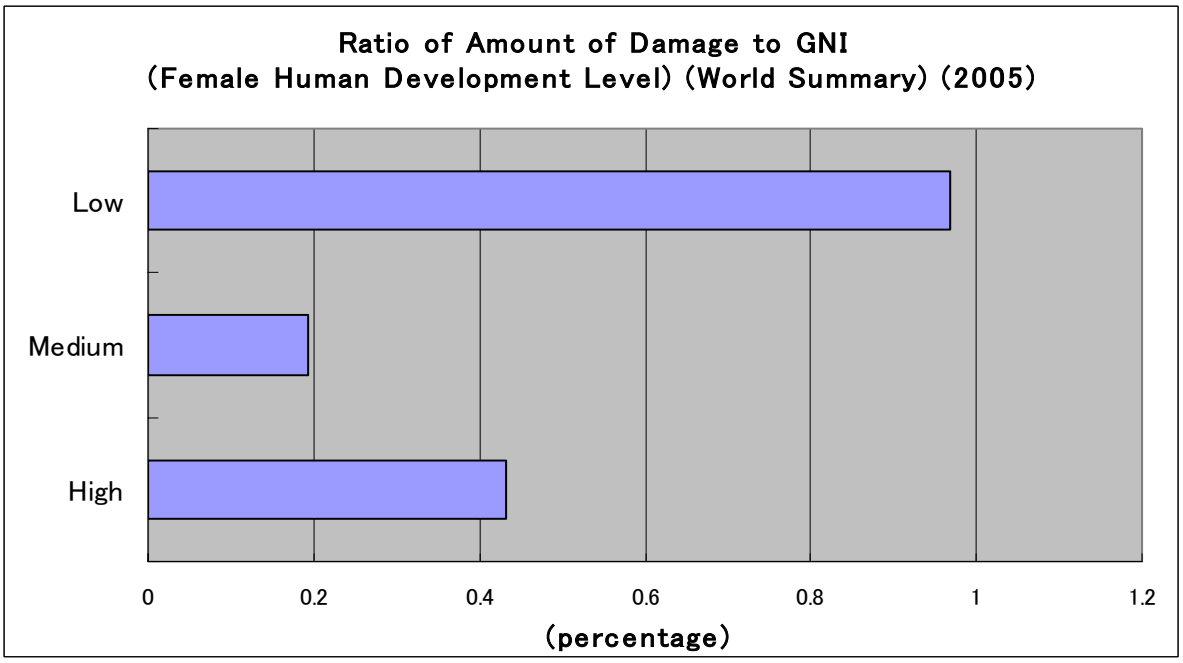
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 22 Amount of Damage (US$ Billions) by Female Human Development Level, 1975-2005 (World)



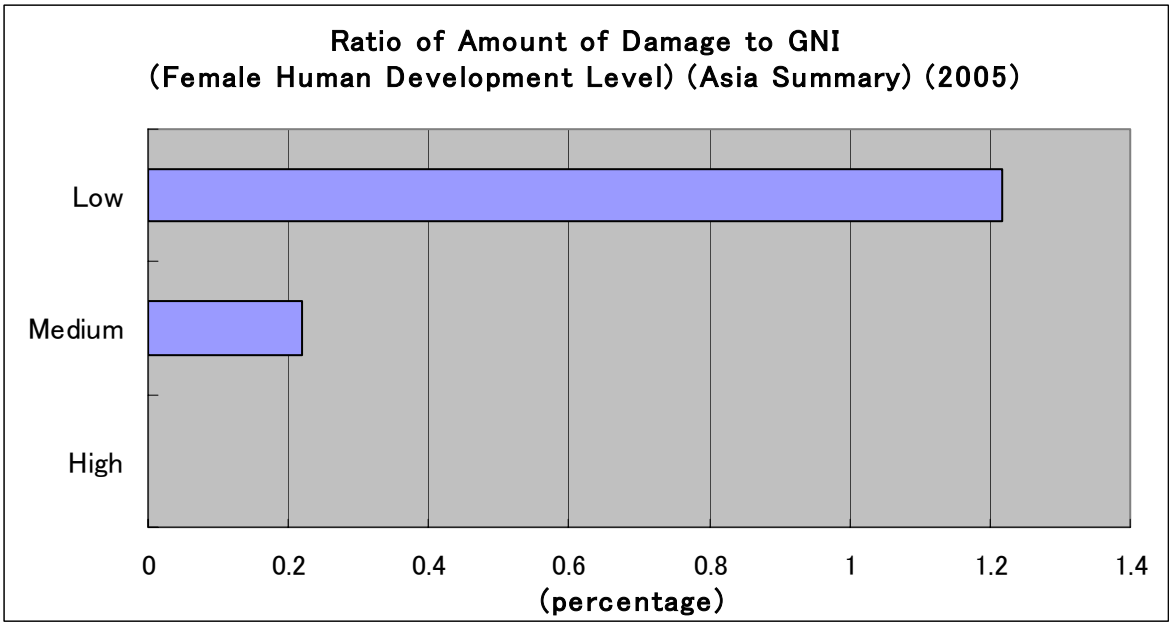
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 23A Ratio of Damage to GNI (%) by Female Human Development Level, 2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

Figure 23B Ratio of Damage to GNI (%) by Female Human Development Level, 2005 (Asia)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and UNDP, 2005

2.3 The Economics of Natural Disasters

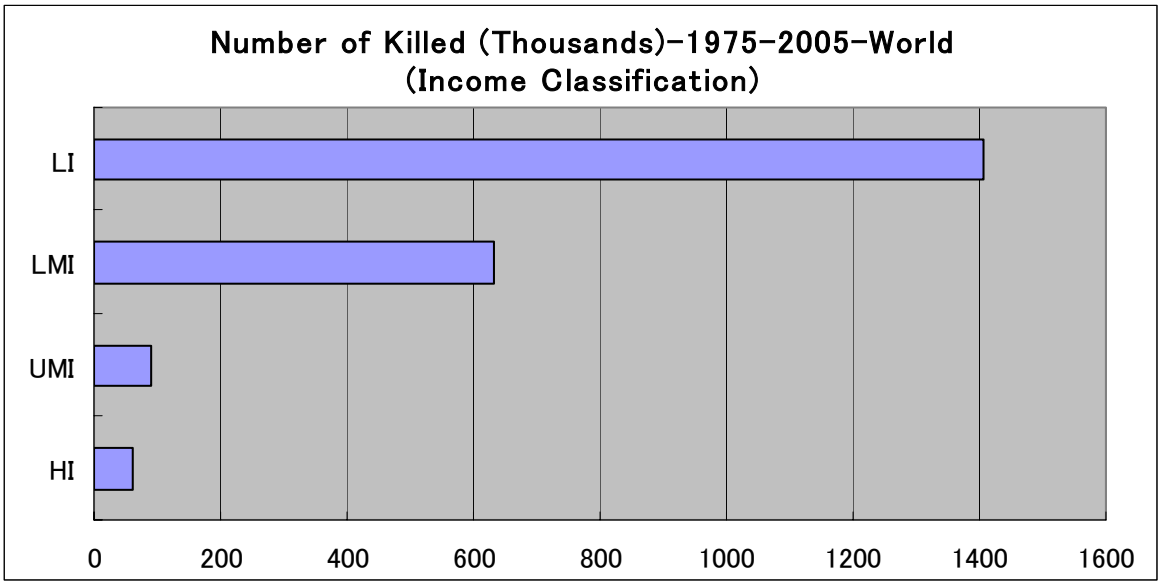
This section focuses on income levels as they relate to disaster impacts, based on the disaster trends in 2005. A country's income level is determined by its per capita GNI and is analyzed here in relation to the disaster statistics. The figures below (24 to 29B) show this relationship and once again indicate that the majority of human losses and affected people are reported in low and lower middle income countries. Although this could be attributed to the impacts of the South Asian Earthquake and flooding in the low-income and least developed Asian countries in 2005, the statistics are consistent with the longer-term trends. Figures 24, 26, and 28 show the global trends in the number of people killed, the total affected, and the amount of damage sustained, respectively, by income level for the period 1975-2005. Further, figures marked A and B show the ratio of these characteristics to the total population for the world (A) and Asia (B) in 2005.

Generally, though the real economic losses from disasters are higher in high-income countries due to their developed infrastructural framework and economic establishments that have accumulated social capital, disaster-related losses are more substantial in developing and lower-income countries, especially when viewed as a proportion of the GNIs of those countries. When human losses and suffering are considered, the low and lower middle income countries suffer greatly, as is further shown in the figures below. This firmly emphasizes the need for a holistic disaster management approach that gives due consideration to a country's disaster vulnerability, the impact and extent of disaster-related damage, and the impact of disasters on human development and the economy. This is clearly shown in Figures 28, 29A, and 29B.

The socio-economic impacts of disasters vary by the type of disaster, the disaster period (length), and the post-disaster recovery period. A country's income level plays a crucial role in determining how long it will take for a community to recover from a disaster. In addition, the national income level and magnitude of the socio-economic impacts of a disaster are proportionally related, and the ratio of such impacts to the country's GNI demonstrates the negative effects of disasters upon low and lower middle income countries. This explains the shapes of Figures 24 to 29B, as the ratio of human and economic losses to the total population and income level (GNI) is high in the low-income countries and low in the high-income countries. The disasters that have occurred in the Asian countries of India, Pakistan, Bangladesh, and China, and in some countries in Africa, have contributed significantly to this trend. The disasters that occurred in the US (hurricanes) and the extreme temperatures experienced in Europe contributed to the heavy damage sustained in the high-income countries, in proportion to their high GNIs. The figures below show these trends for the world and the Asian region.

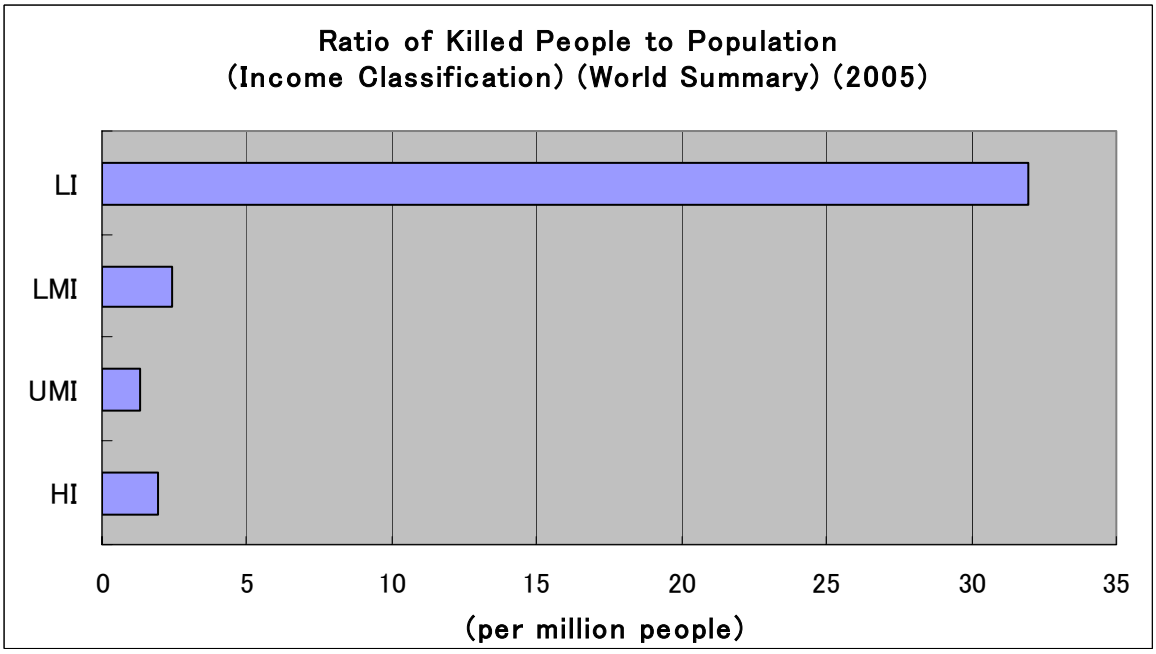
Note: LI: Lower Income, LMI: Lower Middle Income, UMI: Upper Middle Income and UI: Upper Income.

Figure 24 Number of People Killed (Thousands) by Income Classification, 1975-2005 (World)



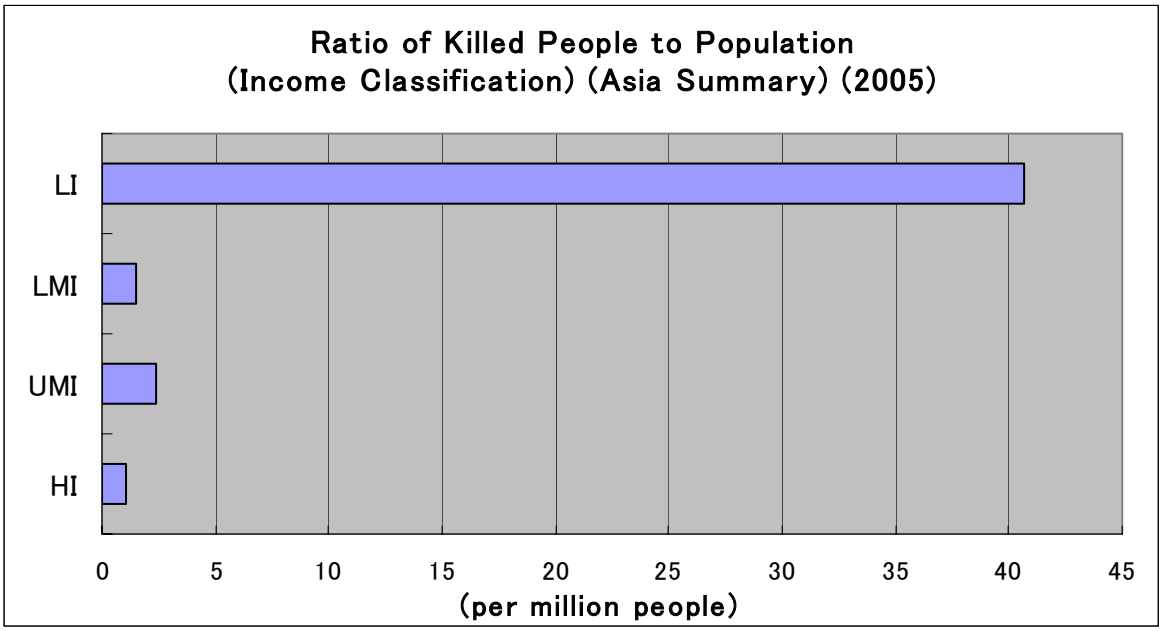
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 25A Ratio of People Killed to Population by Income Level, 2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

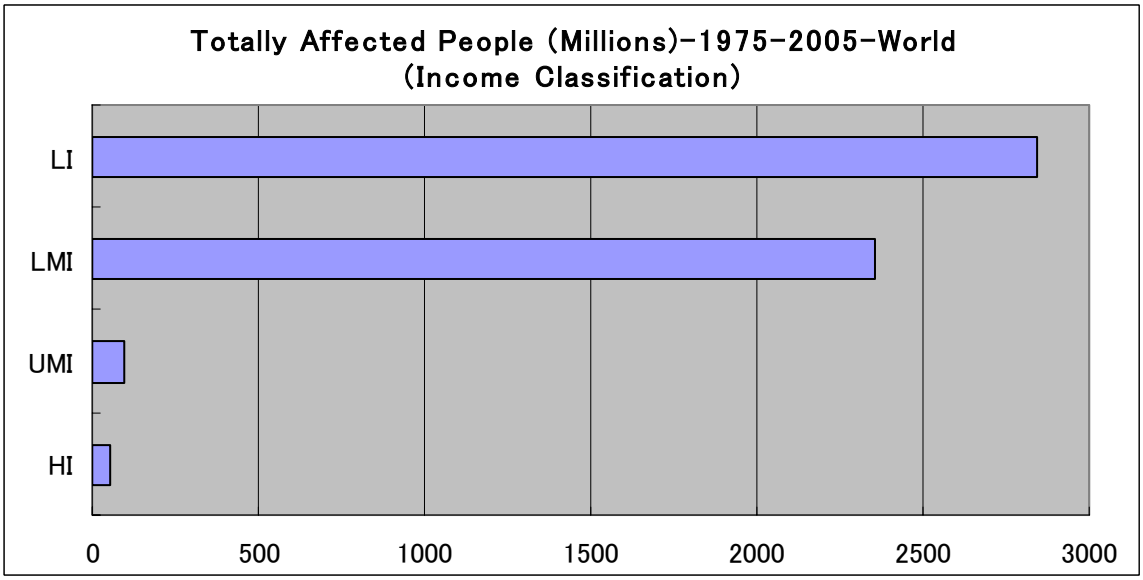
Figure 25B Ratio of People Killed to Population by Income Level, 2005 (Asia)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

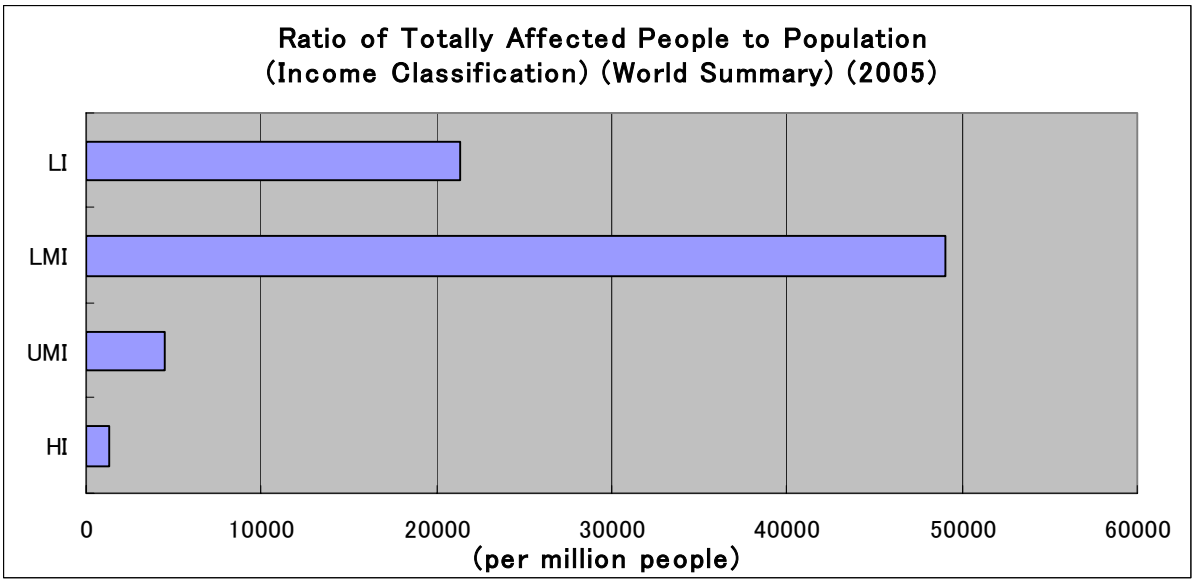
It is clearly known from above Figures that the majority of the human loss was in the low and lower middle income countries in the World as well as in Asia and these are due to the Souh Asian earthquake disaster.

