

## 28. Natural disasters

Natural disasters have a profound impact on the quality of life through their destruction of food crops and livestock, and forced dislocation of households and communities. Their toll on lives and the instant poverty they cause are among their most devastating impacts.

The Asian and Pacific region is one of the most vulnerable to natural disasters, experiencing a wide variety of natural hazards, including floods, cyclones, earthquakes, drought, storm surges and tsunamis. The effect of natural hazards on the loss of human lives is directly linked to the poverty level of a given country.

The region accounts for a majority of the total number of deaths caused by natural disasters globally. In 2006, for example, natural disasters claimed 13,276 lives in the Asia and the Pacific (table 28.1). This was twice the number of deaths in Africa — the region with the second highest toll due to natural disasters — and far above the 3,000-plus deaths in Europe. While natural disasters do not recognize borders or distinguish between income levels, in Asia and the Pacific it was the high-income economies that were the least affected in terms of both deaths and the number of persons affected.

According to some estimates, the number of natural disasters has been increasing around the world, but the trends in lives lost and damage caused have changed in recent years due to effective use of technology, communication and transportation systems. Over the past five decades, the average number of deaths caused annually by natural disasters was about 100,000; in contrast, the average over the last 15 years has been about 41,000.

Tropical cyclones occur more frequently in the Asian and Pacific region than in any other part of the world and are usually accompanied by severe flooding.

While cyclones affect most of the Asian and Pacific region, they have taken a particularly high toll on South Asia. Bangladesh is commonly affected by floods and wind storms, which contributed to the high number of deaths in that country during the periods 1996 to 2000 and 2001 to 2005 while affecting over 30 million people. A strong wind storm in April 1991 was largely responsible for the high number of deaths (145,400) in Bangladesh during the period 1991 to 1995. Moreover, severe flooding during the periods 1991 to 1995 and 2001 to 2005 were responsible for a high number of deaths in Pakistan and India.

Geological disasters can be very destructive in terms of human lives, as was the case with the October 2005 earthquake in Pakistan, which claimed more than 70,000 lives and affected another 5 million people. That single disaster accounted for most of the deaths that occurred in Pakistan during the period 2001 to 2005.

According to information from the Centre for Research on the Epidemiology of Disasters (CRED), the highest loss of life in South Asia has been caused by drought. In September 2001, more than a million people were affected by a drought in Sri Lanka, and, during the summer of 2002, more than 300 million people were affected by a severe drought in India.

The December 2004 tsunami claimed the highest number of lives in recent history, as shown by data of affected countries in table 28.1. Consequently, the number of deaths caused by waves and surges counts for 61 per cent of the total number of deaths in South-East Asia.

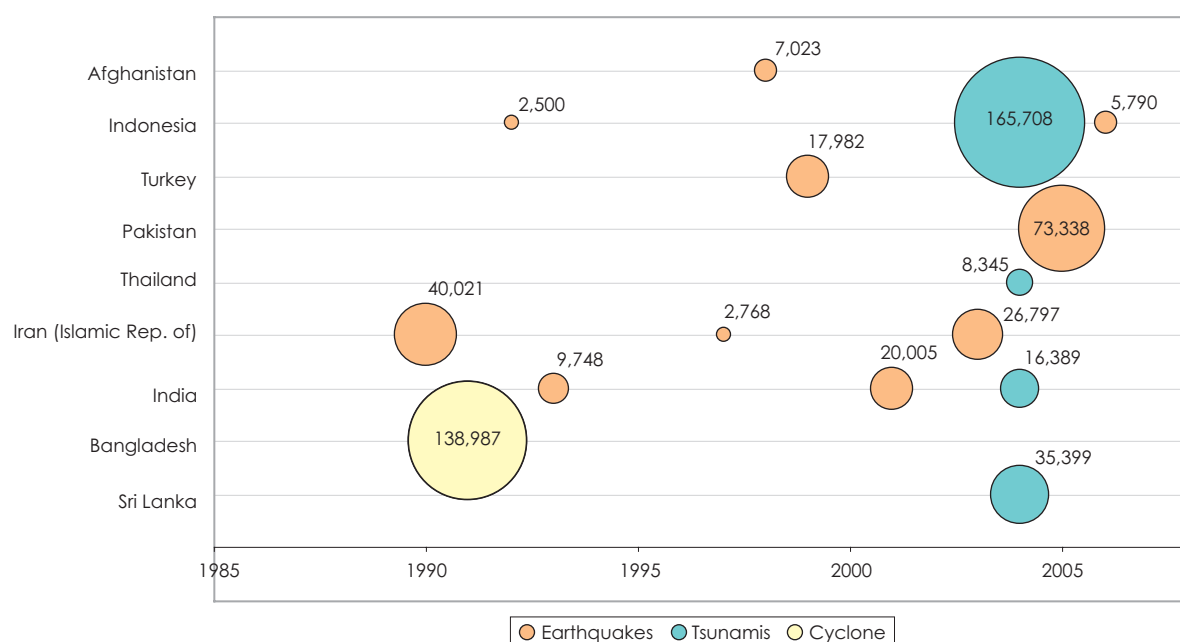
Floods and storms are the second cause of deaths in South-East Asia, mainly affecting Indonesia, Malaysia and the Philippines. Recurrent floods in Indonesia contributed to the high cumulative number of people affected between 2002 and 2006. In the Philippines, storms stand as the most common cause of death as well as the number of people affected by natural disasters.

