

Table 1 Total number of reported disasters* by continent and by year (1990 to 1999)

	AFRICA	AMERICAS	ASIA	EUROPE	OCEANIA	TOTAL
1990	51	106	215	138	36	546
1991	69	141	245	95	18	568
1992	60	105	194	70	17	446
1993	52	110	247	60	14	483
1994	47	66	135	59	15	322
1995	62	110	180	71	8	431
1996	79	100	187	56	17	439
1997	87	101	208	63	15	474
1998	109	126	229	50	18	532
1999	182	123	231	72	15	623
Total	798	1,088	2,071	734	173	4,864

Source: EM-DAT, CRED, University of Louvain, Belgium

Table 2 Total number of people reported killed by continent and by year (1990 to 1999)

	AFRICA	AMERICAS	ASIA	EUROPE	OCEANIA	TOTAL
1990	3,049	2,374	53,528	1,762	124	60,837
1991	15,368	13,534	169,370	2,872	315	201,459
1992	5,622	2,874	15,667	835	6	25,004
1993	2,230	4,690	26,279	926	120	34,245
1994	4,583	2,459	12,867	1,996	70	21,975
1995	6,155	2,708	22,166	3,333	24	34,386
1996	16,873	2,720	16,688	928	111	37,320
1997	13,288	2,810	17,687	1,032	398	35,215
1998	12,217	13,254	32,875	1,005	2,341	61,692
1999	6,166	33,635	39,072	1,426	105	80,404
Total	85,551	81,058	406,199	16,115	3,614	592,537

Source: EM-DAT, CRED, University of Louvain, Belgium

* excluding conflict and chronic public health disasters

As can be seen from table 1, from 1990 to 1999, Asia was the continent the most frequently hit by disasters, with more than 40 per cent of the total number recorded in EM-DAT.

Globally, the number of reported disasters has remained relatively stable except for 1994 and 1999. However, since the mid-1990s in Africa and Asia, there seems to have been a gradual increase in the number of disasters; despite preparedness programmes, both continents have been more and more affected by disasters. Setbacks in development programmes and conflict may have contributed to these increases.

Table 2 shows that the number of fatalities resulting from disasters has increased each year since 1994. Once again, Asia represents more than two-thirds of the total number of fatalities. The worst year for fatalities was 1991, when a cyclone devastated Bangladesh, leading to some 139,000 deaths, and several cholera epidemics in Africa killed about 19,000 people. The Americas saw its worst year in 1999, when official estimates set the number of dead from the Venezuelan floods at 30,000. In Europe, deaths totalled less than 2,000 a year, except for 1991 (a flood in Soviet Union killed 1,700 people), 1994 (more than 1,800 died when the ferry 'Estonia' sank) and 1995 (an earthquake in Russia killed 1,989 people).

Table 3 Total number of people reported affected by continent and by year (1990 to 1999)

	AFRICA	AMERICAS	ASIA	EUROPE	OCEANIA	TOTAL
1990	14,880,561	3,355,949	93,509,065	527,829	211,897	112,485,301
1991	15,662,874	854,527	323,653,306	71,657	93,713	340,336,077
1992	21,409,805	2,532,078	52,003,996	46,756	1,848,802	77,841,437
1993	1,207,407	5,792,964	175,572,442	1,384,499	5,177,079	189,134,391
1994	15,294,614	3,295,780	169,811,321	593,883	6,139,042	195,134,640
1995	9,365,619	1,348,351	242,368,376	6,478,674	2,681,939	262,242,959
1996	7,463,691	1,494,614	163,649,742	3,529,364	652,127	176,789,538
1997	6,222,444	2,023,219	22,253,747	660,735	1,224,060	32,384,205
1998	6,650,746	22,502,581	330,031,355	522,869	328,059	360,035,610
1999	6,294,514	13,494,780	187,617,273	4,986,835	151,245	212,544,647
Total	104,452,275	56,694,843	1,760,470,623	18,803,101	18,507,963	1,958,928,805

Source: EM-DAT, CRED, University of Louvain, Belgium

Table 4 Total amount of estimated damage by continent and by year (1990 to 1999) in US\$ thousands

	AFRICA	AMERICAS	ASIA	EUROPE	OCEANIA	TOTAL
1990	740,600	4,891,950	27,955,900	15,958,500	1,010,400	50,557,350
1991	21,200	13,425,695	34,182,422	66,182,700	1,315,520	115,127,537
1992	232,200	35,706,949	14,134,542	3,766,300	2,054,113	55,894,104
1993	23,875	21,587,877	14,110,181	2,581,960	1,419,600	39,723,493
1994	440,564	25,338,568	27,654,199	18,451,700	1,689,600	73,574,631
1995	123,339	22,848,939	156,313,591	11,337,189	1,278,700	191,901,758
1996	111,000	13,042,400	29,549,992	1,488,100	989,033	45,180,525
1997	89,500	8,055,887	25,446,600	9,799,500	206,700	43,598,187
1998	240,780	21,549,567	29,844,037	1,465,200	178,000	53,277,584
1999	516,744	11,782,450	41,887,927	17,158,331	852,762	72,198,214
Total	2,539,802	178,230,282	401,079,391	148,189,480	10,994,428	741,033,383

Source: EM-DAT, CRED, University of Louvain, Belgium

Globally, almost 2 billion people have been affected by disasters during the 1990s, of whom some 90 per cent live in Asia as can be seen from table 3. The decade's two El Niño years (1991 and 1998) show the highest numbers of affected, but floods in China account for some 60 per cent of the disaster-affected during these two years (210,232,227 in May 1991, and 238,973,000 in August 1998). Population density in disaster-prone countries obviously has a direct effect on the number of people affected.