Figure 26 Total Affected People (Millions) by Income Level, 1975-2005 (World)



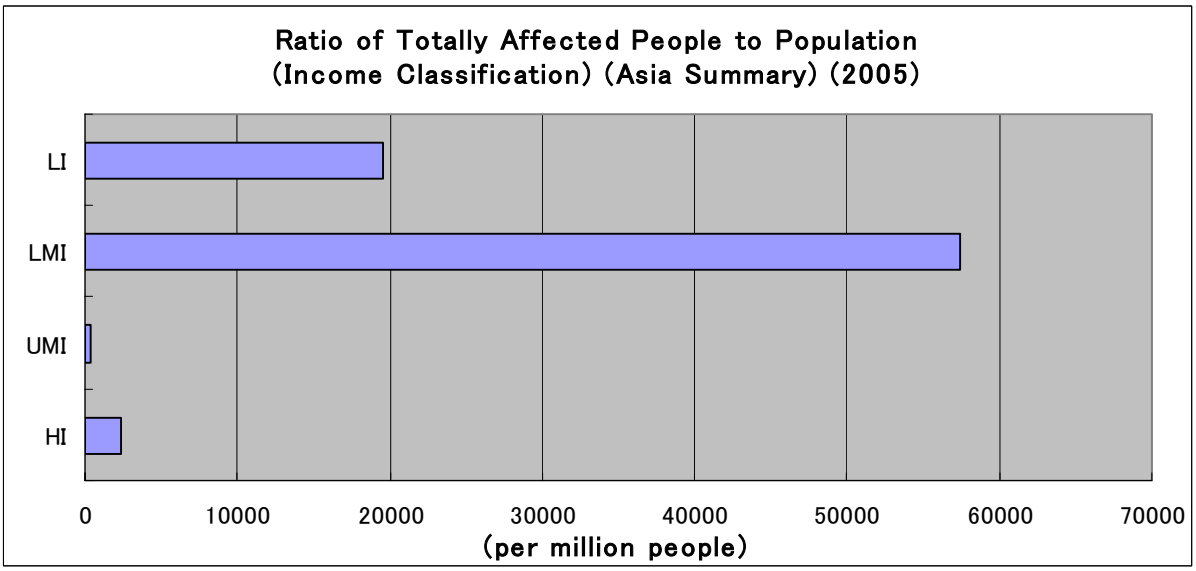
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 27A Total Affected People Per Million Population by Income Level, 2005 (World)



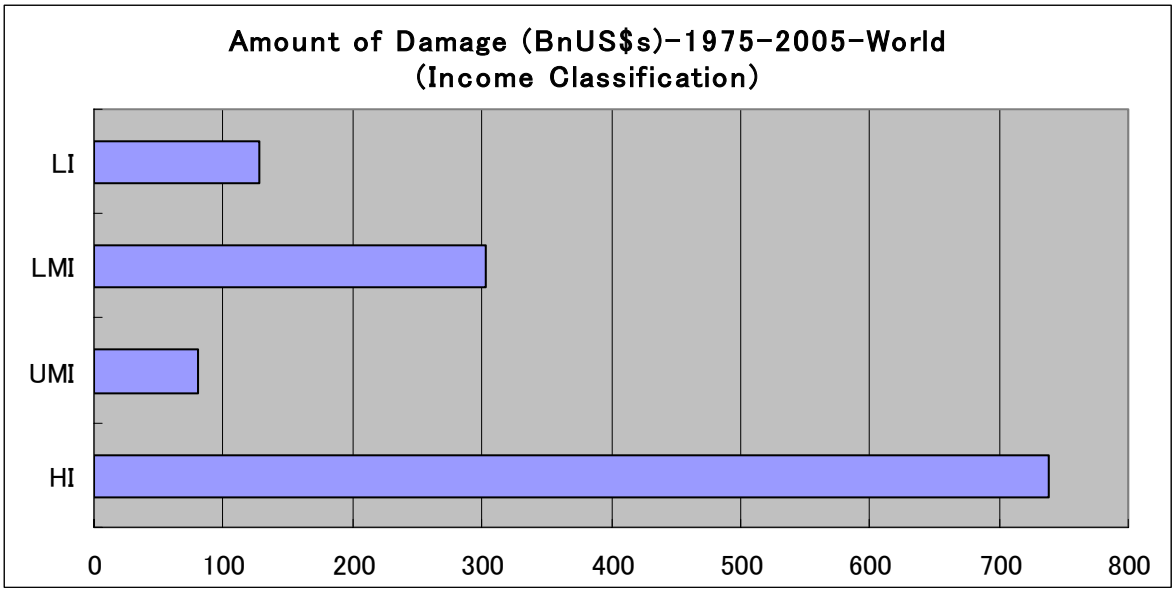
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 27B Total Affected People Per Million Population by Income Level, 2005 (Asia)



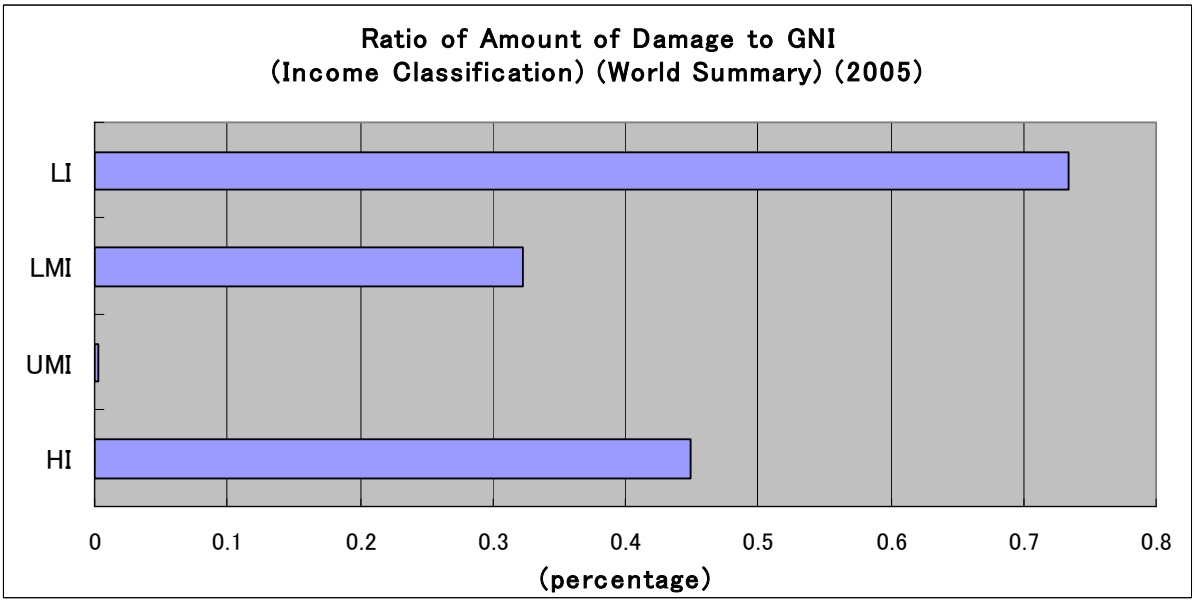
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 28 Amount of Damage (US$ Billions) by Income Level, 1975-2005 (World)



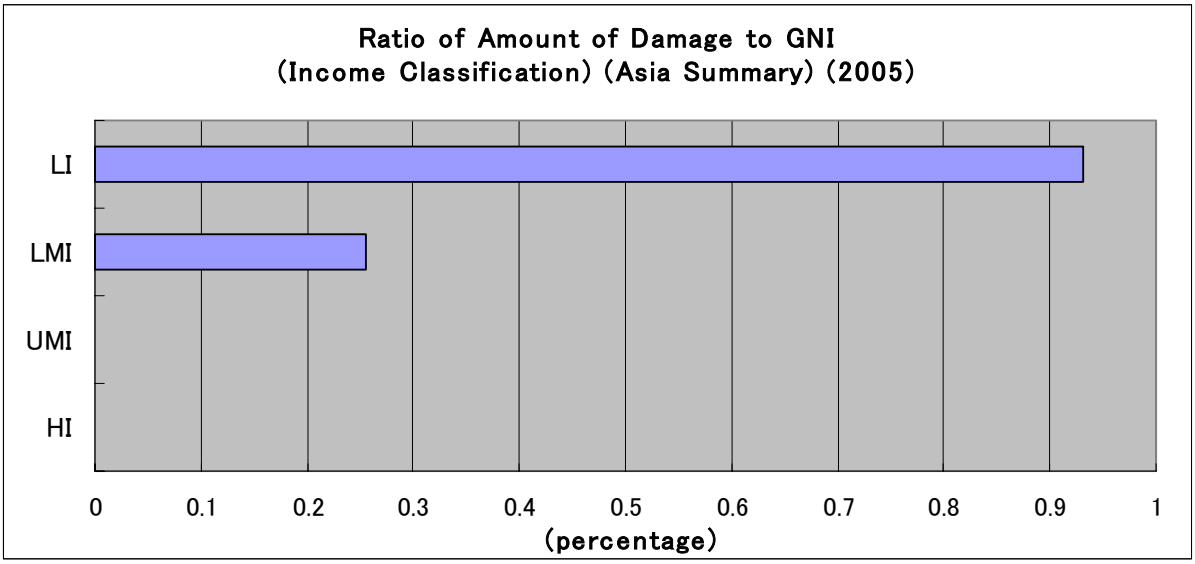
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 29A Ratio of Damage to GNI (%) by Income Level, 2005 (World)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 29B Ratio of Damage to GNI (%) by Income Level, 2005 (Asia)



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium and World Bank, 2005

Figure 28 shows the actual amount of damage sustained by countries with different income levels. Figures 29A and 29B depict the ratio of damage to GNI by income level. Clearly, the ratio of damage to GNI is high in the low income countries, mainly due to the various disasters that have occurred in the most vulnerable countries. In Asia, this ratio is high in the low income countries, primarily due to the earthquakes, typhoons, and floods experienced by India, Pakistan, China, and Bangladesh.

2.4 Disaster Classifications and the Impact of Development Characteristics

We have classified disasters into geo-physical, hydro-meteorological, and other disasters. Earthquakes, volcanic eruptions, earthquake-induced tsunamis, and landslides are categorized as geo-physical disasters, while wind storms, floods, extreme temperatures, droughts, and heavy rain-induced landslides are categorized as hydro-meteorological disasters. All other disasters, including famines and epidemics, are included in the "other" category. The tables below show the disaster classifications and their impact on development for the period 1975-2005. Tables 10A, 10B, 11A, and 11B show the disaster classifications by region and vice versa. Similarly, Tables 12A, 12B, 13A, and 13B show the disaster classification by income classification and vice versa. Finally, Tables 14A, 14B, 15A, and 15B show the disaster patterns by human development level.

These tables make it clear that hydro-meteorological disasters produce the largest numbers of total affected people in Asia, while geo-physical disasters produce the largest numbers of people killed. The region is vulnerable to both types of disasters due to its geographical position and socio-economic characteristics. Africa is more vulnerable to hydro-meteorological disasters, as it is prone to prolonged droughts. The Americas, Asia, and Europe sustain most of their economic damage from hydro-meteorological disasters, with high-income countries like the US, Japan, and the EU countries facing heavy losses caused by wind storms, floods, and extreme temperatures. The heaviest damage in Asia was caused by Japan’s 1995 Great Hanshin-Awaji Earthquake and the 2004 Indian Ocean Tsunami.

Similarly, low income and lower middle income countries tend to be most vulnerable to hydro-meteorological disasters, but also moderately vulnerable to geo-physical disasters. Low and medium human development countries follow the same trend. Since hydro-meteorological disasters tend to be annual events, they cause much more damage to the low and medium human development countries than geo-physical disasters. The following tables clearly show these trends by region, human development level, and income level. Once again, the facts underscore the need to integrate disaster reduction strategies and human development efforts, and the need for governments to take note of this important concept and ensure its inclusion in their policy frameworks.

Table 10A: 1975-2005 Disasters and Impacts by Disaster Classification and Region

Disaster Classification	Continent	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Geo Phy Dis	Africa	69	9,175	2,085,894	8,755,608
	Americas	205	66,590	12,949,330	58,526,032
	Asia	464	784,521	75,158,386	256,459,233
	Europe	173	8,724	2,836,768	34,369,376
	Oceania	100	2,976	317,655	2,907,400
Geo Phy Dis Total		**1,011**	**871,986**	**93,348,033**	**361,017,649**
Hyd Met Dis	Africa	944	578,751	342,482,272	9,931,189
	Americas	1,551	99,515	141,399,236	385,185,187
	Asia	2,337	421,307	4,654,039,361	274,930,538
	Europe	832	41,472	23,974,358	170,036,326
	Oceania	404	1,524	19,480,782	20,434,267
Hyd Met Dis Total		**6,068**	**1,142,569**	**5,181,376,009**	**860,517,507**
Others	Africa	618	112,812	42,372,907	102,430
	Americas	169	14,496	2,989,617	5,670,700
	Asia	306	46,083	18,627,876	19,240,824
	Europe	109	768	3,528,539	3,118,249
	Oceania	38	402	80,799	1,162,006
Others Total		**1,240**	**174,561**	**67,599,738**	**29,294,209**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 10B: 1975-2005 Disasters and Impacts by Disaster Classification and Region (Percentages)

Disaster Classification	Continent	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Geo Phy Dis	Africa	0.83%	0.42%	0.04%	0.70%
	Americas	2.46%	3.04%	0.24%	4.68%
	Asia	5.58%	35.84%	1.41%	20.50%
	Europe	2.08%	0.40%	0.05%	2.75%
	Oceania	1.20%	0.14%	0.01%	0.23%
Geo Phy Dis Total		**12.15%**	**39.83%**	**1.75%**	**28.86%**
Hyd Met Dis	Africa	11.35%	26.44%	6.41%	0.79%
	Americas	18.64%	4.55%	2.65%	30.79%
	Asia	28.09%	19.25%	87.12%	21.98%
	Europe	10.00%	1.89%	0.45%	13.59%
	Oceania	4.86%	0.07%	0.36%	1.63%
Hyd Met Dis Total		**72.94%**	**52.19%**	**96.99%**	**68.80%**
Others	Africa	7.43%	5.15%	0.79%	0.01%
	Americas	2.03%	0.66%	0.06%	0.45%
	Asia	3.68%	2.11%	0.35%	1.54%
	Europe	1.31%	0.04%	0.07%	0.25%
	Oceania	0.46%	0.02%	0.00%	0.09%
Others Total		**14.91%**	**7.97%**	**1.27%**	**2.34%**
Grand Total		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 11A: 1975-2005 Disasters and Impacts by Region and Disaster Classification

Continent	Dis Classification	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Africa	Geo Phy Dis	69	9,175	2,085,894	8,755,608
	Hyd Met Dis	944	578,751	342,482,272	9,931,189
	Others	618	112,812	42,372,907	102,430
Africa Total		**1,631**	**700,738**	**386,941,073**	**18,789,227**
Americas	Geo Phy Dis	205	66,590	12,949,330	58,526,032
	Hyd Met Dis	1,551	99,515	141,399,236	385,185,187
	Others	169	14,496	2,989,617	5,670,700
Americas Total		**1,925**	**180,601**	**157,338,183**	**449,381,919**
Asia	Geo Phy Dis	464	784,521	75,158,386	256,459,233
	Hyd Met Dis	2,337	421,307	4,654,039,361	274,930,538
	Others	306	46,083	18,627,876	19,240,824
Asia Total		**3,107**	**1,251,911**	**4,747,825,623**	**550,630,595**
Europe	Geo Phy Dis	173	8,724	2,836,768	34,369,376
	Hyd Met Dis	832	41,472	23,974,358	170,036,326
	Others	109	768	3,528,539	3,118,249
Europe Total		**1,114**	**50,964**	**30,339,665**	**207,523,951**
Oceania	Geo Phy Dis	100	2,976	317,655	2,907,400
	Hyd Met Dis	404	1,524	19,480,782	20,434,267
	Others	38	402	80,799	1,162,006
Oceania Total		**542**	**4,902**	**19,879,236**	**24,503,673**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 11B: 1975-2005 Disasters and Impacts by Region and Disaster Classification (Percentages)

Continent	Dis Classification	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Africa	Geo Phy Dis	0.83%	0.42%	0.04%	0.70%
	Hyd Met Dis	11.35%	26.44%	6.41%	0.79%
	Others	7.43%	5.15%	0.79%	0.01%
Africa Total		**19.61%**	**32.01%**	**7.24%**	**1.50%**
Americas	Geo Phy Dis	2.46%	3.04%	0.24%	4.68%
	Hyd Met Dis	18.64%	4.55%	2.65%	30.79%
	Others	2.03%	0.66%	0.06%	0.45%
Americas Total		**23.14%**	**8.25%**	**2.95%**	**35.93%**
Asia	Geo Phy Dis	5.58%	35.84%	1.41%	20.50%
	Hyd Met Dis	28.09%	19.25%	87.12%	21.98%
	Others	3.68%	2.11%	0.35%	1.54%
Asia Total		**37.35%**	**57.19%**	**88.87%**	**44.02%**
Europe	Geo Phy Dis	2.08%	0.40%	0.05%	2.75%
	Hyd Met Dis	10.00%	1.89%	0.45%	13.59%
	Others	1.31%	0.04%	0.07%	0.25%
Europe Total		**13.39%**	**2.33%**	**0.57%**	**16.59%**
Oceania	Geo Phy Dis	1.20%	0.14%	0.01%	0.23%
	Hyd Met Dis	4.86%	0.07%	0.36%	1.63%
	Others	0.46%	0.02%	0.00%	0.09%
Oceania Total		**6.52%**	**0.22%**	**0.37%**	**1.96%**
Grand Total		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 12A: 1975-2005 Disasters and Impacts by Disaster Classification and Income Level

Disaster Classification	Income class	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Geo Phy Dis	HI	173	10,604	6,052,601	247,796,421
	LI	268	340,791	51,180,173	41,360,509
	LMI	440	484,486	31,263,278	46,641,159
	UMI	130	36,105	4,851,981	25,219,560
Geo Phy Dis Total		**1,011**	**871,986**	**93,348,033**	**361,017,649**
Hyd Met Dis	HI	1,464	48,824	44,754,726	482,092,329
	LI	1,941	910,485	2,731,168,032	67,715,267
	LMI	1,883	130,152	2,317,587,367	255,310,850
	UMI	780	53,108	87,865,884	55,399,061
Hyd Met Dis Total		**6,068**	**1,142,569**	**5,181,376,009**	**860,517,507**
Others	HI	154	604	2,685,217	8,795,056
	LI	791	155,225	58,459,222	19,263,829
	LMI	211	16,860	5,530,802	618,074
	UMI	84	1,872	924,497	617,250
Others Total		**1,240**	**174,561**	**67,599,738**	**29,294,209**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 12B: 1975-2005 Disasters and Impacts by Disaster Classification and Income Level (Percentages)

