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

4.1 Types of Disasters and their Effects in Asian and ADRC Member Countries:

This section deals with the pattern of disasters in Asian and ADRC member countries. Among ADRC's 24 member countries, 18 countries (excluding Singapore, Armenia, Myanmar, Lao PDR, Cambodia and Uzbekistan) will be discussed with the disaster records of 2003. Remaining six countries does not have record of significant disasters in CRED-EM-DAT database for 2003[3]. Here we also discussed the Asian countries which had recorded disasters for the year 2003 All the ADRC member countries are from Asia except Papua New Guinea and Russia. Table 10 shows the disaster situation according to disaster type of each member country..

According to Table 10, **drought** seriously affected China, the second highest affected population in the world in 2003. Having a severe impact on the human development activities of these countries, droughts have also badly affected the countries of Indonesia, Pakistan and Russia..

The impact of **earthquakes** is quite deep in countries like Iran, Afghanistan, Bangladesh, China, Indonesia, Japan, Kazakhstan and Russia in terms of affected people and economy. Iran (Bam) Earthquake is the severest in the world in 2003 in terms of human loss and economic damages. China also suffered severe losses due to earthquakes in terms of human loss and economic damages. Earthquake has also caused considerable effect in Japan in 2003.

Epidemics had impact on India, Tajikistan and Vietnam in terms of *totally* affected people. Also, the number of people who died due to epidemics is evident only from Vietnam

Extreme temperatures inflicted human loss in India, Bangladesh, Nepal and Pakistan at significant levels in terms of human loss.

The most severe disasters in member countries are **windstorms** and **floods**. More than 80% of the total human loss in ADRC member countries is due to these two disasters. Further, about half of the affected population is also due to floods and windstorms. It can also be seen from the data that nearly 80% of the total economic loss in member countries is due to floods and windstorms. Among member countries, the severest damage in terms of human suffering and economic loss occurred in China, Korea, India, Bangladesh, Sri Lanka, Philippines, Thailand, and Vietnam, though most member countries are affected. Also, **slides** caused considerable human suffering in Philippines, Indonesia and Papua New Guinea.

Table 10:

Natural Disasters in Asia and in ADRC Member Countries (2003 Summary) (Country/Disaster Type/Disaster Characteristics)

DisType	Country	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Drought	China P Rep	2		51,000,000	
	Indonesia	1		15,000	
	Pakistan	1		54,000	
	Russia	1		1,000,000	
Drought Total		**5**		**52,069,000**	
Earthquake	Afghanistan	1	1	1,001	
	Bangladesh	1	2	2,525	
	China P Rep	11	311	2,881,973	488,968
	Indonesia	3	1	3,249	
	Iran Islam Rep	5	43,201	113,191	1,021,666
	Japan	3	2	21,267	1,207,000
	Kazakhstan	1	3	36,626	
	Russia	1	3	1,805	10,600
Earthquake Total		26	43,524	3,061,637	2,728,234

[3] See Note 1 in page ii.

DisType	Country	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Epidemic	India	1		2,185	
	Iraq	1		0	
	Tajikistan	1		256	
	Viet Nam	1	15	7	
Epidemic Total		**4**	**15**	**2,448**	
Extreme Temperature	Bangladesh	2	215	0	
	India	2	1,610	0	
	Nepal	1	48	0	
	Pakistan	1	200	0	
Extreme Temperature Total		**6**	**2,073**	**0**	
Flood	Afghanistan	8	145	3,750	
	Azerbaijan	1		31,500	
	Bangladesh	2	252	550,000	
	China P Rep	6	695	152,724,340	8,144,640
	East Timor	2	3	1,000	
	India	6	735	7,564,545	169,000
	Indonesia	7	266	88,428	
	Iran Islam Rep	1		1,370	838
	Japan	1	23	814	7,000
	Lebanon	1		0	
	Malaysia	3	8	18,800	
	Mongolia	1	15	1,650	270
	Nepal	1	239	59,254	
	Pakistan	3	266	1,266,243	
	Philippines	1		3,500	
	Russia	1		600	
	Saudi Arabia	2	12	13,050	
	Sri Lanka	1	235	695,000	29,000
	Tajikistan	1	6	1,755	20,000
	Thailand	3	9	107,700	26,400
	Viet Nam	3	128	416,823	105,000
	Yemen	1	15	0	
Flood Total		**56**	**3,052**	**163,550,122**	**8,502,148**
Slides	China P Rep	2	46	0	
	India	1	25	0	

