



MONSOON MONITORING & EARLY WARNING

Issue 4/ 2008

22 July 2008

HIGHLIGHTS

- The risk of a large scale flood for the coming week is moderate. The low-lying areas of Zone 2, 3 and 4 (see map next page) have a relatively higher risk of flooding due to heavy to very heavy rains in the North of the country as well as in the upstream Indian states.
- As of the morning of the 22nd July 2008, eight FFWC (Flood Forecasting and Warning Center) river level monitoring stations were at or above danger level. Six other stations were at warning level or higher. All other 58 stations reported normal status.
- The Bangladesh Meteorological Department/ BMD recorded heavy to very heavy rains in the Northwest (Panchagarh, Nilphamari, Kurigram, Bogra, Sirajganj and Tangail) and the Northeast (Sylhet and Sunamganj) districts during the last two days. Heavy rains also fell upstream within the bordering Indian states of Assam, Meghalaya, West Bengal, Sikkim and Bihar.
- As of the morning of 22nd July, India's Central Water Commission was reporting six river stations upstream and not far from Bangladesh above danger level; three in Assam, two in Bihar and one in West Bengal. Twenty three other stations were at or above warning level; six in Assam, fifteen in Bihar and two in West Bengal.
- In comparison to last year (2007), river levels this year in Bangladesh have less frequently reached danger level during the period 1st June thru 21st July.

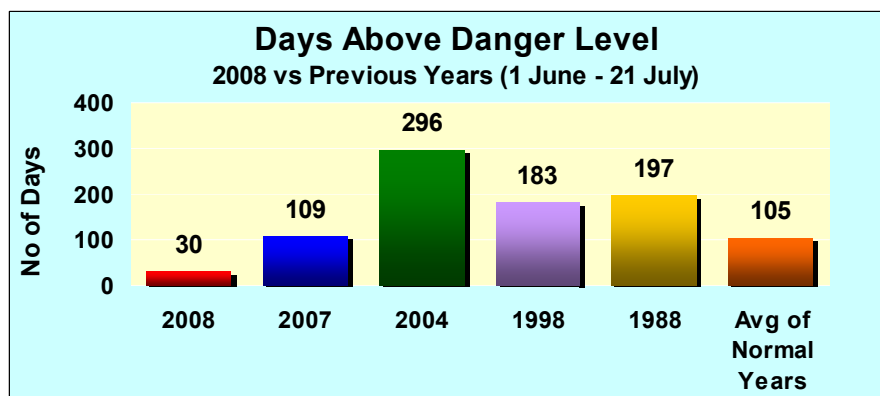
Historical Perspective Analysis: 2008 River Levels vs Previous Years

Each of the river level monitoring stations of Bangladesh's Flood Forecasting and Warning Center/ FFWC has its own designated "danger level". The number of days rivers flow at or above danger level at these stations can serve as a useful indicator for flood monitoring. The following analyses, conducted for the period 1st June thru 21st July for 26 key monitoring stations North of Dhaka, focuses on the following questions:

How many days have water levels been at or above danger level for 2008?

How does 2008 compare with the previous "mega flood years" of 2007, 2004, 1998, & 1988?

How does 2008 compare with the "normal years"?



The graph above shows relatively few days (30 during 2008) when rivers reached danger level for the stations considered. In comparison, during last year (2007), there were many more days (109) when these same rivers touched danger level or higher. Readers should be aware that results presented above, represent only a snap-shot in time (i.e., for the period 1 June thru 21 July). Using the FFWC data, WFP will update this analysis weekly through the 2008 Monsoon season. Results will change significantly (i.e., the inter year comparisons) as the season progresses. It is interesting to note that the bar above representing "Avg. of Normal Years" varies little from the past "Mega Flood Year" of 2007. This is because the high counts (number of days above danger level) associated with the flood in 2007 only manifested themselves during late July, August and September.