Disaster Classification	Income class	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Geo Phy Dis	HI	2.08%	0.48%	0.11%	19.81%
	LI	3.22%	15.57%	0.96%	3.31%
	LMI	5.29%	22.13%	0.59%	3.73%
	UMI	1.56%	1.65%	0.09%	2.02%
Geo Phy Dis Total		**12.15%**	**39.83%**	**1.75%**	**28.86%**
Hyd Met Dis	HI	17.60%	2.23%	0.84%	38.54%
	LI	23.33%	41.59%	51.12%	5.41%
	LMI	22.63%	5.95%	43.38%	20.41%
	UMI	9.38%	2.43%	1.64%	4.43%
Hyd Met Dis Total		**72.94%**	**52.19%**	**96.99%**	**68.80%**
Others	HI	1.85%	0.03%	0.05%	0.70%
	LI	9.51%	7.09%	1.09%	1.54%
	LMI	2.54%	0.77%	0.10%	0.05%
	UMI	1.01%	0.09%	0.02%	0.05%
Others Total		**14.91%**	**7.97%**	**1.27%**	**2.34%**
Grand Total		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 13A: 1975-2005 Disasters and Impacts by Income Level and Disaster Classification

Income class	Disaster Classification	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
HI	Geo Phy Dis	173	10,604	6,052,601	247,796,421
	Hyd Met Dis	1,464	48,824	44,754,726	482,092,329
	Others	154	604	2,685,217	8,795,056
HI Total		**1,791**	**60,032**	**53,492,544**	**738,683,806**
LI	Geo Phy Dis	268	340,791	51,180,173	41,360,509
	Hyd Met Dis	1,941	910,485	2,731,168,032	67,715,267
	Others	791	155,225	58,459,222	19,263,829
LI Total		**3,000**	**1,406,501**	**2,840,807,427**	**128,339,605**
LMI	Geo Phy Dis	440	484,486	31,263,278	46,641,159
	Hyd Met Dis	1,883	130,152	2,317,587,367	255,310,850
	Others	211	16,860	5,530,802	618,074
LMI Total		**2,534**	**631,498**	**2,354,381,447**	**302,570,083**
UMI	Geo Phy Dis	130	36,105	4,851,981	25,219,560
	Hyd Met Dis	780	53,108	87,865,884	55,399,061
	Others	84	1,872	924,497	617,250
UMI Total		**994**	**91,085**	**93,642,362**	**81,235,871**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 13B: 1975-2005 Disasters and Impacts by Income Level and Disaster Classification (Percentages)

Income class	Disaster Classification	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
HI	Geo Phy Dis	2.08%	0.48%	0.11%	19.81%
	Hyd Met Dis	17.60%	2.23%	0.84%	38.54%
	Others	1.85%	0.03%	0.05%	0.70%
HI Total		**21.53%**	**2.74%**	**1.00%**	**59.06%**
LI	Geo Phy Dis	3.22%	15.57%	0.96%	3.31%
	Hyd Met Dis	23.33%	41.59%	51.12%	5.41%
	Others	9.51%	7.09%	1.09%	1.54%
LI Total		**36.06%**	**64.25%**	**53.18%**	**10.26%**
LMI	Geo Phy Dis	5.29%	22.13%	0.59%	3.73%
	Hyd Met Dis	22.63%	5.95%	43.38%	20.41%
	Others	2.54%	0.77%	0.10%	0.05%
LMI Total		**30.46%**	**28.85%**	**44.07%**	**24.19%**
UMI	Geo Phy Dis	1.56%	1.65%	0.09%	2.02%
	Hyd Met Dis	9.38%	2.43%	1.64%	4.43%
	Others	1.01%	0.09%	0.02%	0.05%
UMI Total		**11.95%**	**4.16%**	**1.75%**	**6.49%**
Grand Total		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 14A: 1975-2005 World Disaster Classification and Impact Characteristics by Disaster Classification and Human Development Level

Disaster Classification	Human development	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Geo Phy Dis	HHD	213	10,962	7,944,521	249,983,581
	LHD	79	88,433	6,737,499	5,564,000
	MHD	719	772,591	78,666,013	105,470,068
Geo Phy Dis Total		**1,011**	**871,986**	**93,348,033**	**361,017,649**
Hyd Met Dis	HHD	1,748	55,890	64,130,864	513,439,004
	LHD	1,113	781,851	709,221,031	24,383,318
	MHD	3,207	304,828	4,408,024,114	322,695,185
Hyd Met Dis Total		**6,068**	**1,142,569**	**5,181,376,009**	**860,517,507**
Others	HHD	181	875	2,892,354	9,372,806
	LHD	569	117,524	37,884,934	106,930
	MHD	490	56,162	26,822,450	19,814,473
Others Total		**1,240**	**174,561**	**67,599,738**	**29,294,209**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 14B: 1975-2005 Disasters and Impacts by Disaster Classification and Human Development Level (Percentages)

Disaster Classification	Human development	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
Geo Phy Dis	HHD	2.56%	0.50%	0.15%	19.99%
	LHD	0.95%	4.04%	0.13%	0.44%
	MHD	8.64%	35.29%	1.47%	8.43%
Geo Phy Dis Total		**12.15%**	**39.83%**	**1.75%**	**28.86%**
Hyd Met Dis	HHD	21.01%	2.55%	1.20%	41.05%
	LHD	13.38%	35.72%	13.28%	1.95%
	MHD	38.55%	13.92%	82.51%	25.80%
Hyd Met Dis Total		**72.94%**	**52.19%**	**96.99%**	**68.80%**
Others	HHD	2.18%	0.04%	0.05%	0.75%
	LHD	6.84%	5.37%	0.71%	0.01%
	MHD	5.89%	2.57%	0.50%	1.58%
Others Total		**14.91%**	**7.97%**	**1.27%**	**2.34%**
Grand Total		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 15A: 1975-2005 Disasters and Impacts by Human Development Level and Disaster Classification

Human development	Disaster Classification	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
HHD	Geo Phy Dis	213	10,962	7,944,521	249,983,581
	Hyd Met Dis	1,748	55,890	64,130,864	513,439,004
	Others	181	875	2,892,354	9,372,806
HHD Total		**2,142**	**67,727**	**74,967,739**	**772,795,391**
LHD	Geo Phy Dis	79	88,433	6,737,499	5,564,000
	Hyd Met Dis	1,113	781,851	709,221,031	24,383,318
	Others	569	117,524	37,884,934	106,930
LHD Total		**1,761**	**987,808**	**753,843,464**	**30,054,248**
MHD	Geo Phy Dis	719	772,591	78,666,013	105,470,068
	Hyd Met Dis	3,207	304,828	4,408,024,114	322,695,185
	Others	490	56,162	26,822,450	19,814,473
MHD Total		**4,416**	**1,133,581**	**4,513,512,577**	**447,979,726**
Grand Total		**8,319**	**2,189,116**	**5,342,323,780**	**1,250,829,365**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 15B: 1975-2005 Disasters and Impacts by Human Development Level and Disaster Classification (Percentages)

Human development	Disaster Classification	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of DamageUS ('000s)
HHD	Geo Phy Dis	2.56%	0.50%	0.15%	19.99%
	Hyd Met Dis	21.01%	2.55%	1.20%	41.05%
	Others	2.18%	0.04%	0.05%	0.75%
HHD Total		**25.75%**	**3.09%**	**1.40%**	**61.78%**
LHD	Geo Phy Dis	0.95%	4.04%	0.13%	0.44%
	Hyd Met Dis	13.38%	35.72%	13.28%	1.95%
	Others	6.84%	5.37%	0.71%	0.01%
LHD Total		**21.17%**	**45.12%**	**14.11%**	**2.40%**
MHD	Geo Phy Dis	8.64%	35.29%	1.47%	8.43%
	Hyd Met Dis	38.55%	13.92%	82.51%	25.80%
	Others	5.89%	2.57%	0.50%	1.58%
MHD Total		**53.08%**	**51.78%**	**84.49%**	**35.81%**
Grand Total		**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

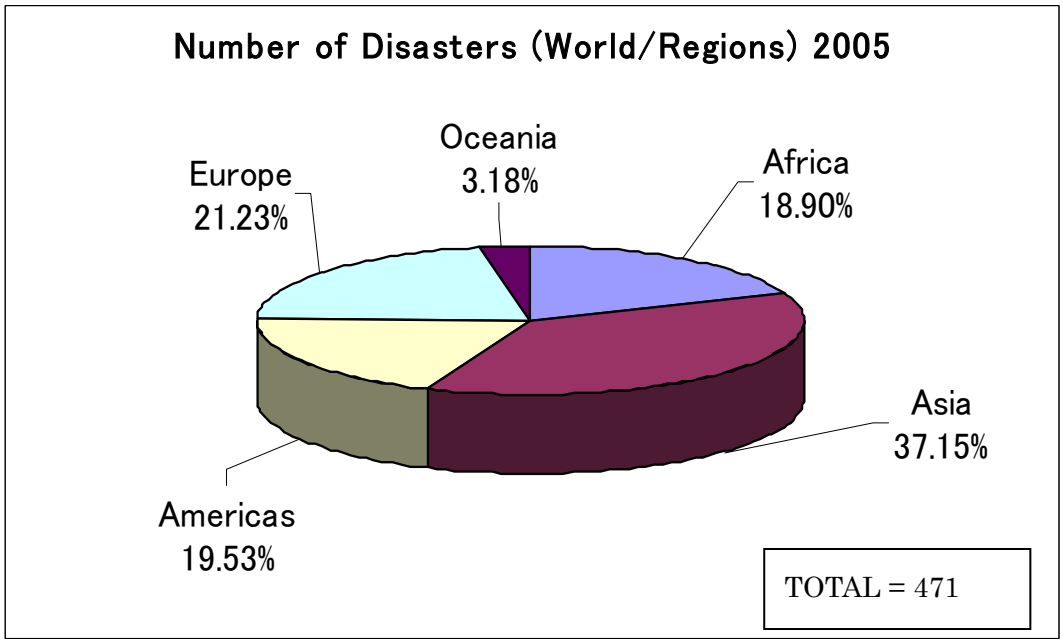
The extent of damage caused by natural disasters is clearly connected to a country's socio-economic level. As in previous years, the disaster statistics and trends for 2005 show that disaster management and post-disaster activities are crucial to sustainable development. In 2005, as in many previous years, the impacts of natural disasters were closely related to poverty, education, quality of health, gender related issues, and changing policy scenarios in relation to global socio-economic characteristics. Hence, disaster mitigation and management strategies must incorporate these components to create a holistic disaster management approach that includes strategies for sustainable development.

Chapter 3: Regional Characteristics of Natural Disasters

3.1 Proportion of Natural Disasters by Region

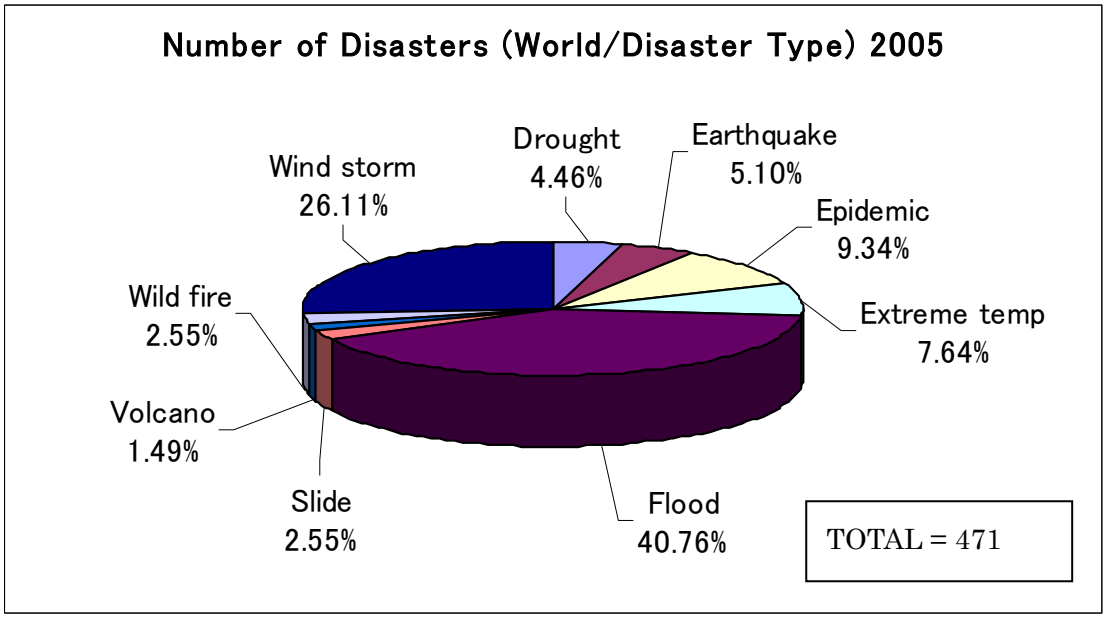
As in the previous year, Asia accounted for most of the devastating disasters that occurred in 2005 (37%, almost the same as 2004), followed by Europe (21%), the Americas (19%), Africa (19%), and Oceania (3%). Although the 2005 disaster trends look similar to those for 2004, their impacts in terms of human and economic losses were different. Figure 30A summarizes the 2005 data visually. Figure 30B summarizes the world data by type of disaster. The majority of the disasters in 2005 were floods and wind storms followed by epidemics, extreme temperatures, earthquakes, and droughts.

Figure 30A Proportion of Worldwide Disasters by Region, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

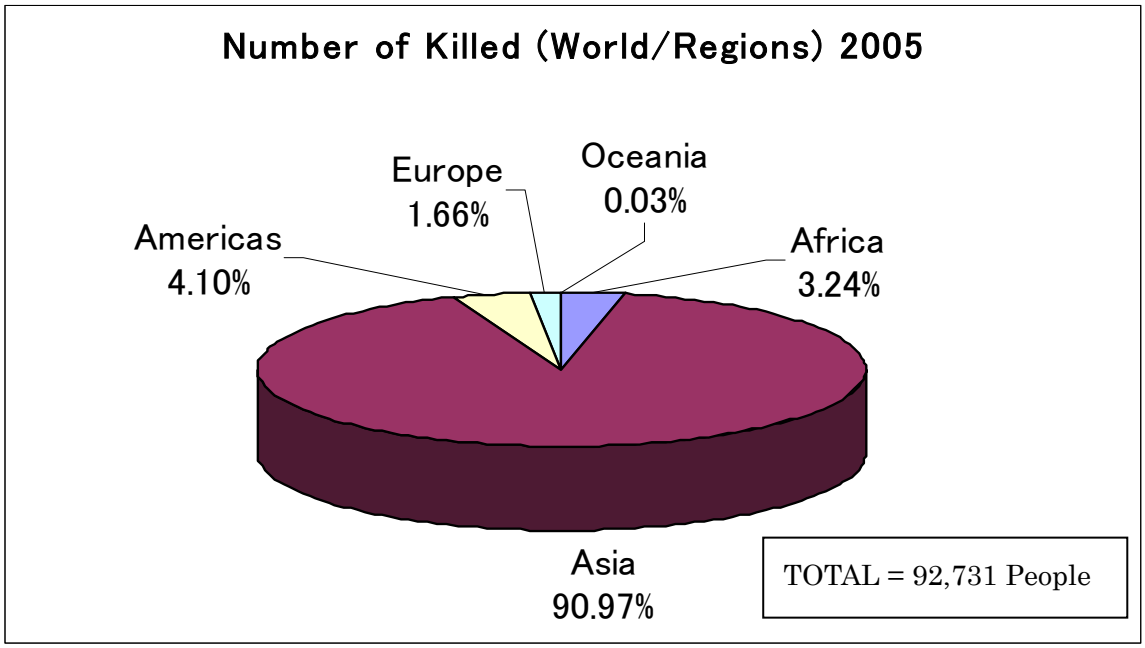
Figure 30B Proportion of Worldwide Disasters by Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

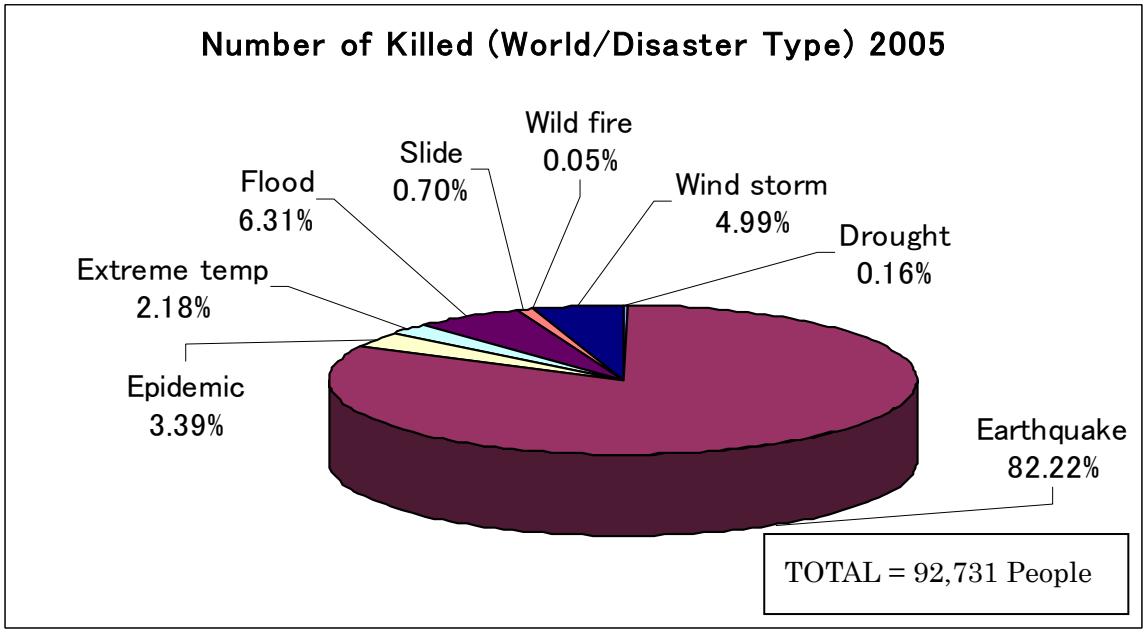
As can be seen in Figure 31A, the majority of people killed by natural disasters in the year 2005 lived in Asia, which accounted for 91% of the total number of people killed by disasters worldwide (down 5% from the previous year). This is due to the catastrophic South Asian Earthquake that struck India and Pakistan. Asia. Another significant region is the Americas, which accounted for 4% of the people killed in 2005 (up from the previous year). The number of people killed in Africa increased from 2% in 2004 to 3% in 2005. Europe also saw an increase in people killed, from 0.1% in 2004 to 2% in 2005. This was due to the extreme weather condition that prevailed in Europe in 2005. Oceania registered almost the same number of people killed by natural disasters as in the previous year. The heavy death toll in Asia caused by the South Asian earthquake makes other regions' figures look smaller in 2005. Earthquakes were responsible for the majority of the death toll worldwide (82%), followed by floods and wind storms, as shown in Figure 31B.

