



MONSOON MONITORING & EARLY WARNING

Issue 11/ 2008

9 September 2008

HIGHLIGHTS

- The risk of significant new flooding for the coming days is low to moderate.
- At sub-national scale; flood risk is higher for the Central region.
- As of this morning, eighteen FFWC river level monitoring stations were at or above danger level and fourteen were at warning level or higher. Out of a total of 73 stations, 18 reported rising trends, 51 falling, and 4 steady.
- As of mid-day, India's Central Water Commission was reporting four river stations upstream and not far from Bangladesh above danger level; one in each of the states of Assam, Bihar, West Bengal, and Jharkhand. Twenty four other stations were at or above warning level; thirteen in Assam and eleven in Bihar.
- In comparison to last year (2007), river levels this year in Bangladesh have less frequently reached danger level during the period 1st June thru 8th September.

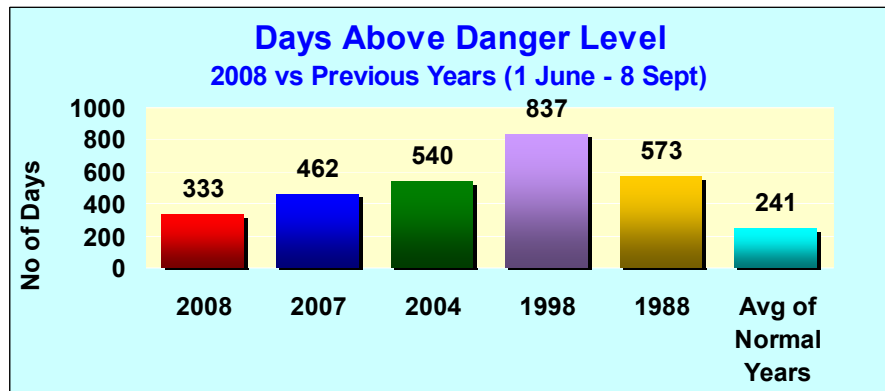
Historical Perspective Analysis: 2008 River Levels vs Previous Years

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 8th September 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 fewer days (333 during 2008) when rivers reached danger level for the stations considered. In comparison, during last year (2007), there were many more days (462) 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 8 September). 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 noticeable that the number of days rivers reached danger level in 2008 is above the average of normal years but significantly below the number in 2007. This clearly indicates a relatively lower risk of flooding in comparison to last year.**

Note: 1) Period considered: 1st June thru 8th Sept,

(2) Normal Years: 1986, 1987, 1989-1997, 1999-2003, 2005, 2006

3) Mega Flood Years: 2007, 2004, 1998, 1988,

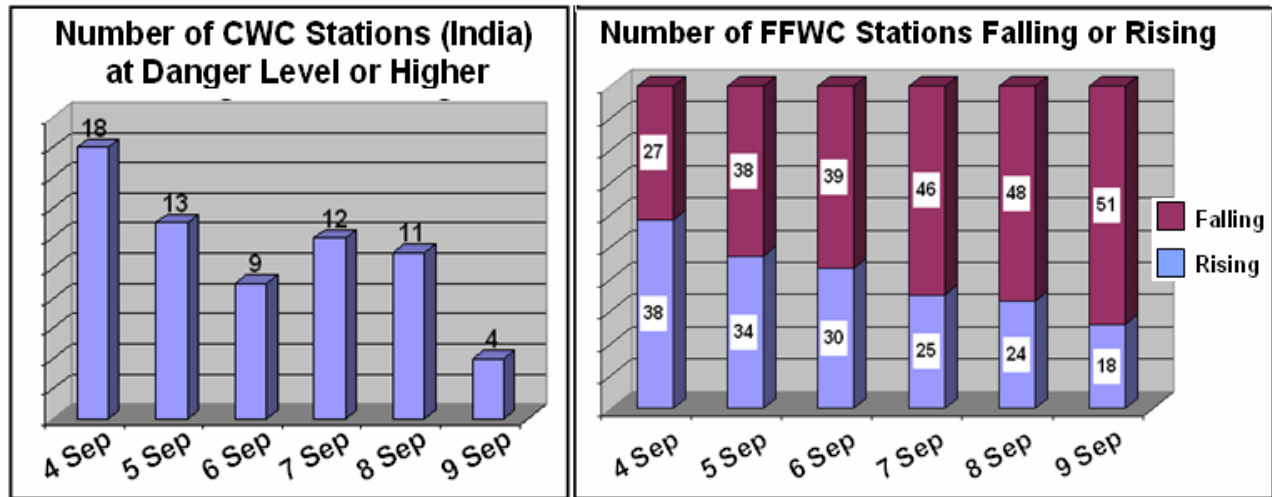
(4) Analysis based on 57,200 (26 x 100 x 22) river level observations during previous years.