DisType	Country	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
	Indonesia	4	119	231,328	3,298
	Iran Islam Rep	1	20	4	
	Kyrgyzstan	1	38	211	
	Pakistan	1	12	0	
	Papua New Guinea	2	13	621	
	Philippines	1	255	217,988	7,000
	Tajikistan	2	1	6,181	41,000
Slides Total		**15**	**529**	**456,333**	**51,298**
Wild Fires	China P Rep	1		300	
	Russia	1		0	
Wild Fires Total		**2**		**300**	
Wind Storm	Bangladesh	3	58	420	
	China P Rep	5	61	9,480,045	437,938
	Hong Kong (China)	2	4	3,533	
	India	7	164	531,314	44,000
	Japan	2	16	2,400	
	Korea Rep	1	130	80,000	5,500,000
	Oman	1	30	0	
	Pakistan	1	51	2,557	
	Philippines	3	85	155,319	30,468
	Russia	1		0	
	Taiwan (China)	1	3	0	
	Thailand	1		5,000	
	Viet Nam	1		5,018	
Wind Storm Total		**29**	**602**	**10,265,606**	**6,012,406**
Grand Total		**143**	**49,795**	**229,405,446**	**17,294,086**

Source ADRC, Japan and CRED-EMDAT, Universite Catholique de Louvain, Brussels, Belgium, 2003

4.2 Asian and ADRC Member Countries and their Disaster Characteristics:

Table 11:

Natural Disasters in Asia and ADRC Member Countries (2003 Summary) (Disaster Type/Country/Disaster Characteristics)					
Country	DisType	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Afghanistan	Earthquake	1	1	1,001	
	Flood	8	145	3,750	
Afghanistan Total		**9**	**146**	**4,751**	
Azerbaijan	Flood	1		31,500	
Azerbaijan Total		**1**		**31,500**	
Bangladesh	Earthquake	1	2	2,525	
	Extreme Temperature	2	215	0	
	Flood	2	252	550,000	
	Wind Storm	3	58	420	
Bangladesh Total		8	**527**	**552,945**	
China P Rep	Drought	2		51,000,000	
	Earthquake	11	311	2,881,973	488,968
	Flood	6	695	152,724,340	8,144,640
	Slides	2	46	0	
	Wild Fires	1		300	
	Wind Storm	5	61	9,480,045	437,938
China P Rep Total		27	**1,113**	**216.086,658**	**9.071,546**
East Timor	Flood	2	3	1,000	
East Timor Total		2	3	1,000	
Hong Kong (China)	Wind Storm	2	4	3,533	
Hong Kong (China) Total		2	4	**3,533**	
India	Epidemic	1		2,185	
	Extreme Temperature	2	1,610	0	
	Flood	6	735	7,564,545	169 000
	Slides	1	25	0	
	Wind Storm	7	164	531,314	44,000
India Total		17	**2,534**	**8,098,044**	**213,000**