Drought and wildfires also affect the region. Wildfires in Indonesia in October 1994 affected up to 3 million people, while Cambodia, the Lao People's Democratic Republic, Myanmar and Thailand have suffered the effects of severe drought in recent years, and this has contributed to the high number of people affected during the period 2001 to 2005. The economic impact of wildfires has been particularly negative in many of these countries.

In North-East Asia, typhoons and floods have had the most significant socio-economic impact, accounting for about 80 per cent of deaths and 60 per cent of total damage. Floods throughout China repeatedly affected its citizens during the 1990s. In the summer of 1998, floods affected close to a quarter of a billion people in China, accounting for most of the people affected between 1996 and 2000. Floods were also responsible for a significant death toll in the Democratic People's Republic of Korea in 2006, when 278 people died and another 84,500 people were affected.

In January 1995, a strong earthquake in Japan took the lives of more than 5,000 and affected

Figure 28.1 Major natural disaster events in the Asian and Pacific region, 1988-2007  
(number of deaths)



another half-million people. Although the local infrastructure to mitigate the effects of earthquakes is highly developed, the economic cost of the disasters was still considerable.

The pattern of impacts of natural disasters in the Pacific is similar to that of other subregions. Wave/surges, wind storms and floods entail the greatest loss of life. In Fiji, wind storms affected a significant portion of the population throughout the 1990s, and, in Papua New Guinea, a tsunami was responsible for over 2,000 deaths in July 1998. On the other hand, droughts, wild fires and extreme temperatures have affected Australia, as in 1992, when a severe drought affected over 7 million people. Extreme temperatures in subsequent years contributed to the cumulative number of people affected during the period 1991 to 1995, as reported in table 28.2.

Losses caused by natural disasters are particularly damaging in the Asian and Pacific region, depriving countries of resources that could otherwise be used for economic and social development. In some areas, the death toll and damage from such disasters have set social development back years. For this reason, national and regional efforts for natural disaster reduction should be closely linked with poverty alleviation and economic and social development activities. In this context, regional cooperation in disaster management, including infrastructure development, is essential if countries are to be able to cope with the escalating effects. It is also essential in order to help ensure the sustainable economic growth of the region.

**Deaths caused by natural disasters (cumulative number over the period):** The number of deaths recorded due to natural disasters, expressed as a cumulative number over five-years periods. **Aggregates:** Sum of individual country values. **Source:** Calculated by ESCAP using data from EM-DAT: Emergency Events Database, (online database, accessed in June 2007).

**Natural disasters mortality ratio (per 100,000 deaths):** The cumulative number of deaths recorded due to natural disasters in a five-year period divided by the number of total deaths of all causes during the same period, expressed per 100,000 deaths. **Aggregates:** Averages are calculated as the sum of

natural disasters deaths divided by the sum of total deaths. **Source:** Calculated by ESCAP using data from EM-DAT: Emergency Events Database, (online database, accessed on June 2007) and *World Population Prospects: The 2006 revision* Population Database (online database, accessed in July 2007).