In table 4, Asia again tops the list with more than 50 per cent of the total amount of estimated damage recorded during the 1990s. However, this percentage is essentially the consequence of the 1995 Kobe earthquake (US\$ 131.5 million). In 1991, floods in Russia caused damage estimated at US\$ 60 million. The financial value attached to infrastructure in the more developed nations is several magnitudes higher than that attached to equivalent structures in developing countries. Moreover, damage to infrastructure will always result in higher damage estimate than suffering of individuals, which cannot be calculated in economic terms.

Table 5 Total number of reported disasters by type of phenomenon and by year (1990 to 1999)

	Avalanches/ landslides	Droughts	Earth- quakes	Epidemics*	Extreme temperatures	Floods	Forest/ scrub fires	Volcanoes	Wind storms	Other natural disasters**	Non-natural disasters***	Total
1990	6	11	57	18	15	66	5	2	147		219	546
1991	11	14	29	45	10	87	9	11	70	2	280	568
1992	17	23	26	26	10	60	8	5	89		182	446
1993	25	10	18	4	5	88	2	6	106	2	217	483
1994	5	8	20	8	9	78	12	8	58		116	322
1995	15	12	24	22	14	93	7	4	58	4	178	431
1996	24	6	11	34	6	73	4	5	66	2	208	439
1997	13	11	14	49	13	80	15	4	69	3	203	474
1998	23	22	17	64	13	94	16	4	73	2	204	532
1999	14	26	33	70	7	110	22	5	85	2	249	623
Total	153	143	249	340	102	829	100	54	821	17	2,056	4,864

* Does not include chronic public health disasters, such as the AIDS pandemic

** Insect infestations, waves/surges

*** Industrial, transport and miscellaneous accidents

Source: EM-DAT, CRED, University of Louvain, Belgium

Table 5 shows the total number of reported disasters from 1990 to 1999. During this period, EM-DAT recorded more natural than man-made disasters (respectively, 57 and 43 per cent). Floods and wind storms represent more than 58 per cent of the total of natural disasters and about 34 per cent of the total number of recorded disasters. However, no link could be identified between the occurrence of a specific type of phenomenon and the El Niño years (1991 and 1998), although more people were affected in those years.

**Table 6** Total number of people reported killed by type of phenomenon and by year (1990 to 1999)

	Avalanches/ landslides	Droughts	Earth- quakes	Epidemics*	Extreme temperatures	Floods	Forest/ scrub fires	Volcanoes	Wind storms	Other natural disasters**	Non-natural disasters***	Total
1990	200		38,068	2,864	996	3,662	1	33	5,689		9,324	60,837
1991	821	2,000	4,809	28,540	800	8,455	102	715	146,061	10	9,146	201,459
1992	1,106		3,554	5,533	390	4,942	122	2	2,223		7,132	25,004
1993	1,618		9,819	859	106	8,977	3	149	3,143	59	9,512	34,245
1994	158		1,336	2,240	380	7,398	62	124	4,371		5,906	21,975
1995	1,449		8,257	4,069	1,708	8,497	29		3,244		7,133	34,386
1996	1,129		582	9,948	300	7,131	45	4	5,232	32	8,961	37,320
1997	806	530	2,960	13,092	431	6,866	32	53	5,133	400	8,056	35,215
1998	1,044	260	7,423	11,224	3,225	13,644	109		14,804	2,182	7,777	61,692
1999	327		21,870	4,866	719	34,298	70		11,890	3	6,361	80,404
Total	8,658	2,790	98,678	84,047	9,055	103,870	575	1,080	201,790	2,686	79,308	592,537

* Does not include chronic public health disasters, such as the AIDS pandemic

** Insect infestations, waves/surges

*** Industrial, transport and miscellaneous accidents

Source: EM-DAT, CRED, University of Louvain, Belgium

Table 6 shows that, in the 1990s, wind storms were the biggest killers: approximately one-third of all reported deaths were due to wind storms. Fatalities were particularly high in 1991, largely due to the cyclone in Bangladesh (see table 2 comments). Floods, earthquakes and epidemics also killed about 1 million people each. The number of people reported killed by floods in 1999 is more than double the total of other years in the 1990s. This was due to the floods in Venezuela (see table 2 comments). The number of people killed by earthquakes was particularly high in 1990 (Iranian quake on 6 June 1990: 36,000 people reported killed) and in 1999 (Turkish quake on 17 August 1999: 17,127 people reported killed).

