Weekly Flood Situation Report for the Mekong River Basin

Prepared on: 02/07/2012, covering the week from the 25th June to the 01st July 2012

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

General weather patterns

During the week of the 25th June to 01st July 2012, three weather bulletins were issued by the Department of Meteorology (DOM) of Cambodia. The weather charts of the 25th June and 29th June bulletins are presented in the figures below:

South-West (SW) Monsoon

Moderate to strong SW monsoon prevailed over Amanda Sea and the Gulf of Thailand in last week (Figure 1and 2).

Inter Tropical Convergence Zone (ITCZ)

No Inter Tropical Convergence Zone (ITCZ) was observed during the reporting period.

Tropical depressions (TD), tropical storms (TS) or typhoons (TY)

The Tropical Storm (TS) DOKSURI (1206), which was formed in the Philippine on 27 June, located in the South China Sea at latitude 22° N and longitude 112.8° E with maximum sustained wind about 65 kilometres per hour (Figure 2). The TS moved West North-west ward and landed over China territory on 30th June.

Other weather phenomena that affect the discharge

No other weather phenomena affecting the discharge were observed.

Over weather situation

Normal weather lasted the LMB in last week. As a result of strong SW monsoon appearances as well as storm DOKSURI influences, moderate to heavy rain occurred in the East and the Central of Thailand, the North and the Central of Lao PDR and Vietnam, in the East, Northeast and the Central of Cambodia. Figure 3 illustrates rainfall amount distribution over the LMB, covering 27 June – 2 July,
in which heavy rain concentrated in the upper part from Luang Prabang to Paksanse, in the middle part of LMB from Khong Chiam to Pakse.
For stations from Chiang Saen to Vientiane/ Nong Khai
Water levels were more-or-less stable with slightly falling trend in last week. These stations were recording levels that are below the long-term average for this time of the year.

For stations from Paksane to Pakse
Water levels showed a falling trend during week. These stations were recording levels that are somewhat below the long-term average for this time of the year.

For stations from Stung Treng to Kampong Cham
Water levels at these stations were more-or-less stable during the week and somewhat around the long-term average for this time of the year.

For stations from Phnom Penh to Koh Khel/Neak Luong
Water levels were more or less stable with slightly falling trend toward the end of the week. Most stations were recording levels that are somewhat below the long-term average for this time of the year.

Tan Chau and Chau Doc
Water levels showed a rising in last week. Both stations were recording levels that are below the long-term average for this time of the year and significantly affected by tidal.

Note: for areas between forecast stations, please refer to the nearest forecast 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 on the mainstream of the Mekong River during the past week. Water levels are still significantly below flood levels (as defined by the national agency) at all forecast stations.

- Damage or victims:
  No damage or loss of life due to river flooding was recorded anywhere along the Mekong River 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