**People affected by natural disasters (cumulative number over the period):** The total number of people affected by natural disasters over a five-year period. Affected people are people requiring immediate assistance during a period of emergency, such as food, water, shelter, sanitation and immediate medical assistance. The definition includes cases of an infectious disease introduced in a region or a population

that is usually free from that disease. *Aggregates:* Sum of individual country values. *Source:* Calculated by ESCAP using data from EM-DAT: Emergency Events Database, (online database, accessed in June 2007).

**People affected by natural disasters (per 100,000 population):** The total number of people affected by natural disasters divided by total population, calculated for five-year periods and expressed per 100,000 population. Affected people are people requiring immediate assistance during

a period of emergency, such as food, water, shelter, sanitation and immediate medical assistance. The definition includes cases of an infectious disease introduced in a region or a population that is usually free from that disease. *Aggregates:* Averages are calculated as the sum of number of people affected by natural disasters divided by total population. *Source:* Calculated by ESCAP using data from EM-DAT: Emergency Events Database, (online database, accessed on June 2007) and *World Population Prospects: The 2006 revision* Population Database (online database, accessed in July 2007).

## 28.1 Natural disasters, mortality

	Deaths caused by natural disasters				Natural disasters mortality ratio			
	Cumulative number over the period				Per 100,000 deaths			
	91-95	96-00	01-05	2006	91-95	96-00	01-05	2006
<b>East and North-East Asia</b>								
China	13 458	13 040	5 520	1 863	32	31	13	20
DPR Korea	74	254	344	278	11	28	31	120
Hong Kong, China	120	3	303	0	74	2	164	0
Macao, China	0	0	0	0	0	0	0	0
Mongolia	18	97	34	0	18	109	40	0
Republic of Korea	303	742	375	58	24	59	29	21
<b>South-East Asia</b>								
Brunei Darussalam								
Cambodia	656	484	101	12	107	76	15	9
Indonesia	4 109	3 320	168 896	7 180	53	45	2 334	492
Lao PDR	743	89	2	0	287	38	1	0
Malaysia	385	471	128	9	79	92	23	8
Myanmar	96	90	396	59	4	4	17	12
Philippines	10 706	1 653	3 108	1 487	528	83	153	355
Singapore	0	3	33	0	0	3	32	0
Thailand	675	371	8 908	179	32	15	337	33
Timor-Leste								
Viet Nam	1 683	6 557	1 286	412	70	302	60	94
<b>South and South-West Asia</b>								
Afghanistan	2 807	8 315	5 311	182	156	375	214	34
Bangladesh	145 400	2 611	2 976	109	2 220	43	50	9
Bhutan	39	200	0	0	120	776	0	0
India	20 727	28 605	48 814	698	47	63	103	7
Iran (Islamic Rep. of)	617	3 185	28 393	77	31	175	1 517	20
Maldives	0	0	102	0	0	0	1 123	0
Nepal	3 609	2 335	1 257	157	300	206	113	71
Pakistan	4 510	2 094	75 363	198	76	35	1 292	17
Sri Lanka	118	21	35 646	0	20	3	5 170	0
Turkey	1 341	18 238	457	32	62	899	22	7
<b>North and Central Asia</b>								
Armenia	0	4	1	0	0	3	1	0
Azerbaijan	5	55	0	0	2	20	0	0
Georgia	10	0	7	0	4	0	3	0
Kazakhstan	122	7	54	0	15	1	7	0
Kyrgyzstan	220	34	90	4	123	18	44	10
Russian Federation	367	275	1 278	84	4	3	11	4
Tajikistan	1 606	300	67	25	672	130	31	59
Turkmenistan	0	11	0	0	0	6	0	0
Uzbekistan	10	64	0	0	1	8	0	0
<b>Pacific</b>								
American Samoa			6	0				
Cook Islands	0	19	0	0				
Fiji	22	41	34	4	94	166	130	74
French Polynesia	0	13			0	237		
Guam	1	0	5	0	31	0	120	0
Kiribati	0	0						
Marshall Islands	0	6	0	0				
Micronesia (F.S.)	0	15	48	0	0	442	1 402	0
Nauru								
New Caledonia	0	0	2	0	0	0	33	0
Niue	0	1	1	0				
Northern Mariana Is.								
Palau								
Papua New Guinea	273	2 433	198	15	115	938	69	25
Samoa	13	0	10	0	234	0	195	0
Solomon Islands	4	0	0	0	23	0	0	0
Tonga	0	0	0	0	0	0	0	0
Tuvalu	0	0						
Vanuatu	6	44	4	0	105	736	69	0
<b>ESCAP Developed Economies</b>								
Australia	71	55	40	2	12	8	6	1
Japan	5 849	218	380	152	133	5	7	14
New Zealand	0	4	6	0	0	3	4	0
ESCAP	220 773	96 377	389 984	13 276	153	66	256	42
LLDC	9 179	11 511	6 816	368	153	180	103	27
LDC	153 373	14 168	10 159	519	1 213	112	79	20
SIDS	319	2 575	443	19	80	595	94	19
ASEAN	19 053	13 038	182 858	9 338	107	74	1 017	256
SAARC	177 210	44 181	169 469	1 344	293	72	266	10
Central Asia	1 973	475	219	29	69	16	7	5
Low-income	182 436	54 362	136 239	2 149	270	79	192	15
Middle-income	31 993	40 957	252 600	10 915	45	58	342	71
High-income	6 344	1 038	1 144	212	95	15	15	13
Africa	25 689	47 837	29 501	6 277	60	101	56	57
Latin America & Carib.	18 083	56 034	13 152	274	119	362	81	8
North America	1 896	1 643	2 500	280	15	13	19	10
Europe	943	1 926	47 327	3 025	3	6	156	49
Other Asia-Pacific			858	36			25	5
World	267 580	206 855	483 322	23 168	105	76	168	41