Table 7 Total number of people reported affected by type of phenomenon and by year (1990 to 1999)

	Avalanches/ landslides	Droughts	Earth- quakes	Epidemics*	Extreme temperatures	Floods	Forest/ scrub fires	Volcanoes	Wind storms	Other natural disasters**	Non-natural disasters***	Total
1990	5,115	15,753,160	2,107,674	44,015	1,000,260	67,391,247		46,851	26,098,695		38,284	112,485,301
1991	35,971	22,816,282	1,107,914	1,942,895	450	285,564,130	2,519	865,002	27,845,250	2,000	153,664	340,336,077
1992	57,735	37,047,103	775,897	680,420	16,240	21,842,835	52,025	361,075	16,934,932		73,175	77,841,437
1993	23,832	9,621,507	242,678	417,164	3,005,760	155,285,875	130	173,753	20,307,335		56,357	189,134,391
1994	162,366	11,615,000	618,737	6,564,353	1,608,184	130,411,797	3,292,413	291,869	40,545,837		24,084	195,134,640
1995	1,117,223	26,922,904	1,361,146	441,592	515,278	219,617,488	11,754	16,876	12,196,340	200	42,158	262,242,959
1996	8,686	5,910,000	1,908,498	643,470	60,200	151,952,638	5,811	6,572	16,259,513	24	34,126	176,789,538
1997	11,736	4,830,100	542,452	322,267	614,580	13,326,790	53,159	7,200	12,527,424	10,000	138,497	32,384,205
1998	230,131	20,329,335	1,827,021	915,180	36,286	306,928,966	166,432	7,808	29,488,992	9,867	95,592	360,035,610
1999	15,291	30,227,145	3,893,465	466,852	725,246	147,253,658	17,930	34,055	29,891,154	1,300	18,551	212,544,647
Total	1,668,086	185,072,536	14,385,482	12,438,208	7,582,484	1,499,575,424	3,602,173	1,811,061	232,095,472	23,391	674,488	1,958,928,805

* Does not include chronic public health disasters, such as the AIDS pandemic

** Insect infestations, waves/surges

*** Industrial, transport and miscellaneous accidents

Source: EM-DAT, CRED, University of Louvain, Belgium

During the last decade, floods have affected about 1.5 billion people, i.e., more than 75 per cent of the total of people reported affected by disasters worldwide. Floods in China, with 1,026,700,000 people affected over the last decade (i.e., almost 70 per cent of the floods' total), are the principal cause. The raw numbers of flood-affected people do not reflect a particular trend, but the worst numbers were recorded in the El Niño years, 1991 and 1998. Wind storms and droughts have also affected many people (respectively 11.8 and 9.4 per cent of the total of people reported affected). Non-natural disasters recorded have affected very few people (less than 0.035 per cent of the total); this, however, could be a reporting artefact.

Table 8 Total amount of estimated damage by type of phenomenon and by year (1990 to 1999) in US\$ thousands

	Avalanches/ landslides	Droughts	Earth- quakes	Epidemics*	Extreme temperatures	Floods	Forest/ scrub fires	Volcanoes	Wind storms	Other natural disasters**	Non-natural disasters***	Total
1990		1,036,000	8,221,150		360,250	6,156,600	991,000	8,000	30,497,735		3,286,615	50,557,350
1991	15,400	2,073,000	2,287,088		972,000	73,658,693	14,780,000	239,200	11,753,183		9,348,973	115,127,537
1992	32,249	2,488,600	653,850		2,950,000	5,436,345	421,200		41,125,723		2,786,137	55,894,104
1993	710,790	1,105,200	1,929,000			23,275,328	1,000,000	488	8,046,158		3,656,529	39,723,493
1994	38,300	1,223,755	31,781,004		2,230,000	27,106,724	152,000	400,440	8,478,408		2,164,000	73,574,631
1995	10,289	5,776,539	132,977,000		1,134,300	26,459,042	134,500		23,644,689	104,000	1,661,399	191,901,758
1996		1,200,000	528,400		12,000	24,227,042	1,712,800	16,500	13,355,683		4,128,100	45,180,525
1997	116,300	2,000	4,792,000		3,004,000	11,148,287	17,009,200	8,000	7,127,900	3,500	387,000	43,598,187
1998	5,700	359,970	378,100		3,700,000	33,051,080	564,100		14,594,493	1,700	622,441	53,277,584
1999		6,676,000	31,475,619			13,042,759	210,636		20,767,721	267	25,212	72,198,214
Total	929,028	21,941,064	215,023,211		14,362,550	243,561,900	36,975,436	672,628	179,391,693	109,467	28,066,406	741,033,383

* Does not include chronic public health disasters, such as the AIDS pandemic

** Insect infestations, waves/surges

*** Industrial, transport and miscellaneous accidents

Source: EM-DAT, CRED, University of Louvain, Belgium

Damage estimations are notoriously unreliable. Methodologies are not standard, and coverage is not complete. Depending on where the disaster occurred and who is reporting, estimates will vary from none to billions of US dollars. Floods, earthquakes and wind storms were the most costly types of phenomenon in the 1990s. No direct damage is ever reported after epidemics. Estimates of life years lost or cost in terms of productivity losses, however, could be undertaken.