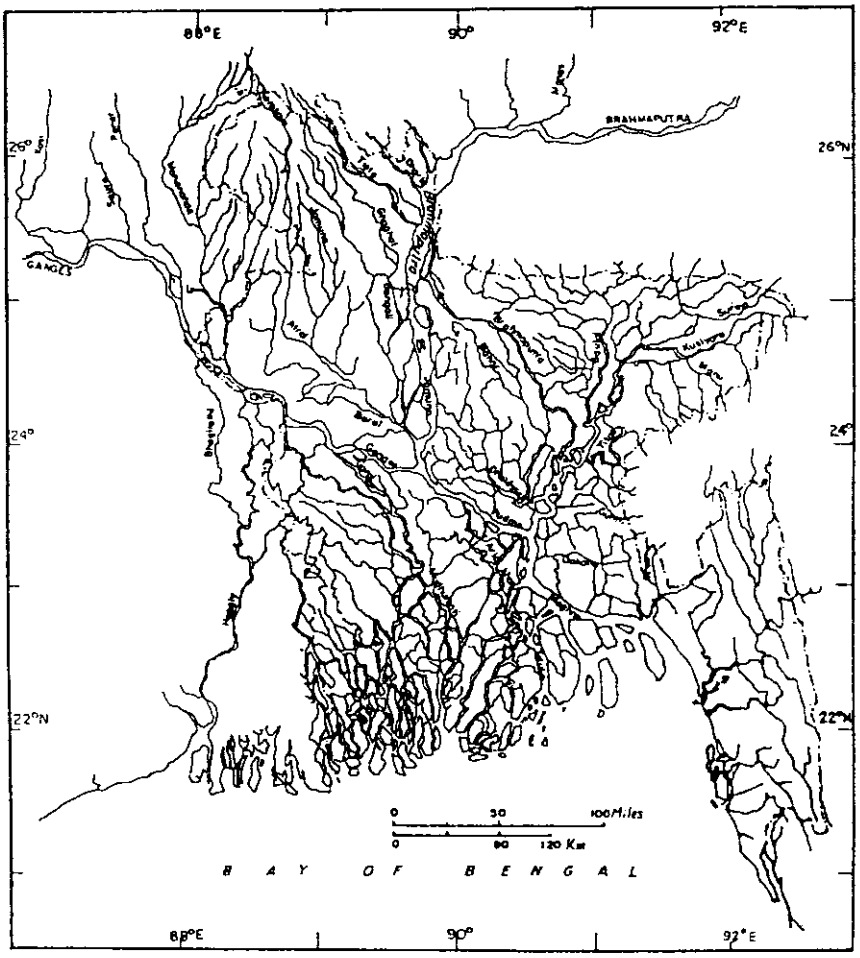
DISASTERS IN BANGLADESH

There has been an increasing trend of disasters in Bangladesh over the years because of the unabated increase in population, concentration in urban areas and active population migration to high risk areas. Bangladesh frequently experiences flood and cyclone disasters and, at times, disasters caused by tornadoes, droughts, riverbank erosion, earthquakes, etc. The country's vulnerability is apparent from Table 1 which lists the natural disasters during the last 350 years[4].



River network in Bangladesh

TABLE 1: MAJOR NATURAL DISASTERS IN BANGLADESH

Year	Types of Disaster	Deaths
1644-45	Floods	+
1648	Floods	+
1769-70	Drought	+
1783-84	Drought	+
1797	Cyclone	+
1822	Cyclone	40,000
1865-66	Drought in West Bengal, present Bangladesh largely escaped	135,000
1869	Earthquake	+
1873-74	Drought	+
1876	Cyclone	100,000
1885	Earthquake	+
1896-97	Drought	+
1897	Earthquake	+
1897	Cyclone	+
1898	Cyclone	175,000
1901	Cyclone	+
1906-07	Floods in East Bengal	+
1909	Cyclone (2)	+
1911	Cyclone	+
1917	Cyclone	+
1918	Earthquake	+
1919	Cyclone	+
1922	Cyclone	+
1923	Cyclone	+
1934	Earthquake	+
1941	Cyclone	+
1942	Cyclone	+
1943-44	Drought, irregular rain, transport dislocation and War, includes West Bengal	3,000,000
1950	Earthquake	+
1955	Floods	+
1960	Cyclone (2)	11,149
1961	Cyclone	11,468
1963	Cyclone	11,520
1964	Cyclone	196
1965	Cyclone	19,270
1966	Cyclone (2)	850
1969	Cyclone	75
1969	Tornado	922
1970	Cyclone	300,000
1972	Drought	+
1973	Cyclone (2)	103
1974	Cyclone	20
1974	Floods followed by famine	30,000
1975	Cyclone	5
1975	Floods	+
1977	Cyclone	+
1978-79	Drought	+
1981	Cyclone	2
1982	Drought	+
1983	Cyclone (2)	343
1984	Floods	+
1985	Cyclone	11,069
1986	Cyclone	14
1987	Floods	1,657
1988	Floods	2,379
1988	Cyclone	5,708
1989	Tornado	+
1989	Drought	+
1991	Cyclone	138,868