## 28.2 Natural disasters, affected population

	People affected by natural disasters							
	Cumulative number over the period				Per 100,000 population			
	91-95	96-00	01-05	2006	91-95	96-00	01-05	2006
<b>East and North-East Asia</b>								
China	619 062 923	598 872 265	685 316 144	93 594 012	10 412	9 595	10 571	7 086
DPR Korea	6 202 500	3 978 687	468 981	84 500	5 882	3 537	401	356
Hong Kong, China	7 901	748	4 989	0	26	2	14	0
Macao, China	3 986	0	1	0	200	0	0	0
Mongolia	100 000	1 076 169	1 295 659	0	858	8 823	10 228	0
Republic of Korea	38 527	222 086	605 778	4 500	17	96	255	9
<b>South-East Asia</b>								
Brunei Darussalam	0	0	0	0				
Cambodia	1 309 400	10 434 375	4 689 182	38 000	2 442	17 033	6 952	268
Indonesia	4 647 200	2 916 749	1 483 913	3 317 003	485	283	135	1 449
Lao PDR	2 429 106	899 685	603 000	0	10 923	3 584	2 197	0
Malaysia	31 773	29 411	115 447	36 518	32	26	93	140
Myanmar	479 246	187 418	94 466	70 106	228	84	40	145
Philippines	20 937 193	11 037 617	7 189 929	4 960 224	6 381	3 019	1 771	5 750
Singapore	0	2 033	205	0	0	11	1	0
Thailand	10 369 760	9 032 008	10 489 861	3 234 786	3 688	3 039	3 378	5 099
Timor-Leste	0	0	3 894	8 730	0	0	81	784
Viet Nam	1 858 617	20 140 610	6 453 640	1 521 133	527	5 242	1 562	1 765
<b>South and South-West Asia</b>								
Afghanistan	259 604	315 081	3 153 379	308 330	326	317	2 721	1 182
Bangladesh	54 564 688	30 035 307	41 060 559	1 505 899	9 020	4 478	5 559	965
Bhutan	66 094	1 000	0	0	2 522	38	0	0
India	184 722 228	166 725 019	489 501 667	6 462 889	4 031	3 302	8 905	561
Iran (Islamic Rep. of)	781 947	332 544	38 993 302	171 304	260	103	11 460	244
Maldives	23 849	0	27 214	0	2 027	0	1 901	0
Nepal	701 047	297 436	1 178 195	80 000	680	255	905	289
Pakistan	21 072 431	2 912 664	15 375 445	2 405	3 457	423	2 014	1
Sri Lanka	2 131 381	1 530 534	3 559 466	0	2 406	1 656	3 754	0
Turkey	837 026	4 469 081	641 695	222	276	1 354	181	0
<b>North and Central Asia</b>								
Armenia	0	319 144	0	0	0	2 043	0	0
Azerbaijan	1 658 800	787 474	31 500	0	4 384	1 964	76	0
Georgia	4 050	200	22 646	600	15	1	99	14
Kazakhstan	30 000	611 373	65 306	0	37	800	87	0
Kyrgyzstan	195 306	9 294	3 361	9 075	865	39	13	173
Russian Federation	298 500	0	0	0	40	0	0	0