Figure 31A Proportion of People Killed Worldwide by Region, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

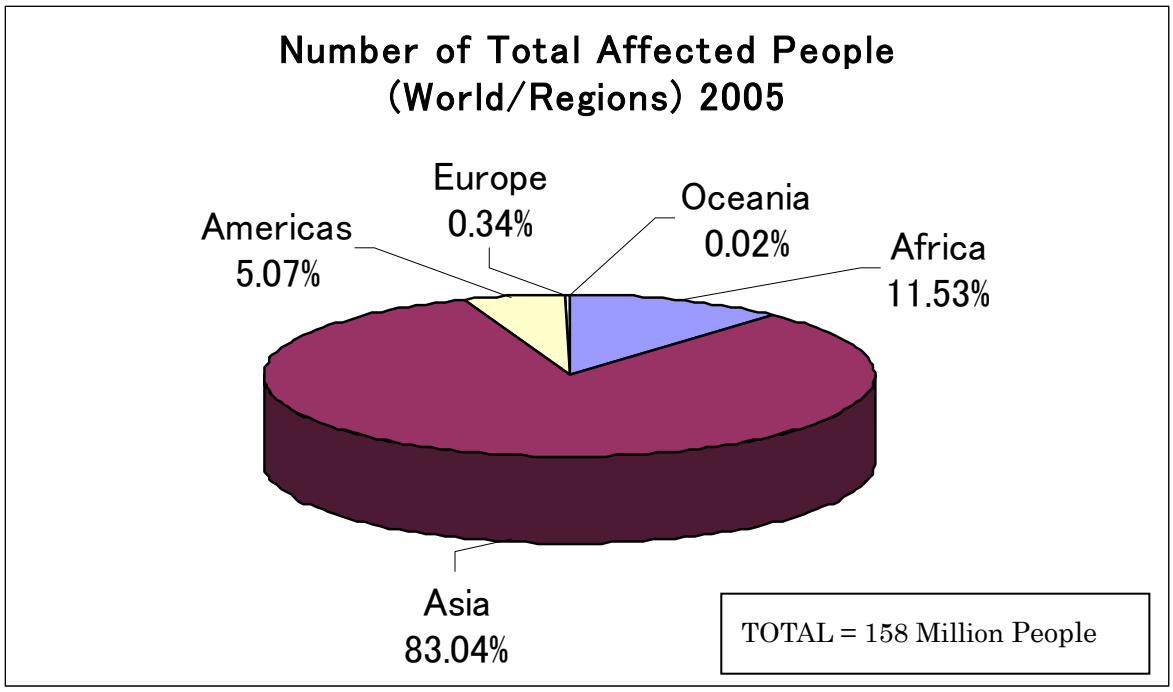
Figure 31B Proportion of People Killed Worldwide by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

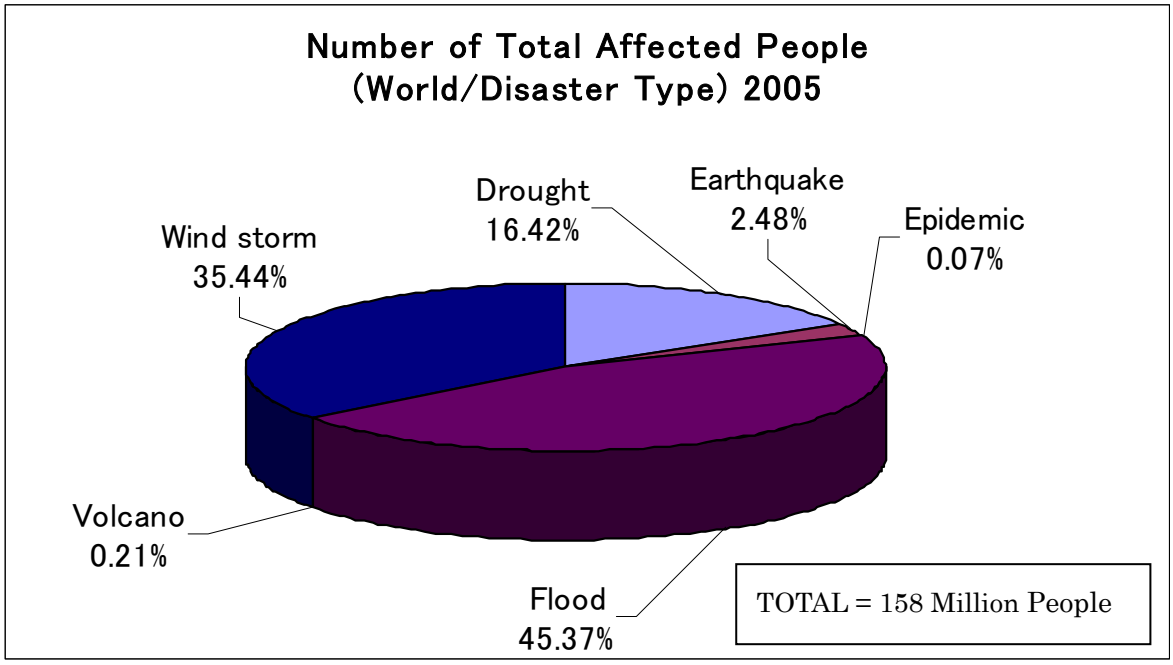
The number of total affected people increased from 145 million in 2004 to 158 million in 2005 due to the South Asian earthquake and a drought in Africa. As shown in Figure 32A, the Asian region accounted for the highest percentage of total affected people, with 83% (down 7% from the previous year). In addition to the South Asian Earthquake, which affected many people in Asia, other disasters in other parts of the world, especially Africa and the Americas, also had a significant impact. The number of total affected people in Africa and the Americas increased significantly over previous years. Nevertheless, the trend clearly reflects Asia's continued vulnerability to natural hazards. Figure 32B shows the percentages of total affected people by disaster type. Hydro-meteorological disasters, such as floods, wind storms, and droughts had a significant impact on people worldwide.

Figure 32A Proportion of Total Affected People Worldwide by Region, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

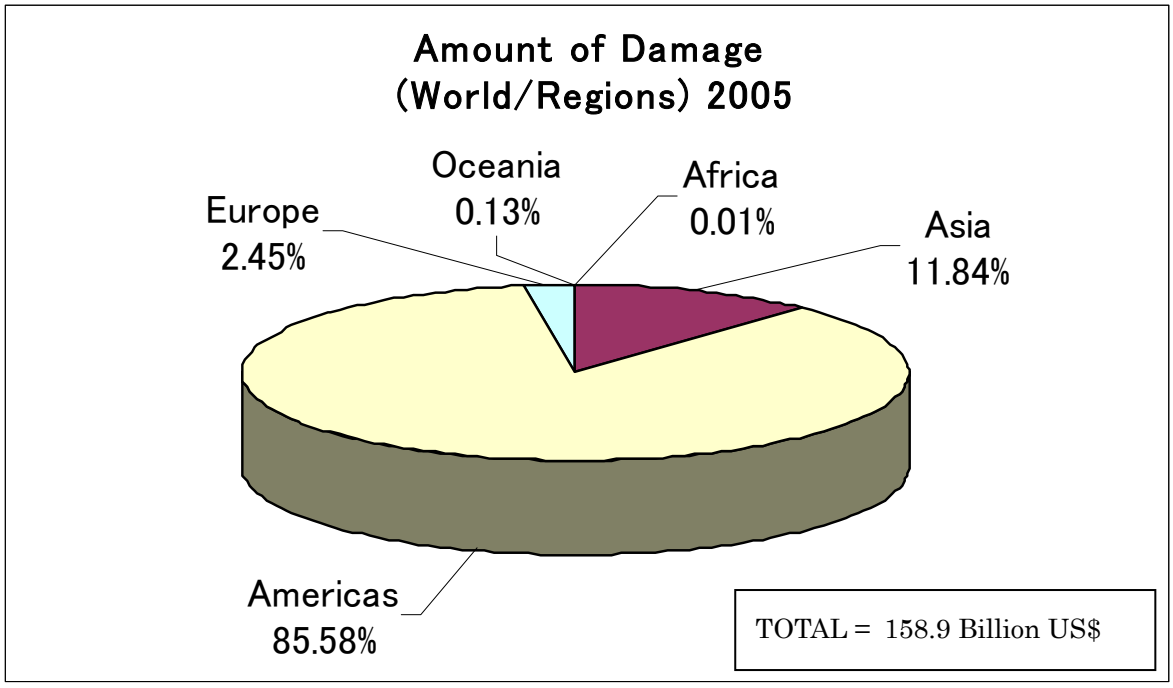
Figure 32B Proportion of Total Affected People Worldwide by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

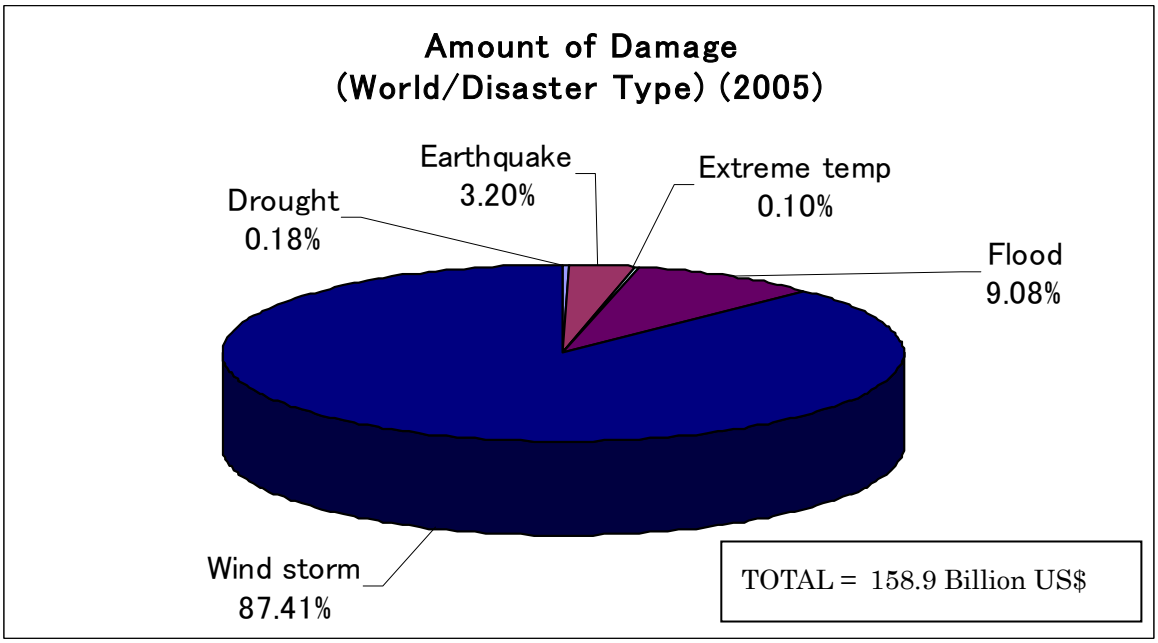
In contrast to the previous year's figures, the Americas accounted for more than two-thirds of the economic damage caused by natural disasters in 2005 (Figure 33A). This is mainly due to the impact of Hurricanes Katrina, Wilma, and others that struck the US in 2005, as well as the resulting floods. Asia accounted for less economic damage than in the previous year (12%), a tremendous decrease from 2004, the year of the devastating Indian Ocean Tsunami. The majority of damage in Asia was due to the South Asian earthquake. Europe (3%) accounted for the next highest level of economic losses, following the same patterns in 2004 in terms of damage. Figure 33B shows the amount of damage worldwide for 2005 by disaster type. Wind storms and floods were the leading causes of damage worldwide, followed by earthquakes. The socio-economic structure of these regions and the disaster occurrences and countermeasures could be attributed to these trends. All other regions accounted for much less of the economic damage sustained in 2005. Overall damage increased more than 1.5-fold over the previous year, from US$98 billion to US$159 billion, posing a huge blow to development efforts.

Figure 33A Proportion of Worldwide Damage by Region, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 33B Proportion of Worldwide Damage by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

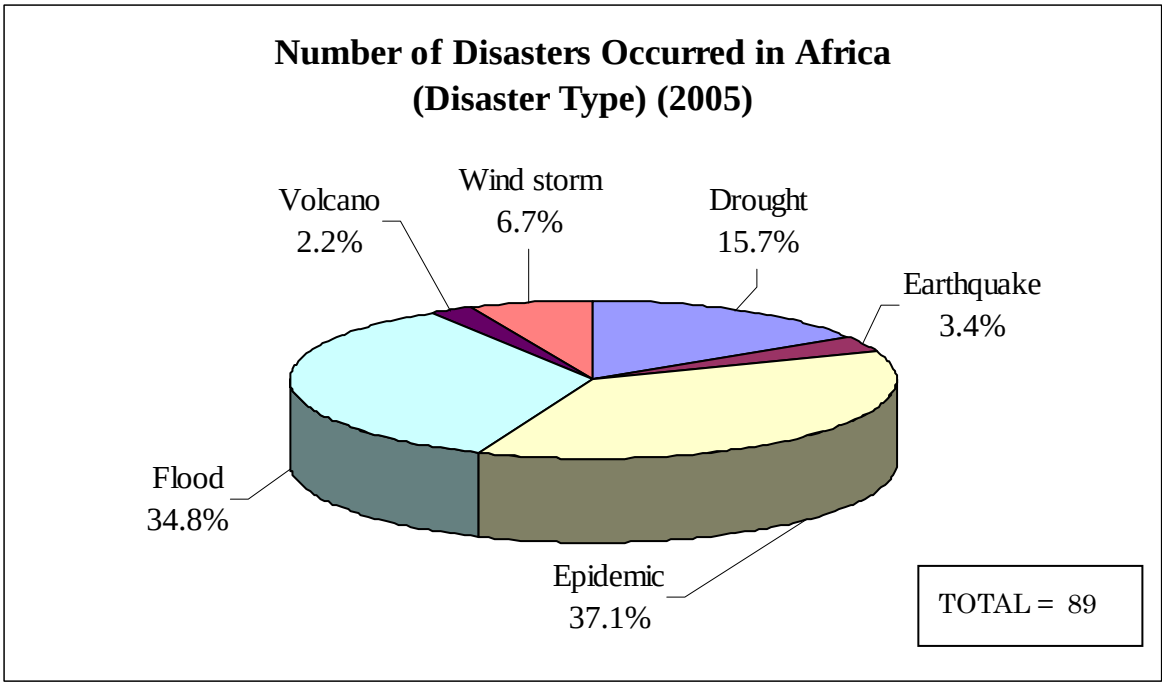
These figures indisputably demonstrate that the disaster vulnerability of the Asian region cannot be neglected in relation to global sustainable development and the need of stronger disaster countermeasures.

3.2 Natural Disasters Around the World

3.2.1 Characteristics of Disasters in Africa

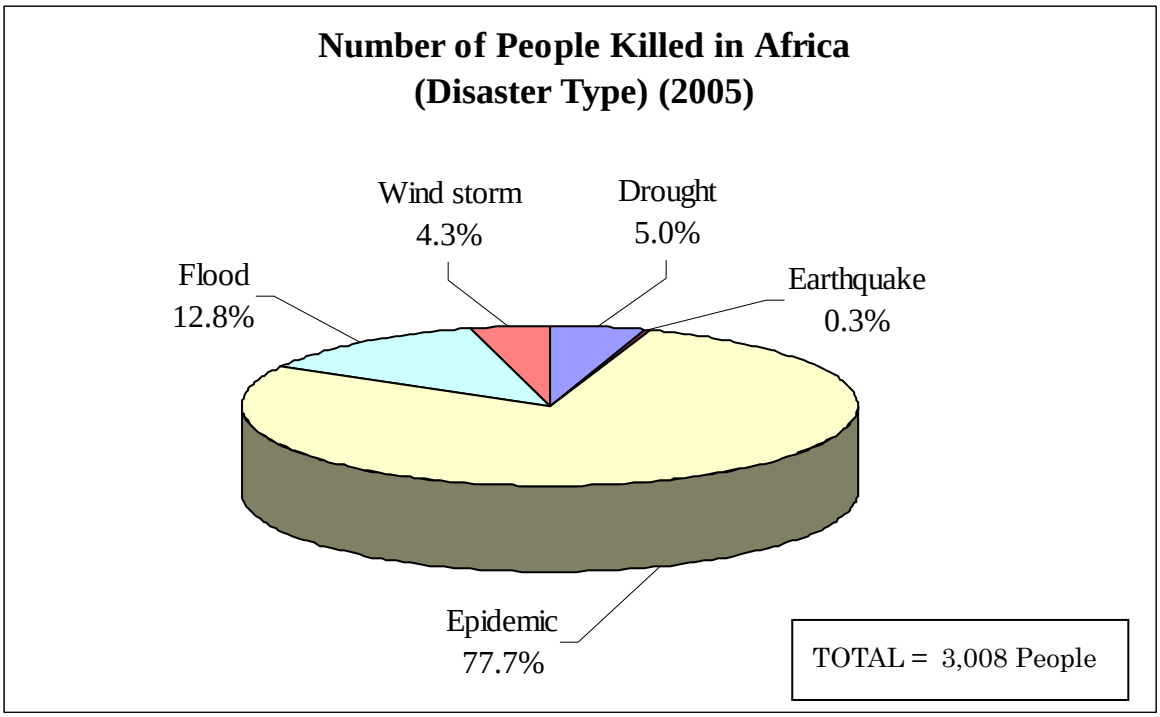
About 95% of the natural disasters that occurred in Africa in 2005 consisted of epidemics, floods, wind storms, and droughts (Figure 34). Furthermore, the majority of the human losses (99%) in Africa were due to epidemics, floods, droughts, and wind storms (Figure 35). Meanwhile, the majority of people affected by disasters in Africa were affected by droughts, which account for nearly 94% of the total affected people in Africa 2005 (Figure 36). The same pattern was seen in the previous year, when droughts accounted for almost 75% of the people affected. Droughts, volcanic eruptions, wind storms, and floods accounted for nearly 99% of the total affected population in Africa in 2005. Niger, Kenya, Malawi, Mozambique, Zambia, and Burundi were severely hit by drought. It is interesting to note, however, that all of the economic damage sustained in Africa was caused by flooding in 2005 (Figure 37). These figures show Africa to be a disaster-prone region with socio-economic vulnerabilities, where the majority of human suffering comes from droughts, floods, and epidemics.