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River Level Analysis; Within Bangladesh and Upstream



- The graph above (left) shows the number of stations at or above danger level in the Up-Stream basin within the neighboring Indian States of Assam, Bihar, Jharkhand, W. Bengal, and Uttar Pradesh. A decreasing trend is clearly observed during the recent period.
- The graph on the right shows that in recent days, the number of FFWC “falling” stations is clearly increasing whereas the number of “rising” stations is clearly decreasing.

Flood Situation and Humanitarian Response

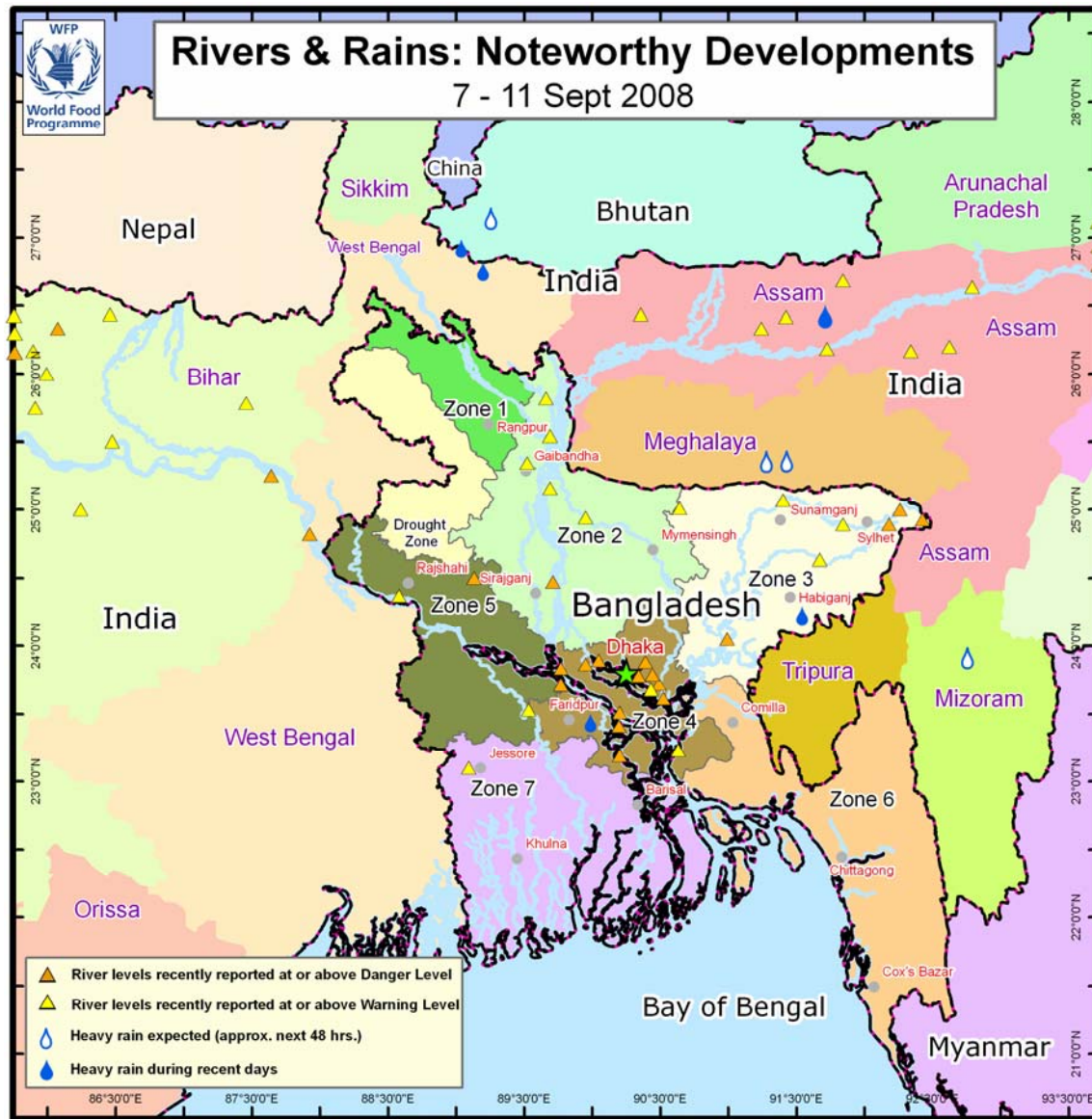
- Situation reports from WFP field Sub-Offices, GoB’s Disaster Management Bureau DMIC and FFWC indicate that a total of 17 districts (Kurigram, Gaibandha, Jamalpur, Serajganj, Manikganj, Munshiganj, Faridpur, Rajbari, Shariatpur, parts of Dhaka, Nawabganj, Madaripur, Bogra, Tangail, Chandpur, Sylhet and Sunamganj) are amongst the most flood affected.
- WFP Sub-offices along with other humanitarian agencies are closely monitoring the situation at the ground level and maintaining a close contact with the GoB district/ upazila administration as well as standby NGO partners. The general consensus is that the overall flood situation in most of the places is improving. River levels have fallen significantly during the last few days.
- According to field reports, people living on the river side of embankments and low-lying char areas are mainly affected. Damaged assets include crops, houses, roads, embankments, bridges/culverts, and educational institutions. Affected people in a few districts are residing in flood shelters.
- The job opportunities for the daily laborers have seriously been hampered. Rice and other food commodities are available in the market but there is limited accessibility for the victims due to high price and limited income. Drinking water is a priority in affected areas.
- The Government of Bangladesh has allocated G.R. Rice (100-250 MT each), G.R. Cash (BDT 50K-250K each) and House Building Grant (BDT 50K-250K each) for each of the affected districts. The local district administrations are continuing relief distribution from their standby reserves of food and cash.
- The Government of Bangladesh has also decided to allocate 50,000 MT of rice/ food grains which will be used for food for work type interventions (Test Relief) to maintain/repair affected/ damaged roads, educational institutions and public welfare infrastructure.
- WFP has pre-positioned High Energy Biscuits ready for immediate distribution to most affected districts if the situation deteriorates. Other humanitarian agencies are also stepping up preparedness efforts.
- GoB District and Upazila Disaster Management Committees (DMCs) are convening regular meetings to discuss the present flood situation.