Tajikistan	144 908	262 116	423 923	29 155	517	871	1 326	439
Turkmenistan	420	0	0	0	2	0	0	0
Uzbekistan	50 400	148	601 500	0	46	0	466	0
<b>Pacific</b>								
American Samoa	0	0	23 063	0	0	0	7 545	0
Cook Islands	0	900	1 352	0	0	1 063	1 834	0
Fiji	162 003	268 727	35 600	392	4 327	6 810	871	47
French Polynesia	0	511	0	0	0	45	0	0
Guam	5 613	6 420	15 644	0	795	849	1 918	0
Kiribati	0	84 000	0	0	0	20 699	0	0
Marshall Islands	6 000	218	0	0	2 404	84	0	0
Micronesia (F.S.)	0	2 689	8 631	0	0	500	1 588	0
Nauru	0	0	0	0				
New Caledonia	0	0	1 537	0	0	0	136	0
Niue	0	297	702	0	0	2 912	8 177	0
Northern Mariana Is.	0	0	0	0				
Palau	0	0	0	0				
Papua New Guinea	361 242	570 204	60 369	13 921	1 616	2 233	208	224
Samoa	88 000	0	0	0	10 651	0	0	0
Solomon Islands	88 500	380	1 525	0	5 176	19	68	0
Tonga	0	6 571	16 500	0	0	1 342	3 342	0
Tuvalu	150	0	0	0	310	0	0	0
Vanuatu	13 165	16 500	68 312	0	1 613	1 807	6 677	0
<b>ESCAP Developed Economies</b>								
Australia	14 977 281	658 254	22 908	3 211	17 019	704	23	16
Japan	747 046	775 503	874 950	25 652	120	123	137	20
New Zealand	475	2 890	6 151	1 200	3	15	31	29
ESCAP	951 470 286	869 832 340	1 314 591 491	115 483 767	5 542	4 726	6 731	2 863
LLDC	5 635 685	4 578 920	7 355 823	426 560	1 052	784	1 166	320
LDC	60 022 849	42 271 182	50 879 726	2 011 065	5 532	3 495	3 828	715
SIDS	748 522	959 450	264 548	23 043	1 342	1 529	378	155
ASEAN	42 062 295	54 679 906	31 119 643	13 177 770	1 813	2 172	1 150	2 338
SAARC	263 541 322	201 817 041	553 855 925	8 359 523	4 340	3 003	7 541	542
Central Asia	2 083 884	1 989 749	1 148 236	38 830	608	564	315	52
Low-income	274 539 223	237 844 593	564 968 745	10 134 143	3 965	3 109	6 773	579
Middle-income	661 150 084	630 318 105	748 088 529	105 315 061	7 153	6 483	7 383	5 086
High-income	15 780 829	1 668 445	1 532 163	34 563	1 576	162	145	16
Africa	51 596 935	29 134 737	100 488 133	8 232 323	1 594	794	2 436	933
Latin America & Carib.	9 506 363	25 788 983	27 254 829	1 221 525	406	1 016	1 002	216
North America	1 306 531	3 996 081	1 510 270	84 699	89	259	93	25
Europe	6 605 035	7 498 605	2 059 636	50 524	234	264	72	9
Other Asia-Pacific	216 239	525 692	706 342	2 745	52	101	108	2
World	1 020 701 389	936 776 438	1 446 610 701	125 075 583	3 718	3 173	4 589	1 915