Figure 34 Proportion of Disasters in Africa by Type, 2005



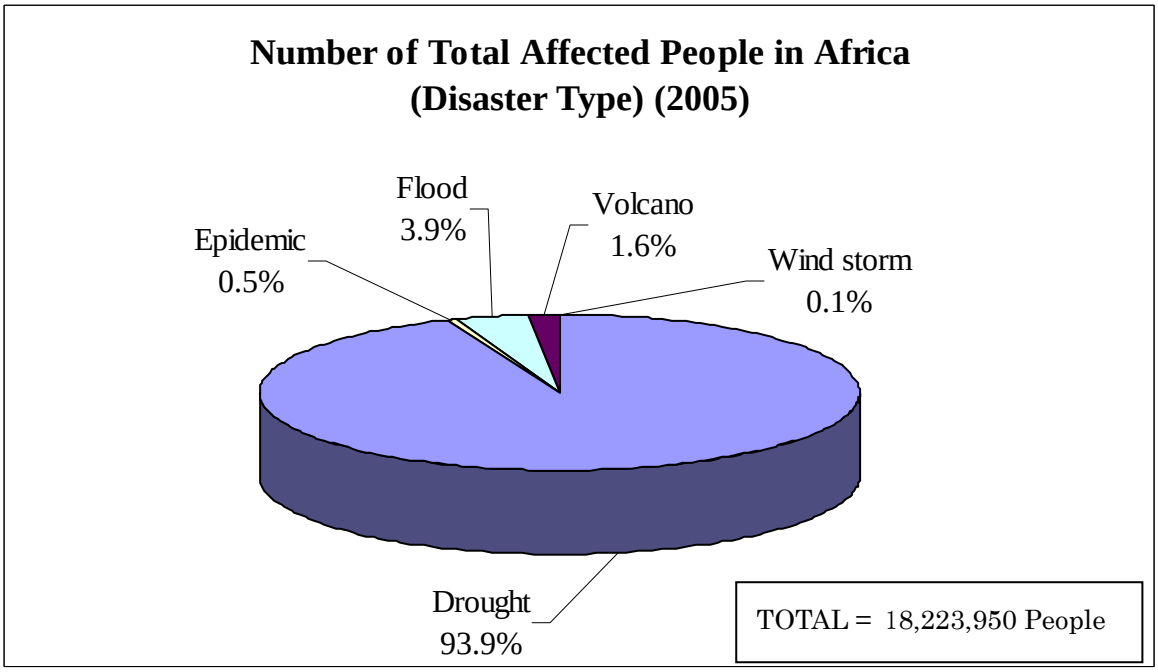
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 35 Proportion of People Killed in Africa by Disaster Type, 2005



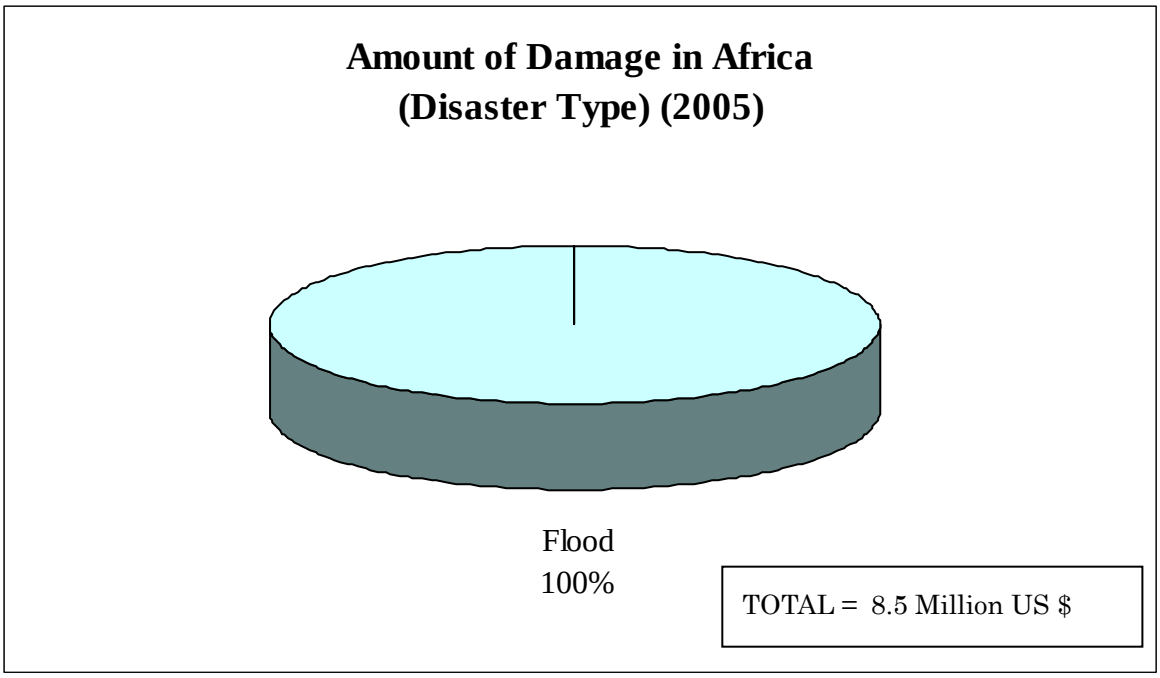
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 36 Proportion of Total Affected People in Africa by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 37 Proportion of Damage in Africa by Disaster Type, 2005

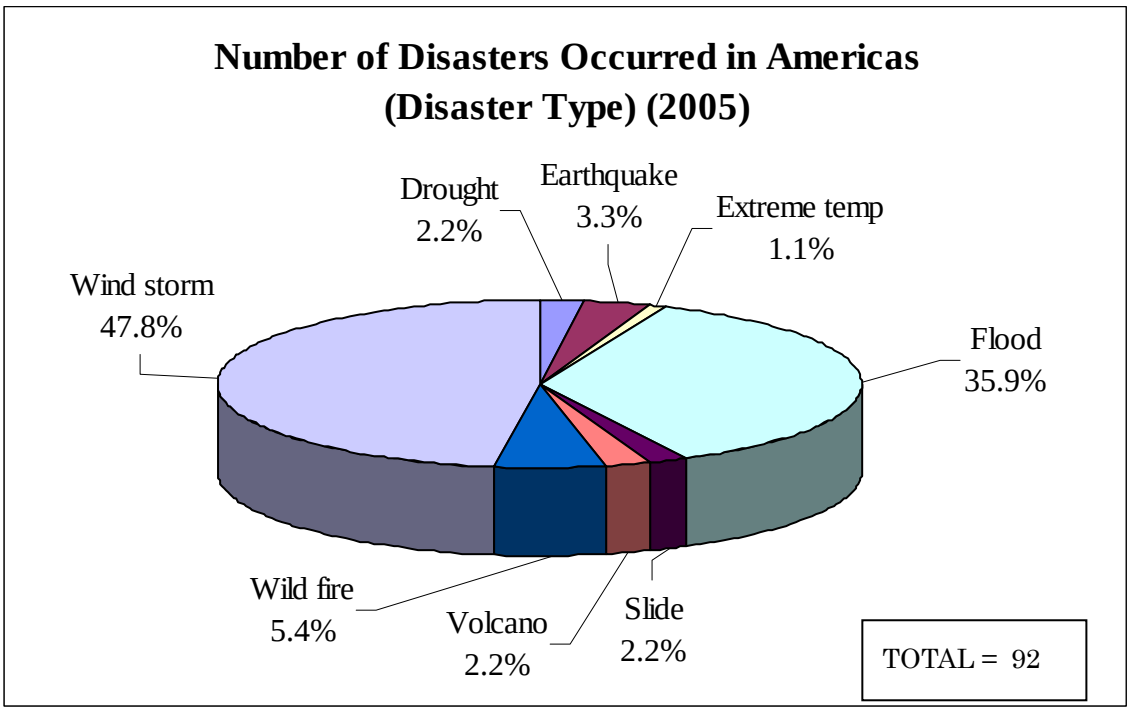


Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

3.2.2 Characteristics of Disasters in the Americas

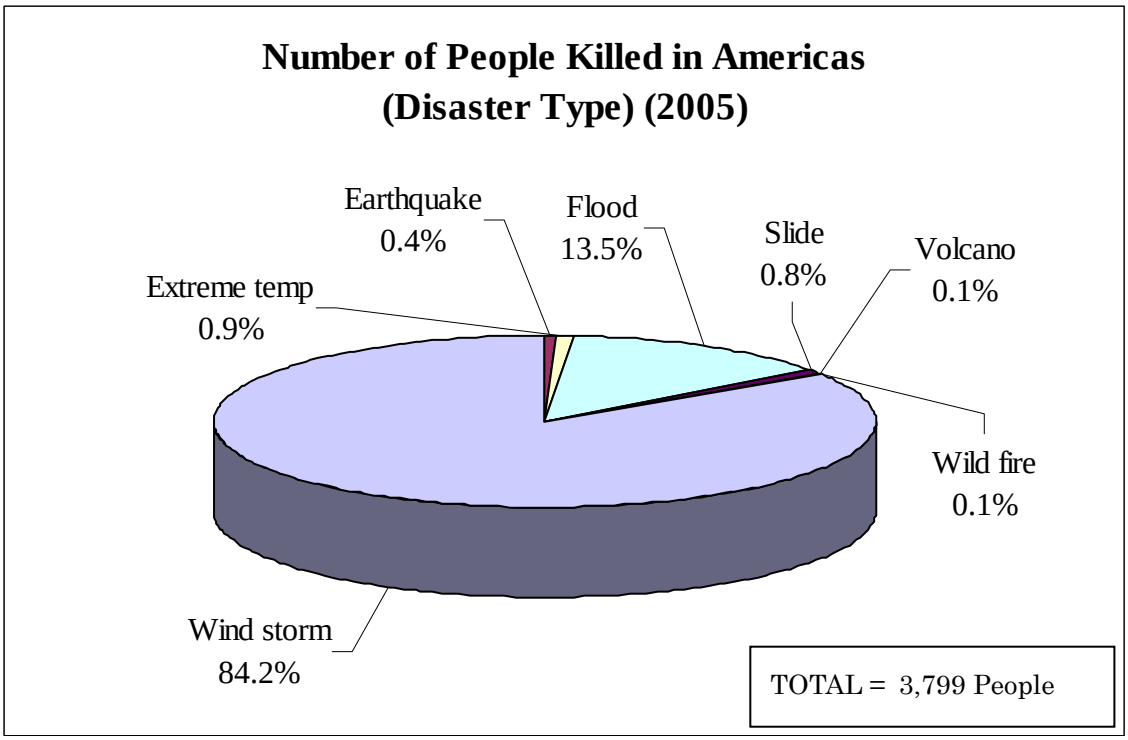
In the Americas, which includes the countries of North and South America, floods and windstorms accounted for the vast majority (almost 84%) of natural disasters that occurred in 2005. In terms of human loss and suffering, 98% of people killed were killed by floods and wind storms. Nearly 99% of the people affected were affected by wind storms and floods. The majority of the economic damage sustained was caused by wind storms (hurricanes) in 2005. Severe damage was inflicted by Hurricanes Katrina, Wilma, and others that hit the US and the Caribbean. Figures 38 to 41 show that the Americas were visited by significant hydro-meteorological disasters in 2005, as they had been in 2003 and 2004 as well.

Figure 38 Proportion of Disasters in the Americas by Type, 2005



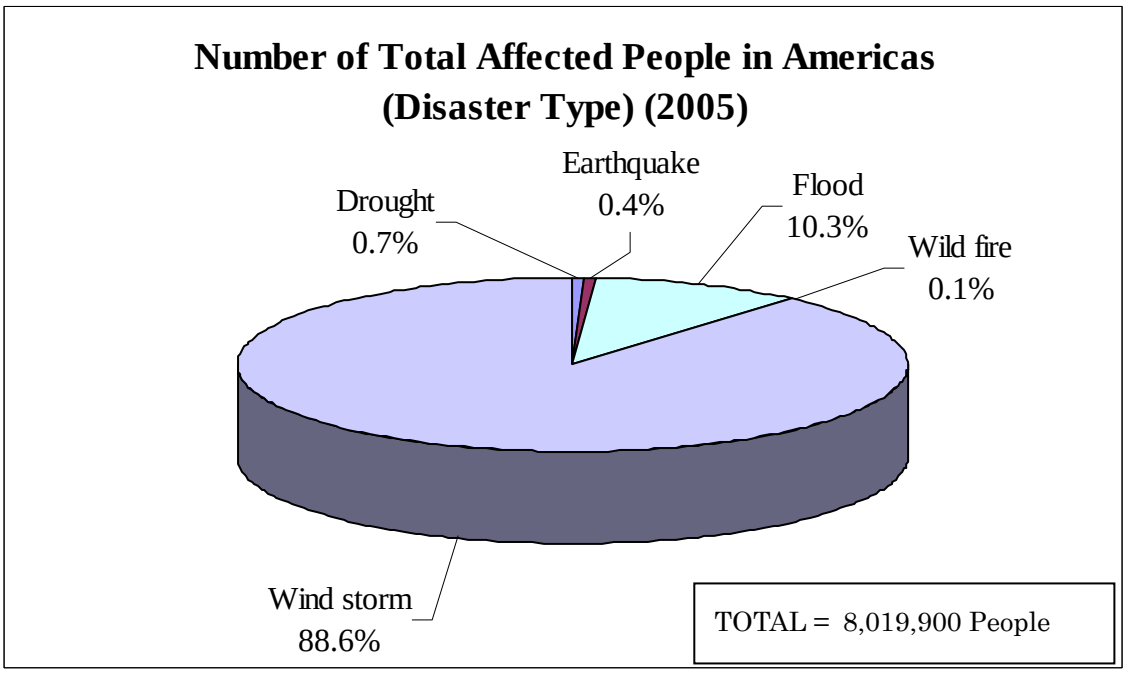
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 39 Proportion of People Killed in the Americas by Disaster Type, 2005



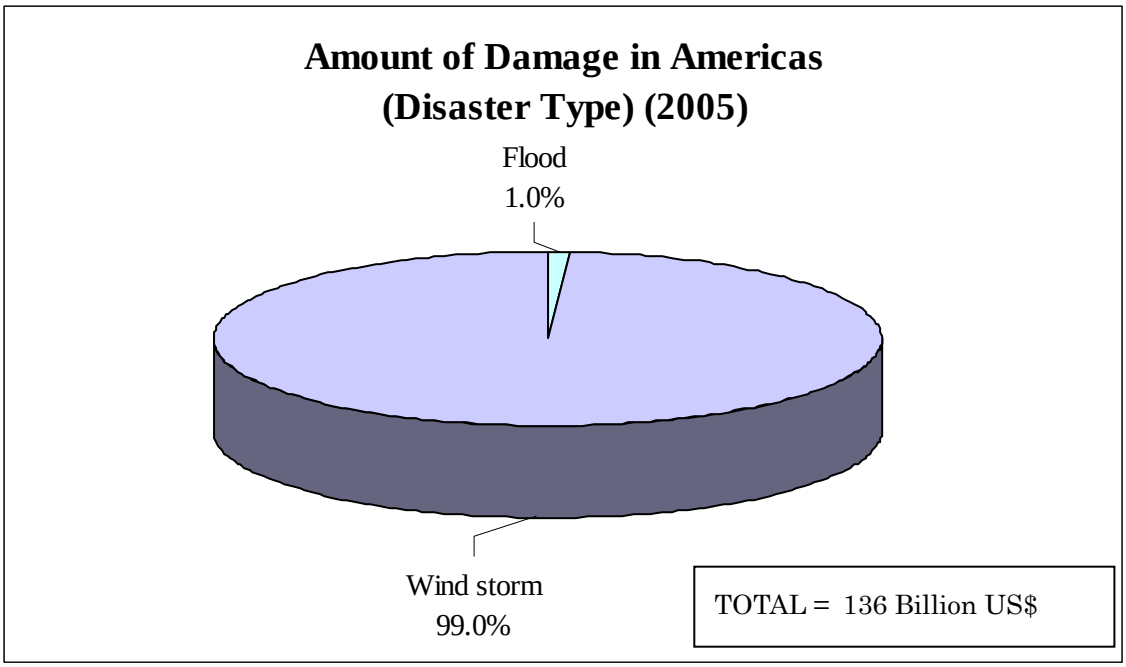
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 40 Proportion of Total Affected People in the Americas by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 41 Proportion of Damage in the Americas by Disaster Type, 2005