| Date   | Jinghong | Chiang Saen | Luang Prabang | Chiang Khan | Vientiane | Nongkhai | Pakse | Pakse (Nakhon Phanom) | Pakse (Suranakhet) | Khong Chiam | Pakse (Cham) | Pakse (Mekong) | Pakse (Stung Treng) | Kraie | Kompeng (Cham) | Kompeng (Phnom Penh (Bassac)) | Kompeng (Phnom Penh (Port)) | Koh Khel | Neak Luong | Prek Kdam | Tan Chau | Chau Doc |
|--------|----------|-------------|---------------|-------------|-----------|----------|-------|------------------------|---------------------|-------------|--------------|----------------|----------------|----------------|-------|---------------|---------------------------------|--------------------------------|--------|-----------|----------|--------|---------|
| 25/06  | 535.97   | 2.60        | 4.68          | 4.87        | 2.35      | 3.03     | 5.51  | 4.66                    | 5.85                | 5.26        | 4.11        | 6.28         | 5.07            | 5.21         | 7.60  | 4.23         | 3.25                          | 3.84                          | 2.84  | 3.28      | 0.74      | 0.41   |
| 26/06  | 534.71   | 2.58        | 4.79          | 4.49        | 2.19      | 2.74     | 5.48  | 5.01                    | 6.22                | 5.32        | 4.18        | 6.21         | 4.98            | 5.18         | 12.44 | 7.43         | 4.16                          | 3.26                          | 3.79  | 2.84      | 0.74      | 0.45   |
| 27/06  | 534.71   | 2.64        | 4.74          | 4.42        | 1.82      | 2.46     | 5.14  | 4.84                    | 6.04                | 5.30        | 4.19        | 6.08         | 4.86            | 5.10         | 12.35 | 7.32         | 4.10                          | 3.21                          | 3.73  | 2.72      | 0.69      | 0.43   |
| 28/06  | 534.69   | 1.87        | 4.66          | 4.62        | 1.67      | 2.26     | 4.83  | 4.41                    | 5.62                | 4.94        | 4.22        | 5.99         | 4.75            | 5.01         | 12.23 | 7.24         | 4.05                          | 3.17                          | 3.68  | 2.59      | 0.71      | 0.48   |
| 29/06  | 534.71   | 1.73        | 4.62          | 4.76        | 1.72      | 2.25     | 4.81  | 4.02                    | 5.23                | 4.48        | 4.26        | 5.68         | 4.50            | 5.01         | 12.09 | 7.13         | 3.99                          | 3.11                          | 3.65  | 2.68      | 0.83      | 0.63   |
| 30/06  | 534.70   | 1.66        | 4.24          | 4.72        | 1.75      | 2.34     | 4.52  | 3.70                    | 4.94                | 4.10        | 5.26        | 4.35         | 4.96            | 12.19        | 7.07  | 3.93         | 3.05                          | 3.59                          | 3.68  | 3.02      | 1.11      | 1.00   |
| 01/07  | 534.71   | 1.63        | 3.82          | 4.63        | 1.86      | 2.40     | 4.55  | 3.58                    | 4.84                | 4.88        | 4.00        | 4.97         | 12.14          | 7.14         | 3.97  | 3.10         | 3.63                          | 2.62                          | 3.05  | 1.21      | 1.19      | 1.19   |
| 02/07  | 534.72   | 1.64        | 3.70          | 4.48        | 1.82      | 2.38     | 4.70  | 3.81                    | 5.00                | 4.04        | 2.88        | 4.68         | 3.86            | 4.99         | 12.25 | 7.18         | 4.01                          | 3.14                          | 3.67  | 2.62      | 1.34      | 1.35   |

**Unit in m**

| 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 | 16.20 | 12.00 | 11.00 | 7.90 | 8.00 | 10.00 | 4.20 | 3.50 |