Source DCMU, Ali and Choudhury, 1992
\+ : No data found

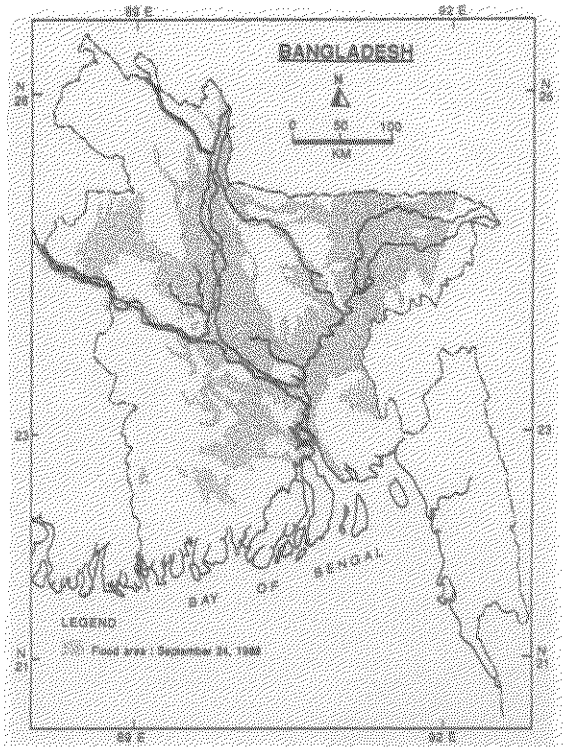
The occurrences of floods, cyclones, droughts, tornadoes, riverbank erosion, earthquakes and their impact on the socioeconomic condition of the country are described briefly:

2.1 FLOODS

Floods occur frequently and regularly in Bangladesh. Monsoon rains are the major cause of flooding. Other causes of floods include rapid runoff, effects of the confluences of the major rivers, flat topography of the delta and surges in the Bay of Bengal. Types of flooding in Bangladesh are:

- Flash floods - sharp rise and drop in water levels resulting in high-velocity flow causing damage to crops and property
- Rain floods - high-intensity rainfall over Bangladesh and surrounding areas
- Monsoon floods - overspilling of major rivers, usually slow rise, extensive damage occurs when the three major rivers rise at the same time
- Storm surge floods - arising from storm surges in the coastal areas.

Bangladesh has experienced flooding from time immemorial. Severe and extensive flooding in Bangladesh occurred in 1787, 1871, 1885, 1892, 1918, 1922, 1954, 1955, 1963, 1968, 1969, 1970, 1971, 1974, 1987 and 1988.



Devastating 1988 flood in Bangladesh (Source: SPARRSO)

2.2 CYCLONES

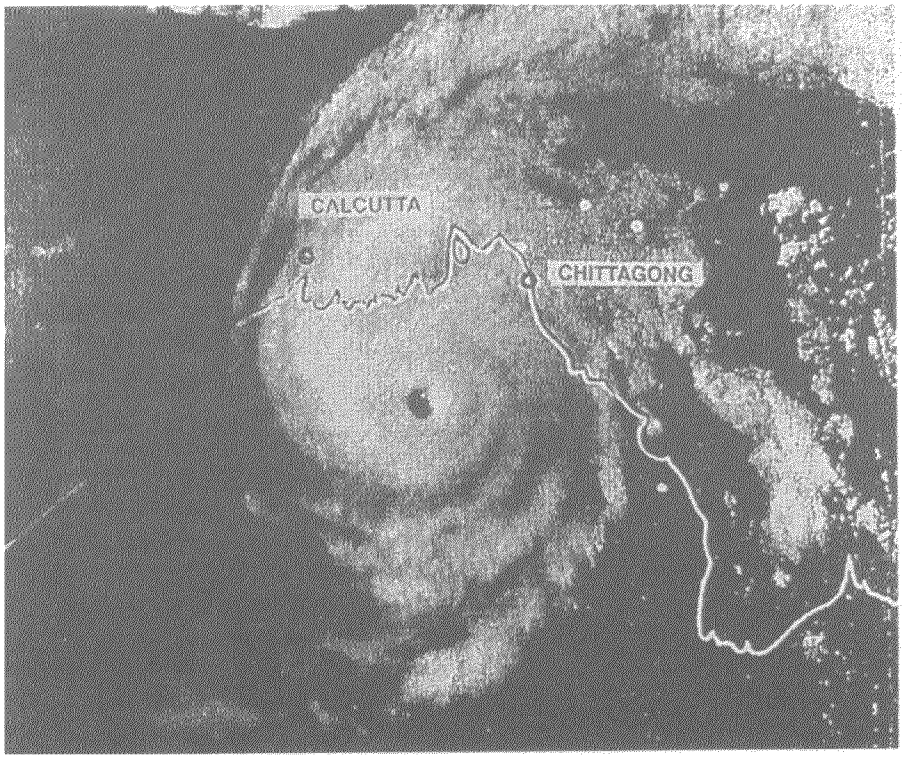
The term "cyclone" is derived from the Greek word "Kyklos" which means coil of snakes. Satellite imagery of cyclonic formation depicts a coil-of-snakes-like pattern. Every year, some eighty tropical cyclones occur around the world, four of which form in the Bay of Bengal. The formation, intensification and structure of tropical cyclones are related to six primary climatological parameters, namely[5, 6, 7]:

- Relative vorticity
- Coriolis parameter
- Vertical shear
- Ocean thermal energy sea surface temperature excess of about 26°C
- Vertical gradient of equivalent potential temperature
- Middle tropospheric relative humidity.