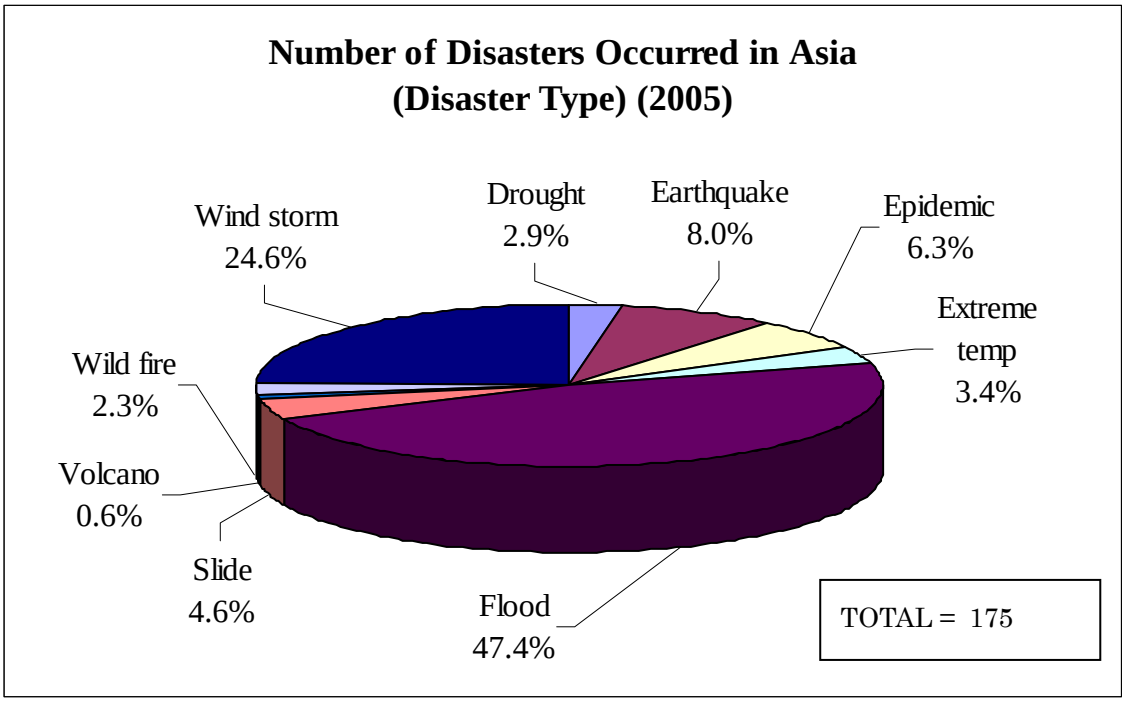


Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

3.2.3 Characteristics of Disasters in Asia

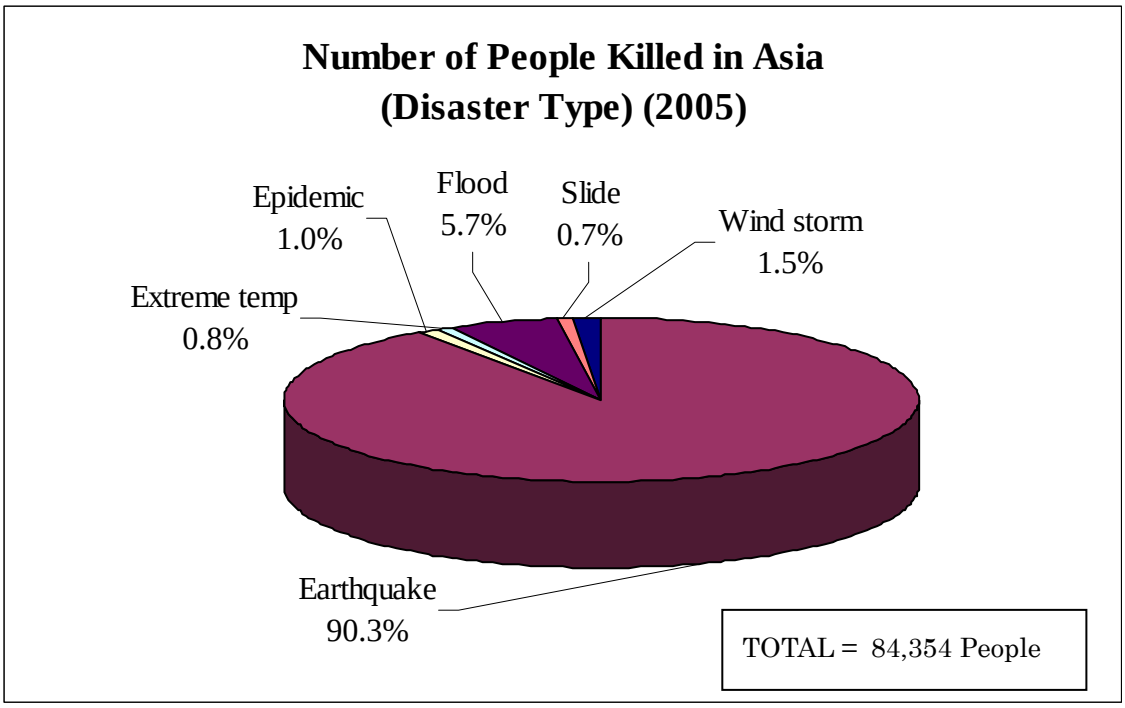
An earlier chapter demonstrated the high vulnerability of the Asian region to natural disasters. The same trend will be observed here. Floods, wind storms, earthquakes, landslides, and epidemics occurred at a greater rate than other disasters in 2005 (Figure 42). About 72% of the disasters in Asia consisted of wind storms and floods, followed by earthquakes (8%), epidemics (6%) and landslides (5%). It is worth noting that the South Asian Earthquake caused the largest number of human losses (more than 90%) in Asia, followed by floods and wind storms (Figure 43). Floods in China, India and Bangladesh also contributed to the high death toll in Asia. Figure 44 shows that floods, wind storms, droughts, and earthquakes caused severe human suffering in Asia, as these accounted for almost all the people affected by natural disasters in the region in 2005. Although the South Asian earthquake caused heavy human losses, earthquakes did not account for a large percentage of the total affected people in Asia. Furthermore, about 78% of the economic damage sustained was due to floods and earthquakes. The remainder was due to wind storms and droughts (Figure 45). Clearly, the Asian region is severely disaster-prone and vulnerable to both hydro-meteorological and geophysical disasters. The following figures highlight these trends.

Figure 42 Proportion of Disasters in Asia by Type, 2005



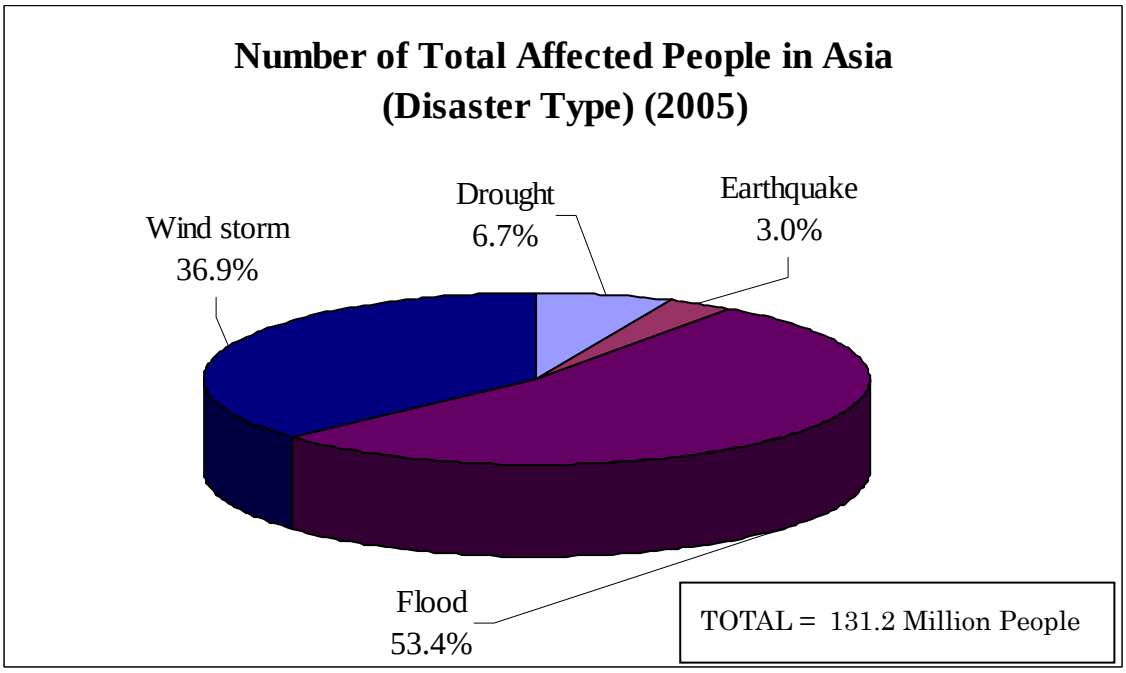
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 43 Proportion of People Killed in Asia by Disaster Type, 2005



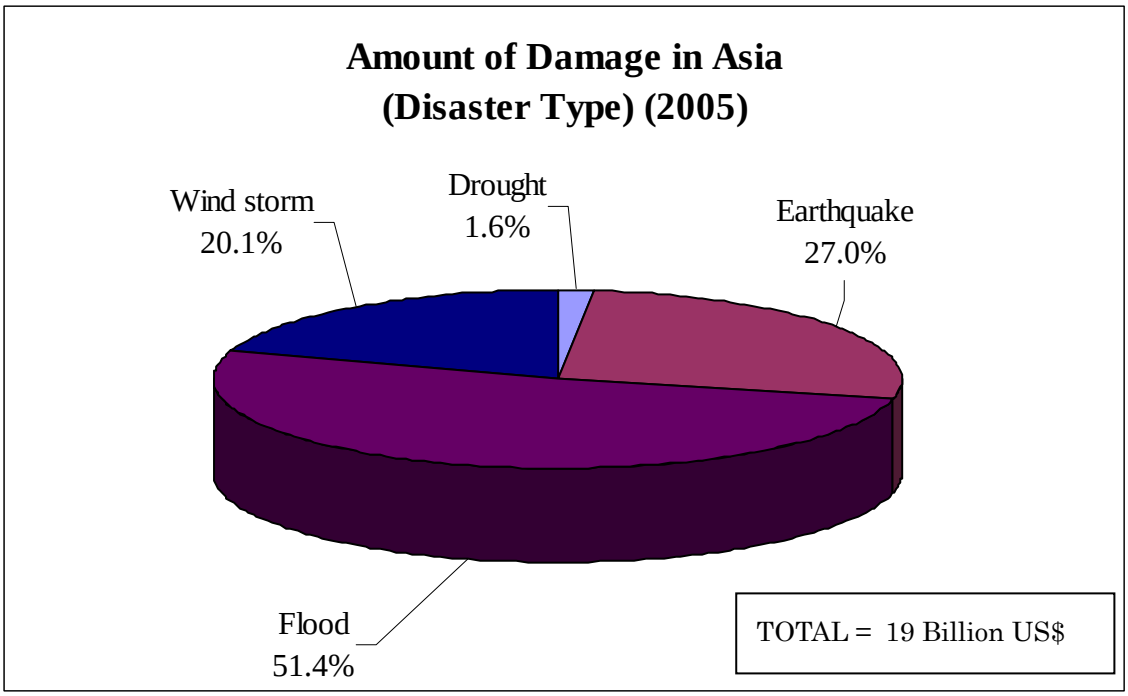
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 44 Proportion of Total Affected People in Asia by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 45 Proportion of Damage in Asia by Disaster Type, 2005

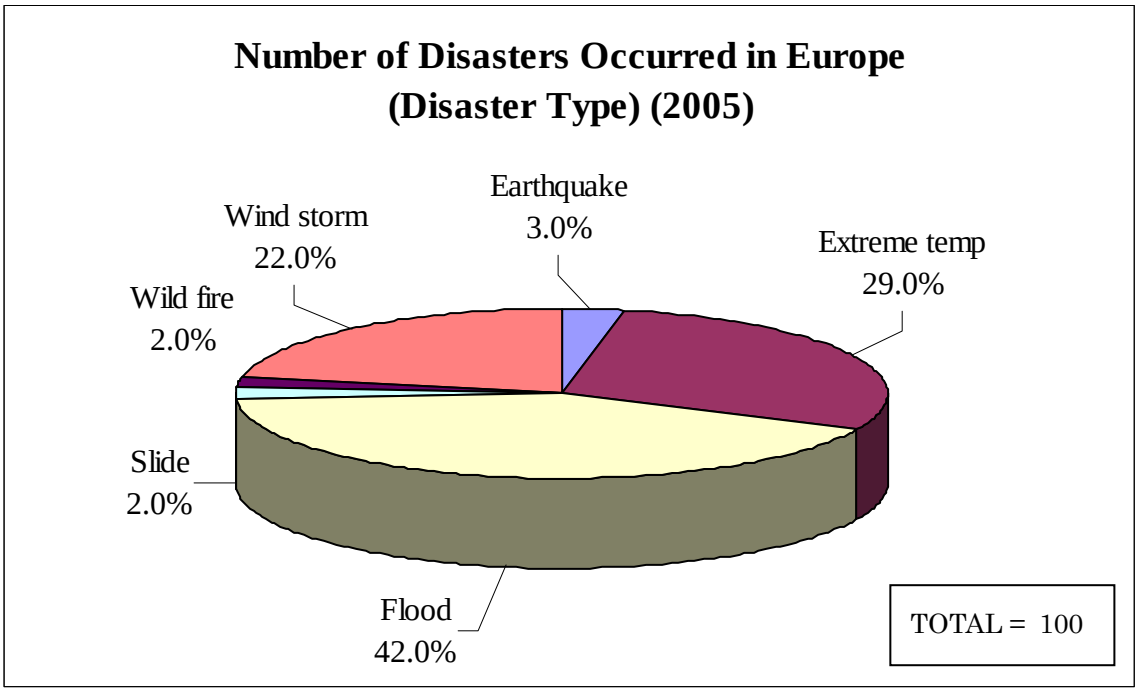


Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

3.2.4 Characteristics of Disasters in Europe

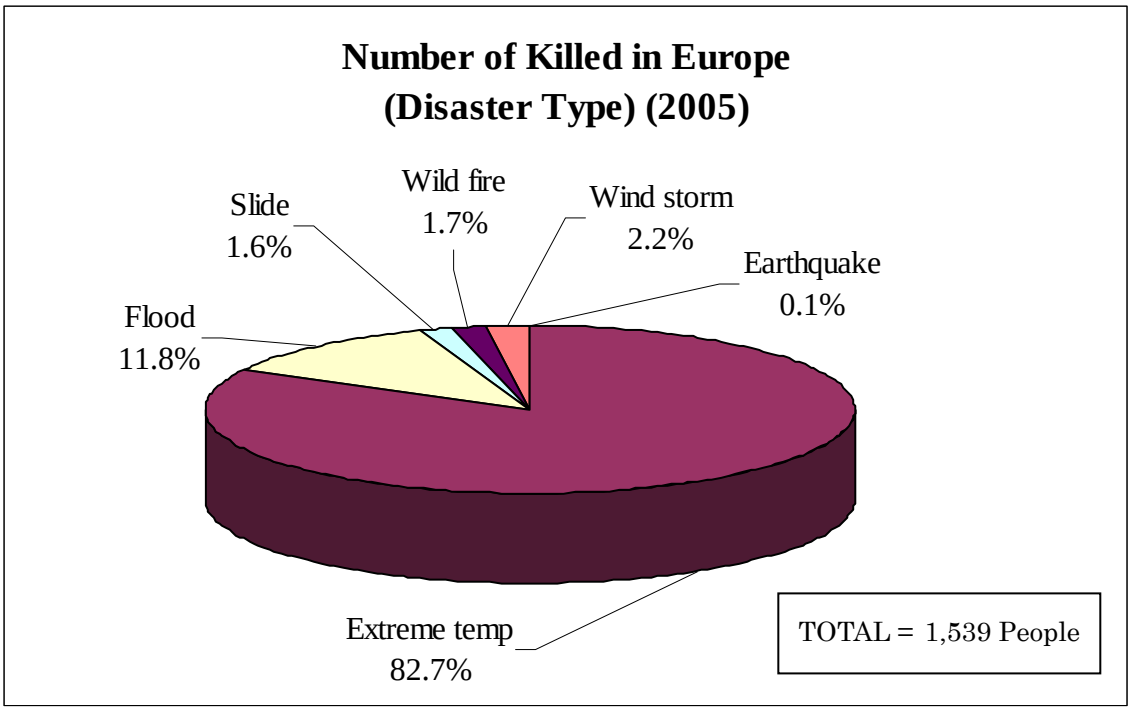
The year 2004 was not a difficult year for Europe in comparison with the extreme temperatures and heat wave of 2003, and the devastating floods of 2002. Figures 46 to 49 show that extreme temperatures (heat wave), floods, wind storms, and wild fires caused severe human losses in the region. The majority of disasters in 2005 were floods and extreme temperatures, accounting for 71% of all disasters (Figure 46). The majority of human losses were due to extreme temperatures (heat wave, 83%), followed by wind storms and floods (Figure 47). All of these disasters caused about 97% of the total human losses in the region in 2005. Furthermore, 76% of the total affected people were affected by windstorms (Figure 48), much like 2004. In 2002, as many as 84% were affected by floods, whereas in 2003, many people were affected by heat waves. Floods in Romania, Bulgaria, and Switzerland contributed significantly to the human losses and economic damage in this region in 2005. In contrast to 2004, when droughts created heavy economic losses in the region, floods caused severe economic damage in the region in 2005 (much as they had in 2003). Floods primarily in Romania and Bulgaria contributed to this trend. The year 2005 was a rather tumultuous one for Europe, which once again sustained significant damage caused by hydro-meteorological disasters.

Figure 46 Proportion of Disasters in Europe by Type, 2005



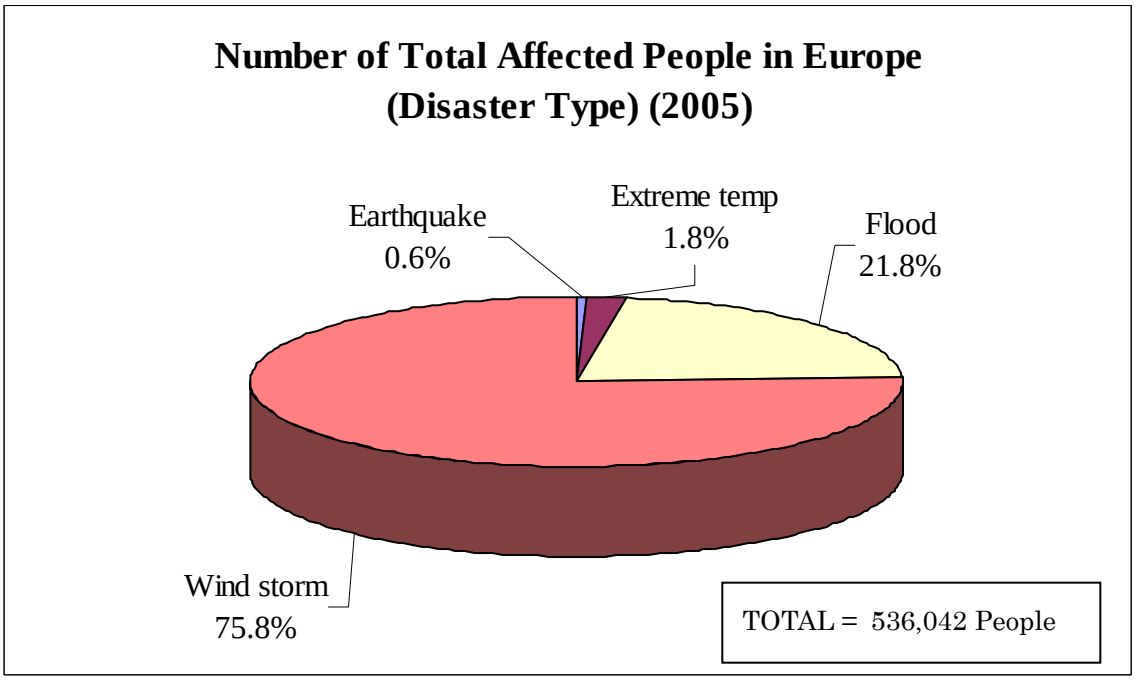
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 47 Proportion of People Killed in Europe by Disaster Type, 2005



