Weekly Flood Situation Report for the Mekong River Basin
Prepared on: Monday, 03/08/2009, covering the week from 27th July to 3rd August 2009

Weather Patterns, General Behavior of the Mekong River and Flood Situation

General weather patterns
During the week of Monday 27th July – Monday 3rd August 2009, six weather bulletins have been issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the July 31st and August 2nd bulletins are presented in the figures below.

Moderate monsoon developed to strong South-West (SW) monsoon
During July 27th – August 1st, 2009, the moderate SW monsoon prevailed (Figure 1) and starting from 2nd August it developed into strong SW monsoon (Figure 2).

ITCZ (Inter Tropical Convergence Zone)
During August 2, 2009, the Inter Tropical Convergence Zone (ITCZ) lied across Myanmar, Thailand, Lao PDR, Northern Viet Nam, Hainan Island and Northern Philippine, connected with the Tropical Depression (Figure 2).

Tropical depressions, tropical storms or typhoons
The TD with central pressure 992 hPa located at latitude 18°5 N, longitude 116°0 E, over South China Sea, between Hainan Island and NW of the Philippines, is moving slowly to NW, maximum wind speed in the central of TD is 56 km/hr (Figure 2).

Other weather phenomena that affect the discharge
No other weather phenomena affecting the discharge were observed

Overall weather situation
Normal weather situation lasted from July 27th until 2nd August 2009. Big thunderstorm and heavy rain was observed in Thailand and Northern Viet Nam. The thunderstorm and light rain was observed over Cambodia, Lao PDR and Southern Viet Nam.
General behavior of the Mekong River

- There is some inconsistency of water levels along the Mekong River. While water levels in the upper reach of Lower Mekong River are below the long-term average, water levels in the middle reach are about average and in the lower reach water levels are above the long-term average. Water levels at Tan Chau and Chu Doc are rising towards the warning levels which are a common situation for this time of the year.

For stations from Chiang Saen to Chiang Khan

Water levels were more or less stable and are below the long-term average for this time of the year.

For stations from Vientiane / Nongkhai to Paksane

Water levels were slightly decreasing towards the end of the week and are below the long-term average for this time of the year.

For stations from Nakhon Phanom to Pakse

Water levels were dropped at the mid of the week and then rose up towards the end of the week. Most are somewhat moving around the long-term average for this time of the year.

For stations from Stung Treng to Phnom Penh

Water levels were rising steadily towards the end of the week and are above the long-term average for this time of the year.

Downstream of Phnom Penh

Water levels were rising steadily towards the end of the week. Most are somewhat above the long-term average for this time of the year except at Tan Chau and Chau Doc where the water levels are at the long-term average for this time of the year.

Note: For areas between forecast stations please refer to the nearest station.

Flood Situation

- Flood stage or alarm stage:

  No alarm stage (where the forecast is expected to reach flood level within three days) was reported anywhere in the Mekong River Basin during the past week. Water levels at some stations in the Cambodian floodplains and delta are just 1-2 metres below the flood levels (as defined by the national agencies).

- Damage or victims:

  No damage and no loss of life due to river flooding was recorded anywhere in the Mekong River Basin during the past week.

For more details see the following annex:

- tables and graphs for water level and rainfall for the last week in Annex A
- a graph for accuracy in Annex B
- a table of forecast achievement in Annex B
- tables and graphs for performance in Annex B
- the water level graphs showing the observed water level for the season in Annex C
## Annex A: Graphs and Tables

### Table A1: observed water levels

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### Table A2: observed rainfall.

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Flood level: 11.80, 18.00, 17.40, 12.50, 12.20, 14.50, 12.70, 14.00, 12.60, 13.00, 16.20, 12.00, 23.00, 16.20, 12.00, 11.00, 7.90, 8.00, 10.00, 4.20, 3.50

Unit in mm
Figure A1: Water level and rainfall for Jinghong, Chiang Saen, and Luang Prabang
Figure A2: Water level and rainfall for Chiang Khan, Vientiane, Nongkhai, and Paksane
Figure A3: Water level and rainfall for Nakhon Phanom, Thakhek, Mukdahan and Savannakhet
Figure A4: Water level and rainfall for Khong Chiam, Pakse, Stung Treng, and Kratie
Figure A5: Water level and rainfall for Kampong Cham, Phnom Penh (Bassac and Port), and Koh Khel
Figure A6: Water level and rainfall for Neak Luong, Prek Kdam, Tan Chau and Chau Doc
Annex B: Accuracy and performance

Accuracy

“Accuracy” describes the accuracy of the adjusted and published forecast, based on the results of the MRC Mekong Flood Forecasting System, which are then adjusted by the Flood Forecaster in Charge taking into consideration known biases in input data and his/her knowledge of the response of the model system and the hydrology of the Mekong River Basin. The information is presented as a graph below, showing the average flood forecasting accuracy along the Mekong mainstream.