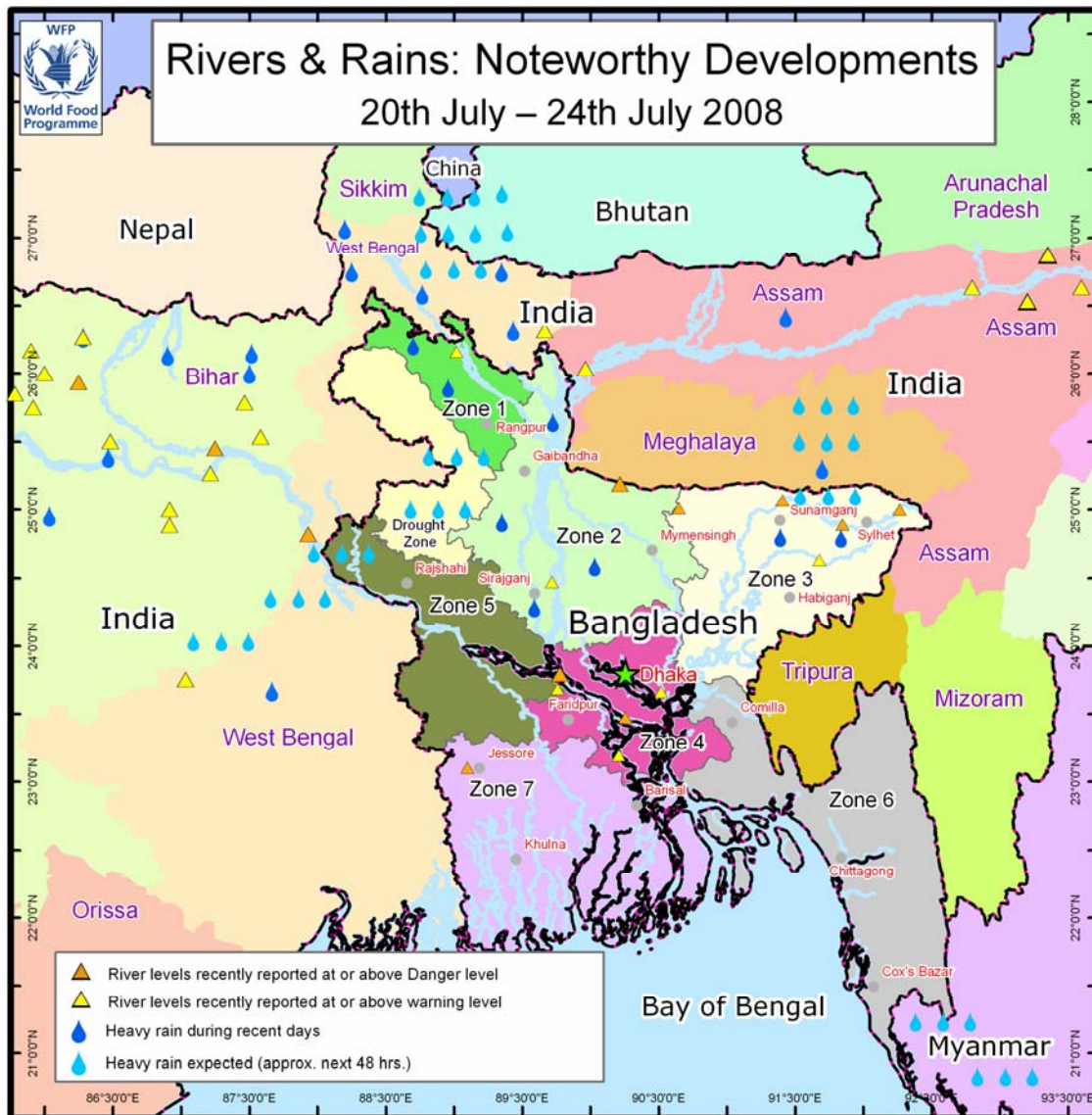
Note: 1) Period considered: 1st June thru 21st July, (2) Normal Years: 1986, 1987, 1989-1997, 1999-2003, 2005, 2006
3) Mega Flood Years: 2007, 2004, 1998, 1988, (4) Analysis based on 29,172 (26 x 51 x 22) river level observations during previous years.

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Monsoon 2008: Situation Map




- Within Bangladesh, eight FFWC river monitoring stations, within the districts of Sylhet, Sunamganj, Netrokona, Sherpur, Munshiganj, Rajbari and Jessore, are presently at or above danger level as of the morning of 22nd July. Six other stations are at or above warning level, while the remaining 58 stations reported normal status.
- Upstream, in the neighboring Indian states of Assam, West Bengal and Bihar, six stations were above danger level, as of the morning of 22nd July 2008. Twenty three additional stations were at or above warning level, six in Assam, fifteen in Bihar and two in West Bengal (Note: not all stations are shown in the map above because of the map frame used).
- Heavy to very heavy rains fell in the Northwest (Panchagarh, Nilphamari, Kurigram, Bogra, Sirajganj and Tangail) and Northeast (Sylhet and Sunamganj) districts during the last two days. Heavy rains also fell upstream within the bordering Indian states of Assam, Meghalaya, West Bengal, Sikkim and Bihar.
- Heavy to very heavy rains are expected during the next 48 hours in the Northeast (near Sylhet and Sunamganj) and the Northwest (north of Rajshahi). Similar rain is also expected in West Bengal, Sikkim, Assam, Meghalaya and in parts of Nepal and Bhutan.