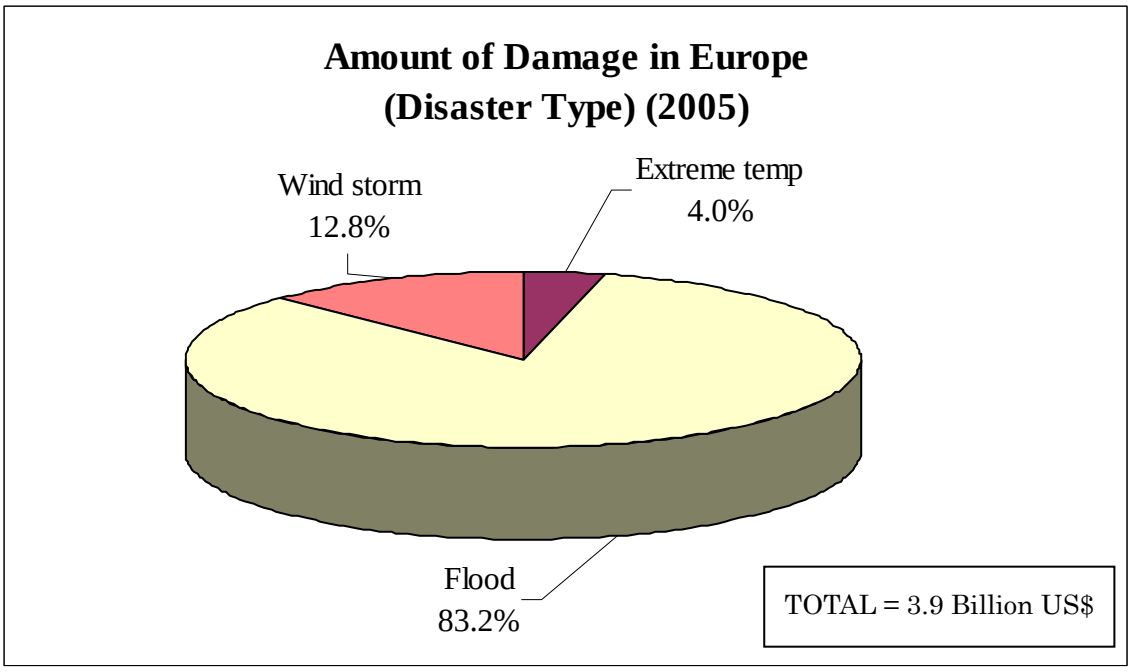
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 48 Proportion of Total Affected People in Europe by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 49 Proportion of Damage in Europe by Disaster Type, 2005



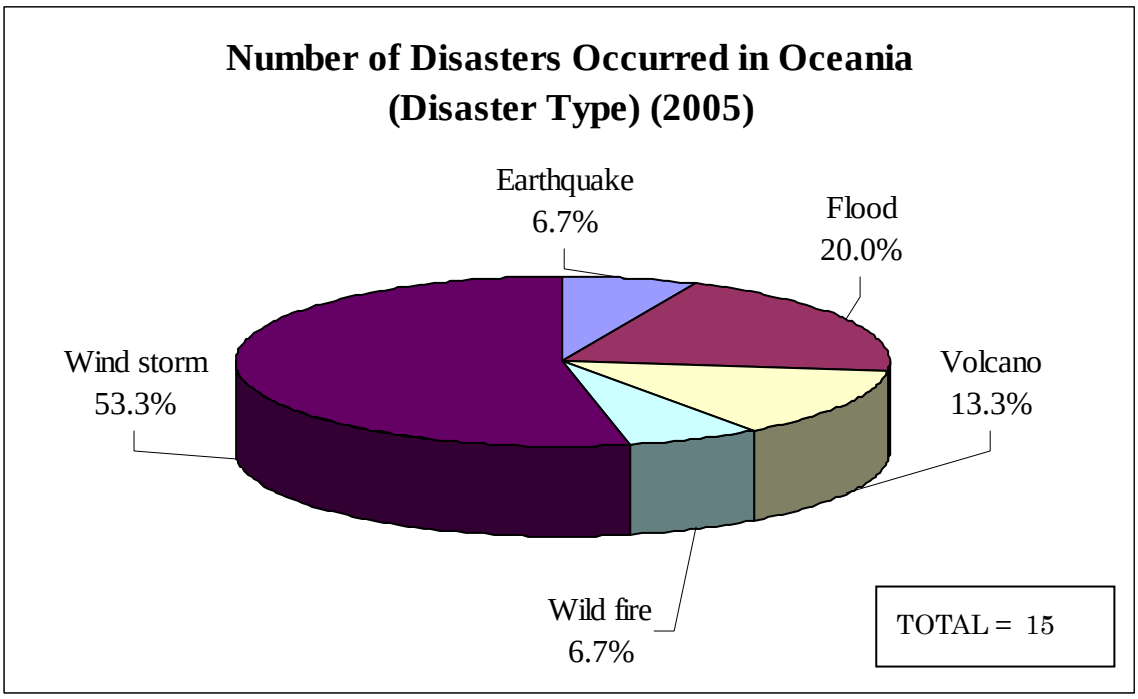
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

3.2.5 Characteristics of Disasters in Oceania

Disaster trends in Oceania were a bit different from those of other regions in 2005, as the natural disasters strayed from the average regional pattern. Not all types of natural disasters occurred here, but the majority that did occur were wind storms and floods, accounting for 73% of the total. The remainder consisted of volcanic eruptions, earthquakes, and wild fires (Figure 50). The majority of human losses were due to wild fires (52%), followed by wind storms, earthquakes, and floods (Figure 51). This was due to the wild fires in Australia and storms in the pacific island countries (Fiji, Niue, Vanuatu, Micronesia Federal States and American Samoa). The total affected people in Oceania in 2005 were largely affected by a volcanic eruption and earthquake in Papua New Guinea (71%), while the remainder were subject to floods and windstorms (Figure 52). The Papua New Guinea volcanic eruption and earthquake accounted for the majority of those affected in Oceania in 2005. This unusual picture is due to severe wind storms that hit the small pacific island countries in Oceania, the volcanic eruption and earthquake in Papua New Guinea, and wild fires in Australia. The majority of the economic damage was caused by floods (50%), wind storms (30%) and wild fires (20%), as shown in Figure 53.

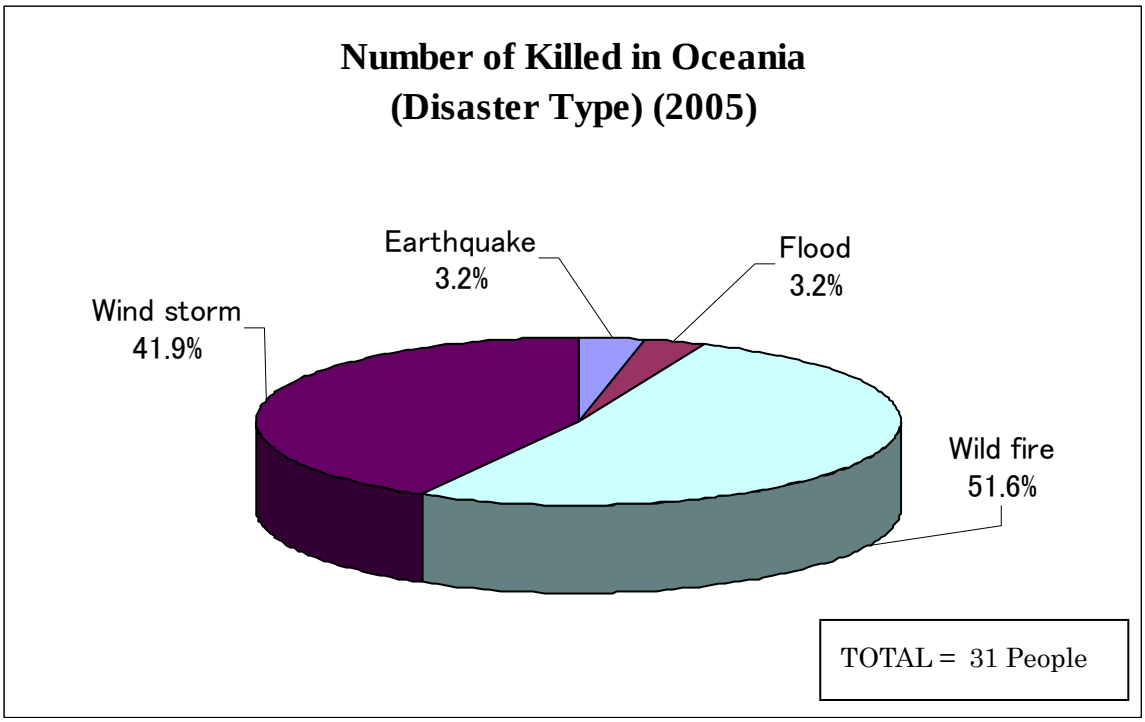
In 2005, Oceania experienced both hydro-meteorological disasters and geo physical disasters in almost equal amounts due to its geographical location.

Figure 50 Proportion of Disasters in Oceania by Type, 2005



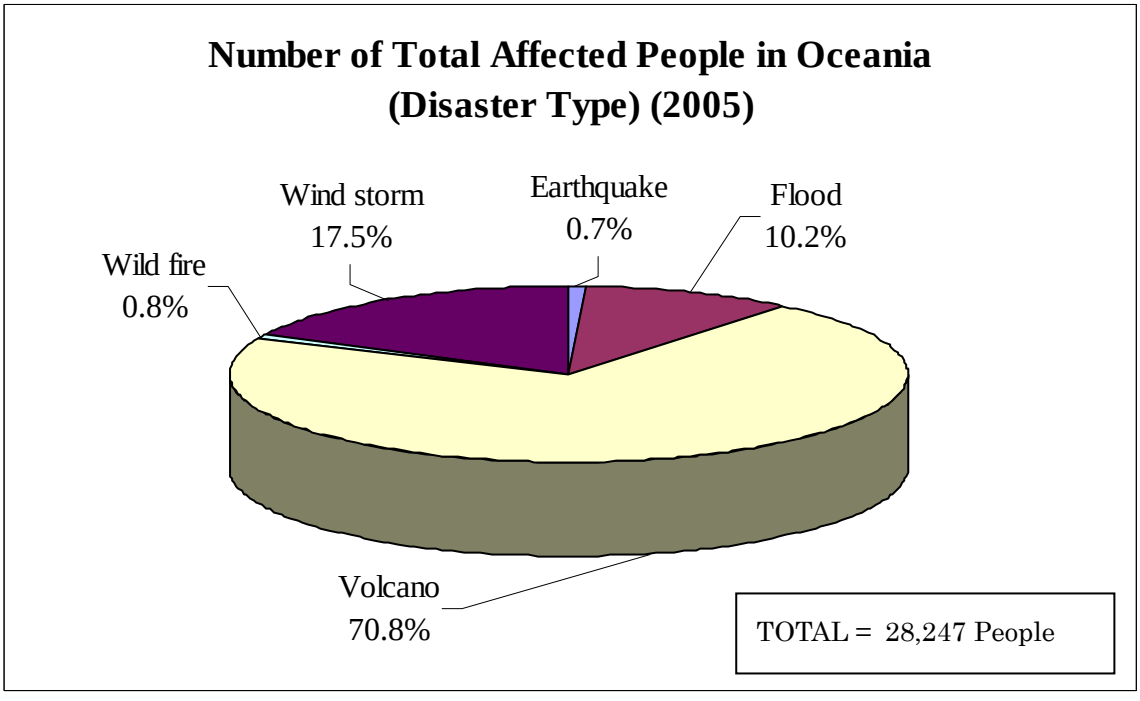
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 51 Proportion of People Killed in Oceania by Disaster Type, 2005



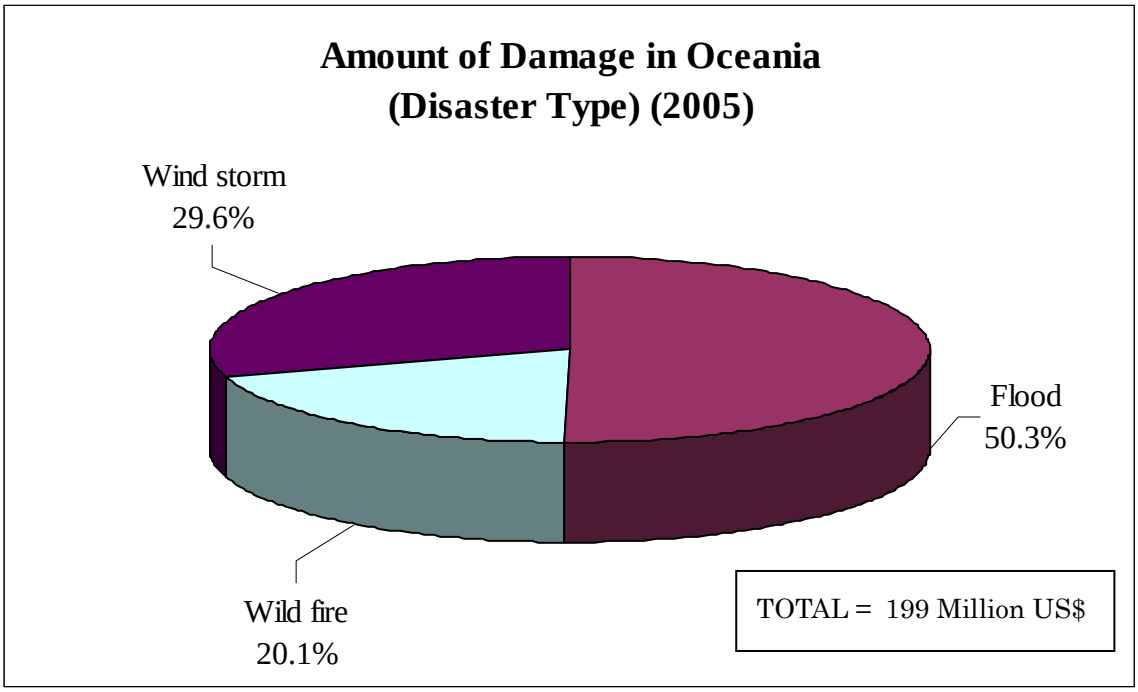
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 52 Proportion of Total Affected People in Oceania by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Figure 53 Proportion of Damage in Oceania by Disaster Type, 2005



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

This section summarizes worldwide natural disaster patterns by region. Tables 2B and 3B in Chapter 1 also provide these figures in a tabulated form. Regions all over the world, including Oceania, experienced both hydro-meteorological and geo-physical disasters in 2005. The most significant human and economic losses resulted from the South Asian earthquake that struck Pakistan and India, and the hurricanes that hit the US, respectively. The data shown here clearly demonstrates that Asia is a disaster-prone region of the world that sustains considerable levels of human losses and suffering. The most severe disasters that occurred in 2005, such as the South Asian Earthquake and the floods in India, China, and Bangladesh, occurred in the Asian region. Natural disasters deprive the affected populations of the benefits of socio-economic development, and hinder progress toward sustainable economic development - in disaster-prone regions and all over the globe.

Chapter 4: Overview of Natural Disasters in Asian and ADRC Member Countries

4.1 Types of Disasters and Their Effects on Asian and ADRC Member Countries

This section discusses the disaster patterns in Asian and ADRC member countries, using the 2005 disaster data from 21 of the ADRC's 25 member countries (excluding Armenia, Lao PDR, Mongolia, and Singapore). There are no significant 2005 disasters recorded in the CRED-EM-DAT database for the excluded countries.[4] We will also be discussing the other Asian countries that reported disasters in 2005. All the ADRC member countries are located in Asia except for Papua New Guinea (in Oceania) and Russia (in Europe). Table 16 shows the disasters that occurred in each member country, by disaster type.

China, which had one of the most disaster-affected populations in the world in 2005, was seriously affected by **drought**. Droughts also affected Cambodia and Vietnam. Droughts did not affect any other countries in Asia aside from these. This stands in contrast to 2004, when droughts only occurred in China, but appears similar to the pattern that occurred in 2003, when droughts posed problems for Indonesia, Pakistan, and Russia.

Earthquakes had a strong impact in countries like Afghanistan, China, Indonesia, India, Iran, Japan, Pakistan, and Papua New Guinea in terms of both the numbers of affected people and the economic ramifications. The South Asian earthquake that hit Pakistan and India was the world's worst disaster in 2005 in terms of human losses and economic damage. Indonesia and Iran also sustained considerable human losses and economic damage due to earthquakes. The South Asian Earthquake produced some of the highest levels of economic damage in the world and accounted for nearly 27% of the total economic damage sustained by the ADRC member countries in 2005. About 90% of the human losses sustained in Asia and the ADRC member countries were due to that quake. Earthquakes also had a considerable impact on Japan, which had just gone through the 2004 Niigata earthquake.

Epidemics occurred in Afghanistan, India, Indonesia, East Timor, China, Pakistan, and Yemen and had a significant impact in terms of total affected people. Also, a high number of people killed and total affected people were attributed to epidemics in India.

Extreme temperatures caused human losses in India, Pakistan, Bangladesh, and Russia.

The most frequent disasters in member countries are **wind storms** and **floods**. While the ADRC member countries accounted for more than 80% of the total human losses in 2003, they accounted for only 2% of the human losses in 2004. In 2005, however, this increased to about 7%, the majority of which were due to wind storms and floods. Furthermore, floods and wind storms accounted for about 90% of the affected population in Asian and ADRC member countries in 2005, in contrast to 2004 when that figure was only 21%. The data also shows that nearly 71% of the total economic losses in member countries were due to floods and wind storms. The most severe damage in terms of human suffering and economic losses

occurred in member countries China, India, Bangladesh, Pakistan, Sri Lanka, Philippines, Thailand, and Vietnam, though most member countries had some disaster impact. **Landslides** caused considerable human suffering in India and Tajikistan.

Volcanic eruptions occurred in Indonesia and Papua New Guinea, causing extensive human suffering in terms of the total affected population. It is noteworthy to mention that these disasters did not result in the loss of any human lives. **Wild fires** also caused human suffering in Korea.

Table 16: Natural Disasters in Asia and the ADRC Member Countries by Disaster Type (2005)

Disaster Type	Country	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
Drought	Cambodia	1		600,000	
	China, P Rep	2		7,774,000	
	Thailand	1		0	250,000
	Viet Nam	1		410,000	42,120
Drought Total		**5**		**8,784,000**	**292,120**
Earthquake	Afghanistan	2	6	501	
	China, P Rep	2	16	634,009	
	India	1	1,309	156,622	
	Indonesia	2	916	105,997	
	Iran, Islam Rep	4	625	116,888	80,000
	Japan	2	1	4,430	
	Pakistan	1	73,338	2,869,142	5,000,000
	Papua New Guinea	1	1	200	
Earthquake Total		**15**	**76,212**	**3,887,789**	**5,080,000**
Epidemic	Afghanistan	1		3,245	
	China, P Rep	1	38	168	
	East Timor	1	22	336	
	India	4	706	2,489	
	Indonesia	1		329	
	Pakistan	2	42	111	
	Yemen	1		179	
Epidemic Total		**11**	**808**	**6,857**	

[4] See Note 1 on page ii.