Country	DisType	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Indonesia	Drought	1		15,000	
	Earthquake	3	1	3,249	
	Flood	7	266	88,428	
	Slides	4	119	231,328	3,298
Indonesia Total		**15**	**386**	**338,005**	**3,298**
Iran Islam Rep	Earthquake	5	43,201	113,191	1,021,666
	Flood	1		1,370	838
	Slides	1	20	4	
Iran Islam Rep Total		**7**	**43,221**	**114,565**	**1,022,504**
Iraq	Epidemic	1		0	
Iraq Total		**1**		**0**	
Japan	Earthquake	3	2	21,267	1,207,000
	Flood	1	23	814	7,000
	Wind Storm	2	16	2,400	
Japan Total		**6**	**41**	**24,481**	**1,214,000**
Kazakhstan	Earthquake	1	3	36,626	
Kazakhstan Total		**1**	**3**	**36,626**	
Korea Rep	Wind Storm	1	130	80,000	5,500,000
Korea Rep Total		**1**	**130**	**80,000**	**5,500,000**
Kyrgyzstan	Slides	1	38	211	
Kyrgyzstan Total		**1**	**38**	**211**	
Lebanon	Flood	1		0	
Lebanon Total		**1**		**0**	
Malaysia	Flood	3	8	18,800	
Malaysia Total		**3**	**8**	**18,800**	
Mongolia	Flood	1	15	1,650	270
Mongolia Total		**1**	**15**	**1,650**	**270**
Nepal	Extreme Temperature	1	48	0	
	Flood	1	239	59,254	
Nepal Total		**2**	**287**	**59,254**	
Oman	Wind Storm	1	30	0	
Oman Total		**1**	**30**	**0**	

Country	DisType	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$ ('000s)
Pakistan	Drought	1		54,000	
	Extreme Temperature	1	200	0	
	Flood	3	266	1,266,243	
	Slides	1	12	0	
	Wind Storm	1	51	2,557	
Pakistan Total		**7**	**529**	**1,322,800**	
Papua New Guinea	Slides	2	13	621	
Papua New Guinea Total		**2**	**13**	**621**	
Philippines	Flood	1		3,500	
	Slides	1	255	217,988	7,000
	Wind Storm	3	85	155,319	30,468
Philippines Total		**5**	**340**	**376,807**	**37,468**
Russia	Drought	1		1,000,000	
	Earthquake	1	3	1,805	10,600
	Flood	1		600	
	Wild Fires	1		0	
	Wind Storm	1		0	
Russia Total		5	3	1,002,405	10,600
Saudi Arabia	Flood	2	12	13,050	
Saudi Arabia Total		**2**	**12**	**13,050**	
Sri Lanka	Flood	1	235	695,000	29,000
Sri Lanka Total		**1**	**235**	**695,000**	**29,000**
Taiwan (China)	Wind Storm	1	3	0	
Taiwan (China) Total		**1**	**3**	**0**	
Tajikistan	Epidemic	1		256	
	Flood	1	6	1,755	20,000
	Slides	2	1	6,181	41,000
Tajikistan Total		**4**	**7**	**8,192**	**61,000**
Thailand	Flood	3	9	107,700	26,400
	Wind Storm	1		5,000	
Thailand Total		**4**	**9**	**112,700**	**26,400**

Country	DisType	Count of DisNo	Sum of Killed	Sum of TotAff	Sum of Damage US$('000s)
Viet Nam	Epidemic	1	15	7	
	Flood	3	128	416,823	105,000
	Wind Storm	1		5,018	
Viet Nam Total		**5**	**143**	**421,848**	**105,000**
Yemen	Flood	1	15	0	
Yemen Total		**1**	**15**	**0**	
Grand Total		**143**	**49,795**	**229,405,446**	**17,294,086**

Source: ADRC, Japan and CRED-EMDAT, Universite Catholique de Louvain, Brussels, Belgium, 2003

Table 10 shows the effect of various types of natural disasters according to member country and Table 11 shows the make up of natural disasters within each Asian and ADRC member country.

In **Afghanistan** earthquake and flood made considerable impact on human sufferings

In **Bangladesh**, earthquake, extreme temperatures, floods, and windstorms occurred and almost all of these disasters caused considerable human suffering and loss of life. The most severe disaster was the flood in 2003. It is known that Bangladesh is a path for cyclones spawned in the Bay of Bengal, making the country prone to hydro-meteorological disasters.

In **China**, almost every type of disaster was recorded, as China encompasses a vast land with a population. The most severe disasters in China in the year 2003 were floods and windstorms followed by earthquake. Also, drought considerably affected the population. For 2003, the largest natural disaster in China in terms of affected population was flood.

East Timor also recorded floods and subsequent human sufferings.