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Flood Risk Analysis

	Districts	River Basin	Heavy Rainfall events last 2 days (within zone)	Heavy Rainfall events last 2 days (upstream Basin)	River Levels (within zone)	River Levels (upstream basin)	Rainfall Forecast (next 48 hours)	Overall Flood Risk
Zone 1 North West	Panchagarh Nilphamari Lalmonirhat Rangpur	Tista	M	H	L	L	H	Medium
Zone 2 North Central	Kurigram Gaibandha Jamalpur Sherpur Bogra Sirajganj Mymensingh Tangail	Brahmaputra/ Jamuna	H	L	L	H	H	High
Zone 3 North East	Sylhet Sunamganj Netrokona Kishoreganj Habiganj Moulavibazar Narsingdi Brahmanbaria	Meghna	M	L	H	L	H	High
Zone 4 Central	Dhaka Gazipur Manikganj Munshiganj Narayanganj Faridpur Madaripur Shariatpur Chandpur	Convergence of Brahmaputra, Padma and Meghna	L	M	M	M	L	High
Zone 5 West Central	Rajshahi Nawabganj Natore Pabna Kushtia Meherpur Chuadanga Jhenaidah Magura Rajbari	Padma/ Ganges	L	L	L	H	H	Medium
Zone 6 South East	Comilla Lakshmipur Noakhali Feni Chittagong Khagrachari Rangamati Bandarban Cox's bazar	Lower Meghna	L	L	L	H	M	Low
Zone 7 South West	Jessore Narail Gopalganj Satkhira Khulna Bagerhat Pirojpur Barisal Jhalokati Patuakhali Barguna Bhola	Coastal	L	L	L	M	L	Low

Methodology Used for Flood Risk Analysis (see table previous page)

Five simple indicators were used to estimate flood risk for seven zones within Bangladesh (see small inset map p-3). The indicators used are :

- (a) Heavy rainfall events during the last 2 days within the zone.
- (b) Heavy rainfall events during the last 2 days upstream from the zone
- (c) River levels within the zone
- (d) River levels upstream from the zone (either outside Bangladesh or inside)
- (e) Rainfall forecast/expected within approximately the next 48 hours.

The threshold used for defining “heavy” rainfall was 70 mms or more within a 24 hour period. Regarding river levels, only those cases where rivers were “at warning level or above”, were considered. The amount of rainfall expected/ forecast varied both across and within zones. Some areas are expected to receive as little as 30-40 mms total in the coming days, while others are forecast to receive 100 mms or more. A value of “low” in the table on page 3 will be closer to the low end on this range, a value of “high” will be closer to the high end.

All 5 indicators were used as inputs to determine “overall flood risk”. In order of importance, more consideration was given to “river levels within the zone”, moderate importance was given to river levels upstream and to recent rainfall upstream. Relatively lower consideration was given to rainfall in the zone and to the rainfall forecast.

Data and Information Sources**Rainfall Recent Past:**

BMD/ Bangladesh Meteorological Department

FFWC/ Flood Forecasting and Warning Center: <http://www.ffwc.gov.bd/>

IMD/ Indian Meteorological Department: <http://www.imd.gov.in>

NASA TRMM/ Tropical Rainfall Measuring Mission: http://trmm.gsfc.nasa.gov/publications_dir/potential_flood.html

Rainfall Forecast:

CPC/ Climate Prediction Center: <http://www.cpc.ncep.noaa.gov>

IMD/ Indian Meteorological Department: <http://www.imd.gov.in>

River Levels:

FFWC/ Flood Forecasting and Warning Center: <http://www.ffwc.gov.bd/>

CWC/ Central Water Commission, India: <http://www.india-water.com/ffs/index.htm>

- Note:** 1. This Bulletin is available at WFP Bangladesh website at <http://bangladesh.wfp.org> and LCG DER Website at <http://www.lcgbangladesh.org/derweb/index.php>
2. Comments on this bulletin should be sent to hewhr.bangladesh@wfp.org