The graph of average difference between forecast and actual levels for the past week deviates from the normal pattern, in which the accuracy is better in the upper reach of Mekong River where it is usually less accurate.

Significantly high differences were seen at stations from Nakhon Phanom to Kratie due to continuous rainfall over the past week since 29 July on the left bank tributaries of Lao PDR as those could not be estimated well by the Satellite Rainfall Estimates (SRE). For example, during 29 July to 1 August SRE underestimated rainfall at Mahaxai (upstream tributary of Mukdahan/Savannakhet) and Khong Sedone (upstream tributary of Pakse) by nearly 50% thereby reducing accuracy at stations downstream of Mukdahan/Savannakhet.

Figure B1: Average flood forecast accuracy along the Mekong mainstream.
Forecast Achievement

The forecast achievement indicates the % of days that the forecast at a particular station for a lead-time is successful against a respective benchmark (Table B2).

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<td>100.0</td>
<td>28.6</td>
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</table>

Table B2: Benchmarks of success (Indicator of accuracy in mean absolute error) Unit in cm

<table>
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<tr>
<th>Station</th>
<th>1-day</th>
<th>2-day</th>
<th>3-day</th>
<th>4-day</th>
<th>5-day</th>
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<td>100</td>
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<tr>
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<td>75</td>
<td>75</td>
<td>100</td>
<td>100</td>
</tr>
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</table>

Note: An indication of the accuracy given in the Table B2 is based on the performance of the forecast made in 2008 from the new flood forecasting system and the configuration for the 2009 flood season and is published on the website of MRC (http://ffw.mrcmekong.org/accuracy.htm).

In the future these indicators will be adjusted against a set of performance indicators that is established by combining international standards and the specific circumstances in the Mekong River Basin. An expert mission to establish these performance indicators is planned for the fourth quarter of 2009.
Monday, 3rd August 2009

**Performance**

Performance is assessed by evaluating a number of performance indicators, see table and graphs below:

Table B3: Overview of performance indicators for the past 8 days including the current report date

<table>
<thead>
<tr>
<th></th>
<th>Flood Forecast: time sent</th>
<th>Arrival time of input data (average)</th>
<th>Missing data (number)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FF completed and sent (time)</td>
<td>FF2 completed and sent (time)</td>
<td>Weather information available (number)</td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>week</td>
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<td>1</td>
<td>11:38</td>
</tr>
<tr>
<td>month</td>
<td>10:37</td>
<td>13</td>
<td>12:39</td>
</tr>
<tr>
<td>season</td>
<td>10:41</td>
<td>26</td>
<td>12:39</td>
</tr>
</tbody>
</table>

*Week* is the week for which this report is made; *Month* is actually the last 30 days (or less if the flood season has just begun); *Season* is the current flood season up to the date of this report.

Figure B2: Data delivery times for the past 8 days including the current report date
**Data Delivery - Missing Data**

![Graph showing missing data for the past 8 days including the current report date](image)

Figure B3: Missing data for the past 8 days including the current report date

**Flood Forecast - Completion Time**

![Graph showing flood forecast completion time](image)

Figure B4: Flood forecast completion time

**Flood Forecast - Stations without Forecast**

![Graph showing stations without forecast](image)

Figure B5: Flood forecast stations without forecast

**Flood Forecast - Second Forecast Needed**

![Graph showing second forecast needed](image)

Figure B6: Second forecast needed

**Note:** On 30 July 2009 the forecasting team could not access to the Hydromet data due to an internal problem with the internet gateway router device and as a result the forecast completion time was later than usual. On 31 July 2009 there was another internal trouble with the forecasting server that caused the late forecast completion time. The first forecast on 30/07 was made without rainfall input from NOAA and later on after the data could be accessed the second forecast was made. The second forecast on 01/08 was made to update the forecast at Nakhon Phanom after the data was arrived.
Annex C: Season Water Level Graphs

This Annex has the water level graphs of the report date. These graphs are distributed daily by email together with the Flood Bulletins.
Water level at 7am of Mekong at Kompong Cham

Water level at 7am of Bassac at Phnom Penh

Water level at 7am of Tonle Sap at Phnom Penh Port