The year 2003 brought the most disaster to **India,** where the most severe flood in Assam, Bihar and West Bengal states affected more than 7 million people. This was one of the most serious disasters in the year 2003. Windstorms also seriously affected the people. India is geographically located in a

natural disaster prone area that is affected by windstorms 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 drought happening in arid and semi arid areas.

Floods, earthquakes, droughts and slides were the disasters that most affected **Indonesia** in the year 2003. These were found to be the most serious disasters in terms of affected population. Since there are seismic belts running through the country, Indonesia is an earthquake prone country. Moreover there are 129 active volcanoes and volcanic eruptions often happen in the country. But 2003 did not record any disasters in relation to volcanic activity. Floods tend to occur along with windstorms in the rainy season in Indonesia.

The worst disaster in 2003 in terms of human loss occurred in **Iran.** The Bam Earthquake destroyed almost entire historical town of Bam and claimed the highest human loss by single disaster in the year 2003. More than 43,000 people died (Ministry of Interior in Iran estimates 26,200 of people killed) and 113,191 people were affected. The economic damage is also huge amounting to 1 billion US$.

In **Japan,** year 2003 was not good year as previous one in terms of damage. Earthquake in Hokkaido caused more than I billion US$ damage and affected more than 20,000 people. Floods and windstorms also caused considerable effect on the population.

Most of the natural disasters that occur in **Korea** are characterized as floods in the rainy season and windstorms. The year 2003 also recorded windstorm (Typhoon Maemi) in Korea, and the human suffering and economic loss caused by this were also quite high. Typhoon Maemi caused damage more than 5 billion US$, which was the highest damage caused by single disaster in the year 2003.

Almost 90% of the land of **Kyrgyz** is covered with mountains that are over 1,000 meters above sea level, and about 40% of the mountains are in alpine areas over 3,000 meters high. The distinctive natural disasters of Kyrgyz are earthquakes accompanied by active crustal deformation, floods caused by

snowmelt and landslides. In 2003, Kyrgyz also recorded slide disasters causing human sufferings.

In **Malaysia**, Floods and landslides caused by rainfall during the monsoon season, and rainstorms triggered by tropical low pressure often recorded. Year 2003 also recorded floods but the human loss and economic damage caused by these disasters was relatively small though the affected population by these disasters is considerably high.

Mongolia is a land locked country in Asia between Russia and China and major disasters are Zud, heavy snowfalls, sandstorms, floods, and so on. In the year 2003, Mongolia recorded floods which caused human suffering and economic damage.

Nepal is located in the Himalayan region where the Indian plate is wedging under the Eurasia plate and depending upon the crustal formation earthquakes frequently occur. Floods, slides, and extreme temperatures also often pose a threat to Nepal. Seen from the Table 11 in the year 2003, Nepal suffered significantly under floods, which caused heavy human loss and made many families *totally* affected which includes homeless, injured and affected.

Pakistan is often hit by drought, extreme temperatures, floods, slides and windstorms. In the year 2003, Pakistan's floods had caused reasonably large amounts of human suffering with more than 1.2 million affected people.

Papua New Guinea is also highly vulnerable to many kinds of natural disasters like earthquakes, tsunamis, volcanic activities, floods, and windstorms. Majority of the natural disasters that occurred in the year 2003 were hydro meteorological disasters with slides in contrast to 2002 and these disasters caused reasonable numbers of *totally* affected people. Human loss from these slides was also high in the Oceania region.

The Philippines is located on the Pacific Rim of Fire, making it vulnerable to natural disasters of both kind hydro meteorological and geo-physical type. As in the previous years, the damage caused by

hydro-meteorological disasters grew in 2003, with quite large populations affected by floods, slides and windstorms. Economic damage by windstorms and slides was also noticeable.

Russia has a vast area of land where disaster affected population and the economic losses are also noticeable. Droughts, earthquake, floods, wildfires and windstorms caused considerably large affected populations in the year 2003. Also, these types of disasters caused noticeable economic losses

Saudi Arabia also suffered by flood in 2003 causing more than 13,000 people affected.