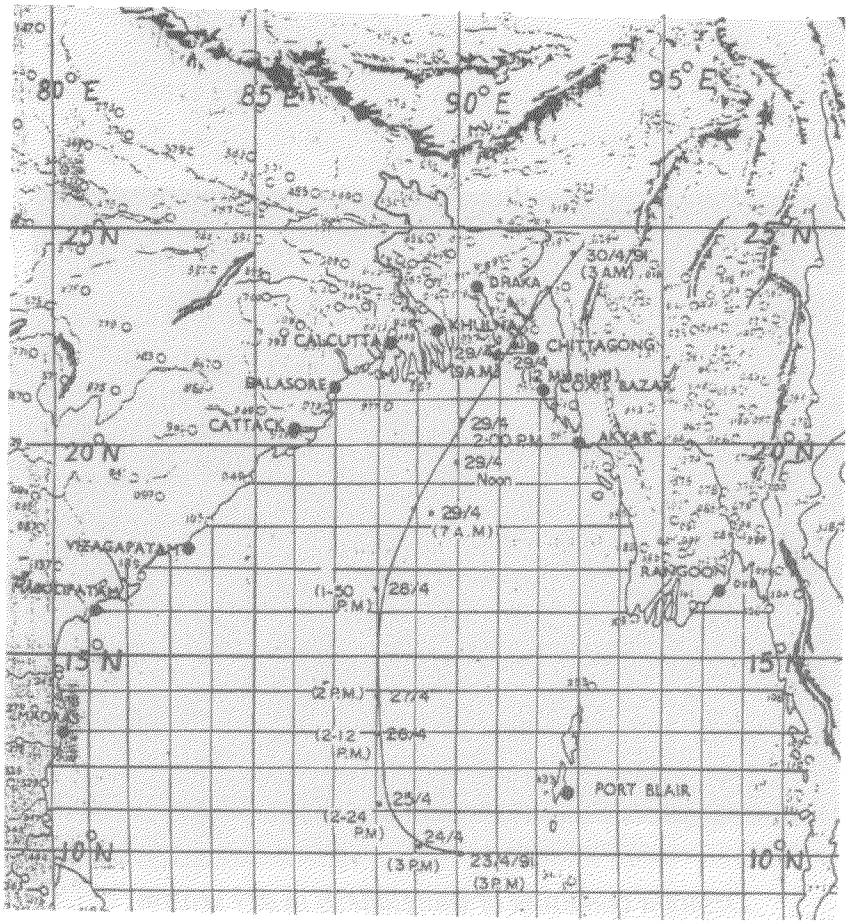
The Bay of Bengal is the breeding place of catastrophic cyclones during the pre-monsoon (April-May) and post-monsoon (September-December) periods. Cyclones in the Indo-Bangladesh sub-continent are classified according to intensity and the following nomenclature is used:

- Depression winds up to 62 km/hr
- Cyclonic storm winds between 63-87 km/hr
- Severe cyclonic storm winds between 88-118 km/hr
- Severe cyclonic storm of hurricane intensity wind above 118 km/hr.

Severe cyclones occurred in the Bay of Bengal and hit the coastal areas of Bangladesh in 1584, 1876, 1919, 1942, 1960, 1961, 1963, 1965, 1970, 1985, 1988, 1991 and 1994.



Satellite imagery of 29 April 1991 (Source: Kar, 1991)



The track of the 1991 cyclone (Source. SPARRSO)

2.3 DROUGHTS

A large area of Bangladesh, particularly in the northwest and southwest, is prone to drought. Drought-induced famines were major disasters in the past. Improved and increased irrigation facilities have considerably reduced the impacts of droughts. In a study on the aridity and drought conditions in Bangladesh, published in a Government of Bangladesh Report (1989), Choudhury and Hussain (1983) concluded that[8]:

- Although free from annual aridity condition, Bangladesh has seasonal aridity up to a maximum of 6 months in its northwestern part to a minimum of 4 months in its southwestern part. The percentages of area and population affected by maximum arid months in the northwestern part do not exceed 17.39% and 16.56%, respectively.
- Drought is a temporary, spatially irregular and non-periodic phenomenon affecting small parts of Bangladesh.
- Only less than 5% and 41-50% of the total area of Bangladesh can be affected by drought in about 7 to 8 years and 10 to 11 years, respectively.