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Monsoon 2008: Situation Map




- Within Bangladesh, eighteen FFWC river monitoring stations, in the districts of Sylhet, Kishoreganj, Bogra, Serajganj, Manikganj, Madaripur, Munshiganj, Dhaka, Narayanganj, Rajbari and Shariatpur are presently at or above danger level. Fourteen other stations are at or above warning level, while the remaining 41 stations reported normal status.
- Upstream, in the neighboring Indian states of Assam, Bihar, West Bengal and Jharkhand, four stations were above danger level. Twenty four were at or above warning level; thirteen in Assam and eleven in Bihar (Note: not all stations are shown in the map above because of the map frame used).
- Heavy rain (70 mms or more in a day) recently fell within Bangladesh in the districts of Habiganj and Faridpur as well as in the upstream neighboring Indian states of Assam and West Bengal.
- Light to moderate rains are expected during the next 48 hours in the Northern districts of Kurigram, Sunamganj and Sylhet and Southeast districts of Bandarban and Rangamati. Outside Bangladesh, light to moderate rain is expected in the upstream Indian states of Assam, Meghalaya, West Bengal, Bihar and in 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	L	L	L	L	L	Low
Zone 2 North Central	Kurigram Gaibandha Jamalpur Sherpur Bogra Sirajganj Mymensingh Tangail	Brahmaputra/ Jamuna	L	M	M	M	M	Medium
Zone 3 North East	Sylhet Sunamganj Netrokona Kishoreganj Habiganj Moulavibazar Narsingdi Brahmanbaria	Meghna	L	L	M	L	M	Medium
Zone 4 Central	Dhaka Gazipur Manikganj Munshiganj Narayanganj Faridpur Madaripur Shariatpur Chandpur	Convergence of Brahmaputra, Padma and Meghna	L	L	H	M	L	High
Zone 5 West Central	Rajshahi Nawabganj Natore Pabna Kushtia Meherpur Chuadanga Jhenaidah Magura Rajbari	Padma/ Ganges	L	L	L	M	L	Low
Zone 6 South East	Comilla Lakshmipur Noakhali Feni Chittagong Khagrachari Rangamati Bandarban Cox's bazar	Lower Meghna	L	M	L	H	M	Medium
Zone 7 South West	Jessore Narail Gopalganj Satkhira Khulna Bagerhat Pirojpur Barisal Jhalokati Patuakhali Barguna Bhola	Coastal	L	L	L	M	L	Low

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Methodology Used for Flood Risk Analysis (see matrix 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 10-20 mms total in the next 2-3 days, while others are forecast to receive as much as 50 mms. A value of “low” in the table on page 4 will be closer to the low end of this range, a value of “medium” 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>

Flood Situation and Humanitarian Response:

WFP Bangladesh Sub-Offices and GoB DMB Disaster Management Information Center (DMIC)

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