Sri Lanka is located in the Indian Ocean just south of India and droughts in the dry seasons and windstorms, floods and subsequent landslides in the rainy seasons due to cyclones from the Bay of Bengal are the prime concerns of Sri Lanka. In 2003, Sri Lanka was hit severely by historical flood and landslides. The human loss and the affected population by these were considerably quite high. Number of this affected population was quite high in the region. Economic damage caused by this flood and landslide was also huge as it severely. Such human and economic loss triggered massive international assistance to that country in 2003.

Tajikistan's prime concerns are earthquakes and floods as mountains cover a majority of the land in Tajikistan. As such earthquakes and floods are the major threats to the country. But in 2003, slides and floods occurred in Tajikistan causing human sufferings and economic damages.

Thailand is highly prone to natural disasters because of its location and terrain. The northeastern area is prone to floods and droughts and the south has storms, floods and slides. Thailand was severely hit by these disasters in the year 2003, and population affected by hydro meteorological disasters was quite large.

Vietnam is located in the southeast monsoon climate area and the majority of the annual rainfall is in rainy season, which causes heavy human and economic loss every year. Epidemic, floods and windstorms caused severe human suffering and loss in Vietnam in 2003.

According to the above tables, it can be concluded that majority of ADRC member countries and the countries in the Asian region suffered from hydro-meteorological disasters, which inflicted heavy human and economic loss on society and hindered economic development. Further, the heavy effects of disasters on the population deprived people of socio-economic advancement thus slowing national and regional development. The most severe disasters in the world in 2003 were in the Asian region (Iran, China, Bangladesh, India, Sri Lanka, Thailand, Vietnam and Japan), affecting great number of people in the region. Hence, it is imperative to design and implement proper disaster mitigation and preparedness plans to reduce human and economic loss and human suffering, in order to contribute positively to global sustainable development.

4.3 Conclusions:

The year 2003 witnessed severe natural disasters occurred in the world The highest death toll came from Iran's Bam Earthquake, the highest affected population from the floods in China and the biggest economic damage from Korea Maemi Typhoon. Unexpectedly, Europe experienced severe high temperatures and heat wave which claimed heavy human loss and sufferings in the region. In the long run disaster data analysis, it is evident that the low income and low human development countries were affected much in terms of shares of human loss to population and damage to GNI. But the year 2003 showed that developed countries suffered much in terms of percentage of human loss to population. Upper middle income countries also suffered much with the damage in relation to GNI. This demonstrates that even developed countries cannot be complacent of their disaster reduction approaches and counter measures. It is also pointed out that continuous review of their disaster reduction strategies is imperative.

Though developing countries in regions vulnerable to disasters received many development initiatives and investments, the increasing frequency and magnitude of natural catastrophes associated with economic loss and human sufferings have considerably hindered those initiatives. This book has sought to derive conclusions from empirical evidence in order to integrate disaster risk management initiatives into development objectives. It can be seen in the preceding chapters that human development and income levels of a country are crucial determinants for deciding upon how to effectively implement risk management approaches and post disaster management initiatives. In addition, it was found that active and effective participation by women in risk management process is imperative for any meaningful disaster counter measures, especially in the least developed countries.

These generic 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 and also further investment for disaster reduction. This book also advocates the urgent need for specific country and regional initiatives to be integrated into cohesive disaster management approach with on going socio-economic development activities Since disasters impact every single socio-economic characteristics of a country, it can be concluded that designing development-oriented disaster prevention measures that incorporate the strength of human and economic resources would be an appropriate method of ensuring effective and pragmatic sustainable development.

Natural Disasters Data Book-2003
(An Analytical Overview)

March 2004

Edited by

Dr. SriGowri Sanker
Mr. Takuzo Ishii
Dr. Tetsushi Kurita
Ms. Maki Yoshida

Asian Disaster Reduction Center
Hitomiraikan 5F
1-5-2 Wakihamakaigan-dori
Chuo-ku, Kobe 651-0073
JAPAN
Tel: +81-78-262-5540 Fax: +81-78-262-5546
Website: http://www.adrc.or.jp
E-mail: rep@adrc.or.jp