Disaster Type	Country	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
Extreme temp	Bangladesh	2	100	1,000	
	China, P Rep	1		200	
	India	2	509		
	Pakistan	1	106	200	
	Russia	1	84		
Extreme temp Total		**7**	**799**	**1,400**	
Flood	Afghanistan	9	195	18,315	
	Bangladesh	3	55	1,150,000	
	Cambodia	1	16		
	China, P Rep	11	1,106	35,048,995	3,672,050
	Georgia	1		2,500	
	Hong Kong (China)	1			
	India	17	1,850	25,479,012	5,823,000
	Indonesia	3	154	20,790	
	Iran, Islam Rep	4	109	4,750	
	Japan	1		900	
	Kazakhstan	1		25,000	7,662
	Korea Dem P Rep	1	193	16,298	
	Korea, Rep	1	18	1,500	
	Kyrgyzstan	1	3	2,050	2,660
	Malaysia	2	13	30,600	
	Nepal	2	51	31,600	
	Pakistan	5	624	7,527,023	
	Papua New Guinea	1	1	2,493	
	Philippines	2	5	193,046	515
	Russia	5	22	9,045	23,668
	Saudi Arabia	2	63	67	
	Sri Lanka	1	6	145,000	
	Taiwan (China)	1	16	2,700	62,000
	Tajikistan	2	8	5,112	50,000
	Thailand	2	76	251,526	14,900
	Uzbekistan	1		1,500	
	Viet Nam	5	184	101,893	34,000

Disaster Type	Country	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
	Yemen	2	22	721	
Flood Total		**88**	**4,790**	**70,072,436**	**9,690,455**
Slide	India	2	262	5,020	
	Indonesia	2	211	10	
	Myanmar	1	17	16	
	Pakistan	1	25		
	Russia	1	9		
	Tajikistan	1	16	1,953	
	Yemen	1	65	11	
Slide Total		**9**	**605**	**7,010**	
Volcano	Indonesia	1		26,000	
	Papua New Guinea	1		15,000	
Volcano Total		**2**		**41,000**	
Wild fire	Indonesia	1			
	Korea, Rep	1		2,140	
	Malaysia	1			
	Thailand	1			
Wild fire Total		**4**		**2,140**	
Wind storm	Afghanistan	1	260	22,656	
	Bangladesh	7	164	35,206	
	China, P Rep	14	426	47,702,823	3,480,915
	India	4	82	68,590	
	Iran, Islam Rep	1		8,000	
	Japan	3	130	304,043	36,900
	Korea, Rep	1	5	1,100	
	Pakistan	1	58		
	Philippines	2	18	11	
	Russia	2		2	
	Taiwan (China)	3	13	339	40,000
	Thailand	2	10	3,500	246
	Viet Nam	4	88	344,160	219,250
Wind storm Total		**45**	**1,254**	**48,490,430**	**3,777,311**
Grand Total		**186**	**84,468**	**131,293,062**	**18,839,886**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

4.2 Disaster Profiles of the Asian and ADRC Member Countries

Table 17: Natural Disasters in Asia and the ADRC Member Countries by Country (2005)

Country	Disaster Type	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
Afghanistan	Earthquake	2	6	501	
	Epidemic	1		3,245	
	Flood	9	195	18,315	
	Wind storm	1	260	22,656	
Afghanistan Total		**13**	**461**	**44,717**	
Bangladesh	Extreme temp	2	100	1,000	
	Flood	3	55	1,150,000	
	Wind storm	7	164	35,206	
Bangladesh Total		**12**	**319**	**1,186,206**	
Cambodia	Drought	1		600,000	
	Flood	1	16		
Cambodia Total		**2**	**16**	**600,000**	
China, P Rep	Drought	2		7,774,000	
	Earthquake	2	16	634,009	
	Epidemic	1	38	168	
	Extreme temp	1		200	
	Flood	11	1,106	35,048,995	3,672,050
	Wind storm	14	426	47,702,823	3,480,915
China, P Rep Total		**31**	**1,586**	**91,160,195**	**7,152,965**
East Timor	Epidemic	1	22	336	
East Timor Total		**1**	**22**	**336**	
Georgia	Flood	1		2,500	
Georgia Total		**1**		**2,500**	
Hong Kong (China)	Flood	1			
Hong Kong (China) Total		**1**			
India	Earthquake	1	1,309	156,622	
	Epidemic	4	706	2,489	
	Extreme temp	2	509		
	Flood	17	1,850	25,479,012	5,823,000
	Slide	2	262	5,020	

Country	Disaster Type	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
	Wind storm	4	82	68,590	
India Total		**30**	**4,718**	**25,711,733**	**5,823,000**
Indonesia	Earthquake	2	916	105,997	
	Epidemic	1		329	
	Flood	3	154	20,790	
	Slide	2	211	10	
	Volcano	1		26,000	
	Wild fire	1			
Indonesia Total		**10**	**1,281**	**153,126**	
Iran, Islam Rep	Earthquake	4	625	116,888	80,000
	Flood	4	109	4,750	
	Wind storm	1		8,000	
Iran, Islam Rep Total		**9**	**734**	**129,638**	**80,000**
Japan	Earthquake	2	1	4,430	
	Flood	1		900	
	Wind storm	3	130	304,043	36,900
Japan Total		**6**	**131**	**309,373**	**36,900**
Kazakhstan	Flood	1		25,000	7,662
Kazakhstan Total		**1**		**25,000**	**7,662**
Korea Dem P Rep	Flood	1	193	16,298	
Korea Dem P Rep Total		**1**	**193**	**16,298**	
Korea, Rep	Flood	1	18	1,500	
	Wild fire	1		2,140	
	Wind storm	1	5	1,100	
Korea, Rep Total		**3**	**23**	**4,740**	
Kyrgyzstan	Flood	1	3	2,050	2,660
Kyrgyzstan Total		**1**	**3**	**2,050**	**2,660**
Malaysia	Flood	2	13	30,600	
	Wild fire	1			
Malaysia Total		**3**	**13**	**30,600**	
Myanmar	Slide	1	17	16	
Myanmar Total		**1**	**17**	**16**	
Nepal	Flood	2	51	31,600	
Nepal Total		**2**	**51**	**31,600**	

Country	Disaster Type	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
Pakistan	Earthquake	1	73,338	2,869,142	5,000,000
	Epidemic	2	42	111	
	Extreme temp	1	106	200	
	Flood	5	624	7,527,023	
	Slide	1	25		
	Wind storm	1	58		
Pakistan Total		**11**	**74,193**	**10,396,476**	**5,000,000**
Papua New Guinea	Earthquake	1	1	200	
	Flood	1	1	2,493	
	Volcano	1		15,000	
Papua New Guinea Total		**3**	**2**	**17,693**	
Philippines	Flood	2	5	193,046	515
	Wind storm	2	18	11	
Philippines Total		**4**	**23**	**193,057**	**515**
Russia	Extreme temp	1	84		
	Flood	5	22	9,045	23,668
	Slide	1	9		
	Wind storm	2		2	
Russia Total		**9**	**115**	**9,047**	**23,668**
Saudi Arabia	Flood	2	63	67	
Saudi Arabia Total		**2**	**63**	**67**	
Sri Lanka	Flood	1	6	145,000	
Sri Lanka Total		**1**	**6**	**145,000**	
Taiwan (China)	Flood	1	16	2,700	62,000
	Wind storm	3	13	339	40,000
Taiwan (China) Total		**4**	**29**	**3,039**	**102,000**
Tajikistan	Flood	2	8	5,112	50,000
	Slide	1	16	1,953	
Tajikistan Total		**3**	**24**	**7,065**	**50,000**
Thailand	Drought	1			250,000
	Flood	2	76	251,526	14,900
	Wild fire	1			
	Wind storm	2	10	3,500	246
Thailand Total		**6**	**86**	**255,026**	**265,146**

Country	Disaster Type	Number of Disasters	Sum of Killed	Sum of Totally Affected	Sum of Damage US$ ('000s)
Uzbekistan	Flood	1		1,500	
Uzbekistan Total		**1**		**1,500**	
Viet Nam	Drought	1		410,000	42,120
	Flood	5	184	101,893	34,000
	Wind storm	4	88	344,160	219,250
Viet Nam Total		**10**	**272**	**856,053**	**295,370**
Yemen	Epidemic	1		179	
	Flood	2	22	721	
	Slide	1	65	11	
Yemen Total		**4**	**87**	**911**	
Grand Total		**186**	**84,468**	**131,293,062**	**18,839,886**

Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2005

Table 16 shows the effects of the various types of natural disasters that occurred in the affected countries, and Table 17 shows the types of natural disasters that occurred by country.

In **Afghanistan,** wind storms and floods resulted in considerable human suffering. Earthquakes and epidemics also had a moderate impact.

In **Bangladesh**, floods, and wind storms caused considerable human suffering and loss of life. As in 2004, the most destructive disaster type in 2005 was floods. Bangladesh lies along the path of cyclones generated in the Bay of Bengal, making the country particularly prone to hydro-meteorological disasters.

Cambodia recorded heavy human suffering due to drought, though no loss of life was reported. Floods affected Cambodia and loss of life was reported.

China experienced almost every type of disaster, as the country encompasses a vast area with a large population. The most severe disasters in China in 2005 were floods and wind storms, followed by droughts. Earthquakes also had a considerable impact on the population. Floods and wind storms proved to be the largest natural disasters in China in 2005, in terms of the affected population and economic damage.

Epidemics were reported **East Timor** in 2005, though their impact was minor. **Georgia** reported floods, which caused moderate human suffering.

Although 2004 did not bring many disasters for **India,** floods and the tsunami affected more than 33 million people. The Indian Ocean Tsunami was the most destructive disaster in 2004, but 2005 brought even more trouble, with heavy floods and wind storms affecting many parts of the country. The most devastating disaster in 2005, the South Asian Earthquake, has had a tremendous impact on India. These disasters caused almost US$6 billion damage in India and severely disrupted everyday life. Located in a natural disaster-prone area, India is vulnerable to wind storms spawned in the Bay of Bengal and the Arabian Sea, earthquakes caused by active crustal movement in the Himalayan Mountains, floods brought

by monsoons, and droughts in the country's arid and semi-arid areas. India has also become much more vulnerable to tsunamis in the Indian Ocean since the 2004 Indian Ocean Tsunami struck the coastal areas of Andaman and the Nicobar Islands.

Tsunamis, earthquakes, floods, wind storms, volcanic eruptions, and epidemics were the disasters that most affected **Indonesia** in the year 2004. The year 2005 brought more disasters, including earthquakes, volcanic eruptions, and floods. With seismic belts running throughout the country, Indonesia is prone to earthquakes. It has 129 active volcanoes and experiences volcanic eruptions on a regular basis. The year 2005 was no exception in terms of the occurrence of disasters related to volcanic activity. Moreover, floods tend to occur along with wind storms during the country's rainy season.

The year 2005, like 2004, was devastating for **Iran**, which experienced earthquakes, floods, and wind storms. In 2003, the historic Bam Earthquake destroyed almost the entire historical town of Bam and accounted for the highest number of human lives claimed in a single disaster that year. The year 2005 was better than 2003 or 2004, however, even though earthquakes, floods and wind storms had a considerable impact.

In **Japan,** 2005 was not as bad a year as 2004 in terms of damage and human suffering. The 2004 earthquake in Niigata caused about US$28 billion in damage and affected more than 62,000 people. This was the highest amount of damage caused by a single disaster in Japan in 2004. Floods and wind storms also had a considerable effect on the population, affecting 350,000 people and causing damage of more than US$18 billion. Some major wind storms and floods also had a considerable impact on the population in Japan in 2005. The damage caused by disasters was comparatively low in 2005 versus previous years. Since Japan's geographical position makes it highly prone to earthquakes, wind storms, floods, landslides, and tsunamis, it has some of the best disaster management systems and countermeasures in the world. These have proven to be highly effective in reducing human losses and suffering.

Flood affected more than 25,000 people in **Kazakhstan** in 2005.

Most of the natural disasters that occur in **Korea** consist of floods in the rainy season, as well as wind storms. In 2005 there were also wild fires, floods, and wind storms. Human suffering and economic losses were not quite as high in 2005 as in 2004, when typhoons caused damage of more than US$500 million.

Almost 90% of **Kyrgyzstan** is covered with mountains that are more than 1,000 meters above sea level, and about 40% of those mountains are situated in alpine areas over 3,000 meters in elevation. The distinctive natural disasters of Kyrgyzstan are earthquakes accompanied by active crustal deformations, and floods caused by snowmelt and landslides. As in previous years, Kyrgyzstan reported flood disasters that caused moderate human suffering in 2005.

Malaysia often experiences floods and landslides caused by rainfall during the monsoon season, and rainstorms triggered by tropical low pressure systems. In 2005, the country experienced floods and wild fires. These produced little loss of life and economic damage, in spite of causing high numbers of affected population.

Though landslide disasters affected **Myanmar** in 2005, there were human losses associated with them.

Nepal is located in the Himalayan region where the Indian plate is subsiding under the Eurasia plate. This crustal formation causes frequent earthquakes. Moreover, floods, landslides, and extreme temperatures often pose a threat to Nepal. Table 17 shows that Nepal suffered significant flooding in 2004, which caused heavy human losses and high numbers of total affected population (which includes the numbers of homeless, injured ,and affected persons).

Pakistan is often hit by droughts, extreme temperatures, floods, landslides, earthquakes, and wind storms. In the year 2005, the South Asian earthquake caused significant human suffering, with more than 73,000 dead and about three million people affected. This disaster produced the highest death toll in the world in 2005. Pakistan also experienced floods that had a significant impact on the population.

Papua New Guinea is highly vulnerable to all kinds of natural disasters, both the hydro-meteorological and geo-physical, such as earthquakes, tsunamis, volcanic activity, floods, and wind storms. Floods, earthquakes, and volcanic eruptions were the three natural disasters that occurred in 2005 and these disasters caused considerable numbers of total affected people. The affected population figures from these disasters were some of the highest in Oceania in 2005.

The Philippines is located on the Pacific Rim of Fire, making it vulnerable to natural disasters of both the hydro-meteorological and geo-physical types. As in previous years, the damage caused by hydro-meteorological disasters grew in 2005, with very large populations affected by floods and wind storms. Floods also caused extensive economic damage in 2005.

Russia is a vast land where the disaster-affected population and economic losses are noticeable. Floods, landslides, extreme temperature and windstorms affected large numbers of people in 2005. Floods also caused considerable economic losses and affected many people.

Saudi Arabia also suffered from floods in 2005, as in 2003, but the number of people affected by those floods was relatively small.

The year 2005 was not nearly as disastrous as 2004 for **Sri Lanka**, which is located in the Indian Ocean just south of India. Sri Lanka frequently experiences droughts during its dry seasons, and windstorms, floods, and subsequent landslides during its rainy seasons due to cyclones from the Bay of Bengal. These natural disasters have been the country's prime concerns thus far. In 2004, Sri Lanka was devastated by the record-breaking Indian Ocean Tsunami, which caused tremendous human losses and numbers of affected population. The economic damage caused by this tsunami was so huge as to have severely affected the country’s economic progress. The scale of the human and economic losses sustained triggered a massive outpouring of international assistance to that country in 2004. This continued in 2005, as tsunami recovery efforts proceeded at a slow pace. Compounding this catastrophe, Sri Lanka also experienced floods in 2005, which affected more than 145,000 people.

Wind storms and floods also affected **Taiwan (China)** in 2005, yielding relatively high numbers of affected people and economic damage.

Tajikistan's prime concerns are earthquakes and floods, as much of the land is mountainous. In 2005, landslides and floods occurred, causing human suffering and economic damage.

Like 2004, the year 2005 was a bad year for flooding in **Thailand**. Floods killed more than 76 people, affected more than 250,000, and caused damage of more than US$14 million. Most of the country's economic damage (more than US$ 250 million) came from drought. Thailand is highly prone to natural disasters because of its location and terrain. The northeastern area is prone to floods and droughts, while the south is vulnerable to storms, floods, and landslides. Thailand was hit hard by these disasters in 2005, and the population affected by hydro-meteorological disasters was quite large.

Floods were reported in **Uzbekistan** in 2005**,** but their impact was small.

Vietnam is located in the southeast monsoon climate area, and the majority of the annual rainfall occurs during the rainy season, which causes heavy human and economic losses every year. Droughts, floods, and wind storms caused severe human suffering and economic losses in Vietnam in 2005. These disasters affected more than 850,000 people and caused more than US$295 million in damage.

Human suffering in **Yemen** in 2005 was caused primarily by epidemics, floods and landslides.

The tables above show that the majority of Asian and ADRC member countries experienced either hydro-meteorological disasters and/or geo-physical disasters, which inflicted heavy human and economic losses on society and created hurdles for economic development. Furthermore, the heavy effects of these disasters deprived people of opportunities for socio-economic advancement, thereby slowing down the pace of national and regional development. The most severe disasters of 2005 happened in Asia (Pakistan, India, China, Bangladesh, Vietnam, Indonesia, Sri Lanka, Thailand and Philippines) and affected large numbers of people. The South Asian Earthquake and the floods in India, China, and Bangladesh were particularly damaging, causing destruction at home and hindering economic and development progress region wide. It is imperative that efforts be made to design and implement proper disaster mitigation and preparedness plans to reduce human losses, suffering, and economic losses, and to contribute to sustainable development on a global scale.

4.3 Conclusions

The year 2005 witnessed severe natural disasters all over the world. The highest death toll came from the South Asian Earthquake in Pakistan and India, the highest affected population from the floods in Bangladesh, China, and India, and the highest level of economic damage from Hurricanes Katrina and Wilma in the US. Asian region experienced the most severe disaster in many years in the world. Africa also suffered from droughts and floods. Europe experienced floods which claimed heavy losses of human life and caused suffering in the region. Oceania sustained wild fires and windstorms, and was moderately impacted by volcanic eruptions. The US was hit by intense hurricanes that caused the highest levels of economic damage for the year. The long-term disaster data analyses show that low income and low human development countries were affected significantly in terms of their ratios of human losses to population, and damage to GNI. The disaster figures and data for 2005 were consistent with patterns from previous years, but the damage ratio to the economy was higher in the upper middle and high income countries this year. This reinforces the lesson that even developed countries cannot be complacent about disaster reduction strategies and countermeasures. It also highlights the need for continuous review and monitoring of disaster reduction strategies, and underscores the need for effective, practical regional cooperation, and investments in disaster reduction measures.

Although many initiatives have been launched and investments made in developing countries in regions vulnerable to disasters, the increasing frequency and magnitude of natural catastrophes that result in economic loss and human suffering have hindered those initiatives. This book has sought to derive conclusions from analytical evidence in order to integrate disaster risk management initiatives into development objectives. The preceding chapters show that the human development and income levels of a country are crucial determinants for the effective implementation of risk management approaches and post-disaster management initiatives. In addition, the active and effective participation of women in the risk management process has been shown to be crucial to any meaningful disaster countermeasures, especially in the least developed countries.

These general phenomena can be seen not only in ADRC member countries, but also throughout Asia. The obvious vulnerability of this region to geo-physical and hydro-meteorological disasters in terms of demographic, socio-economic, and geo-physical factors justifies the need for prudent development policies and proactive risk management practices, as well as further investments in disaster reduction. This book also advocates for the urgent integration of specific country and regional initiatives into a cohesive disaster management approach with ongoing socio-economic development activities. Since disasters impact every socio-economic aspect of a country, designing development-oriented disaster prevention measures that incorporate the strength of human and economic resources would be an appropriate method of ensuring effective sustainable development.

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