#### Table A2: observed rainfall

| Date   | Jinghong | Chiang Saen | Luang Prabang | Chiang Khan | Vientiane | Nongkhai | Pakse | Pakse (Nakhon Phanom) | Pakse (Suranakhet) | Khong Chiam | Pakse (Cham) | Pakse (Mekong) | Pakse (Stung Treng) | Kraie | Kompeng (Cham) | Kompeng (Phnom Penh (Bassac)) | Kompeng (Phnom Penh (Port)) | Koh Khel | Neak Luong | Prek Kdam | Tan Chau | Chau Doc |
|--------|----------|-------------|---------------|-------------|-----------|----------|-------|------------------------|---------------------|-------------|--------------|----------------|----------------|----------------|-------|---------------|---------------------------------|--------------------------------|--------|-----------|----------|--------|---------|
| 25/06  | 1.00     | 2.50        | nr            | 0.20        | nr         | 1.60     | 0.10  | nr                      | nr                  | nr          | nr           | nr             | nr             | nr             | nr    | nr            | nr                                      | nr                                      | nr     | nr         | nr       | nr     |
| 26/06  | nr        | nr          | nr            | nr          | nr         | nr       | 24.7  | 12.7                     | 11.9                | 0.9          | nr           | 2.6            | 8.5             | nr             | nr    | nr            | nr                                      | nr                                      | nr     | nr         | nr       | nr     |
| 27/06  | nr        | nr          | nr            | nr          | nr         | nr       | 24.7  | 12.7                     | 11.9                | 0.9          | nr           | 2.6            | 8.5             | nr             | nr    | nr            | nr                                      | nr                                      | nr     | nr         | nr       | nr     |
| 28/06  | nr        | nr          | nr            | nr          | nr         | nr       | 24.7  | 12.7                     | 11.9                | 0.9          | nr           | 2.6            | 8.5             | nr             | nr    | nr            | nr                                      | nr                                      | nr     | nr         | nr       | nr     |
| 29/06  | nr        | nr          | nr            | nr          | nr         | nr       | 24.7  | 12.7                     | 11.9                | 0.9          | nr           | 2.6            | 8.5             | nr             | nr    | nr            | nr                                      | nr                                      | nr     | nr         | nr       | nr     |
| 30/06  | 1.00      | 2.50        | nr            | 0.20        | nr         | 1.60     | 0.10  | nr                      | nr                  | nr          | nr           | nr             | nr             | nr             | nr    | nr            | nr                                      | nr                                      | nr     | nr         | nr       | nr     |
| 01/07  | nr        | nr          | nr            | nr          | nr         | nr       | 32.5  | 67.4                     | nr                  | 0.5          | 37.5         | nr             | 30.0            | 24.5           | 55.2 | 1.8           | 0.0                                    | 18.2                                    | 8.2   | 1.3         | 2.0       | nr     |
| 02/07  | nr        | nr          | nr            | nr          | nr         | nr       | 32.5  | 67.4                     | nr                  | 0.5          | 37.5         | nr             | 30.0            | 24.5           | 55.2 | 1.8           | 0.0                                    | 18.2                                    | 8.2   | 1.3         | 2.0       | nr     |
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 water levels for the past week shows the abnormal pattern in which the accuracies at stations in the upper reach were much better than that in the middle reach.

In general the overall accuracy is good for 1-day to 3-day forecast lead time at stations in the upper and lower reaches of LMB, however accuracies at stations from Nakon Phanon/Thakhet to Khong Chiam in the middle reach and stations Tan Chau, Chau Doc in the Mekong delta for 4-day and 5-day forecast were less than expected. The differences due to 3 main factors: (1) high variability of rainfall forecast from NWP; (2) internal model functionality in forecasting especially at those stations; for which the parameter adjustment in the model is not possible; (3) the adjustment by utilizing the practical knowledge and experiences of forecaster-in-charge.

![Graph showing average flood forecast accuracy along the Mekong mainstream](image-url)
**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).

<table>
<thead>
<tr>
<th></th>
<th>Chiang Saen</th>
<th>Luang Prabang</th>
<th>Chiang Khan</th>
<th>Vientiane</th>
<th>Nongkhai</th>
<th>Paksane</th>
<th>Nakhon Phanom</th>
<th>Thakhek</th>
<th>Mukdahan</th>
<th>Savannakhet</th>
<th>Khong Chiam</th>
<th>Pakse</th>
<th>Siem Reap</th>
<th>Stung Treng</th>
<th>Kratie</th>
<th>Kompong Cham</th>
<th>Phnom Penh (Bassac)</th>
<th>Phnom Penh Port</th>
<th>Koh Khe</th>
<th>Neak Luong</th>
<th>Prek Kdam</th>
<th>Tan Chau</th>
<th>Chau Doc</th>
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<tr>
<td>1-day</td>
<td>100.0</td>
<td>71.4</td>
<td>100.0</td>
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<td>28.6</td>
<td>14.3</td>
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<td>71.4</td>
<td>42.9</td>
<td>85.7</td>
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<tr>
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<td>0.0</td>
<td>25.0</td>
<td>0.0</td>
<td>69.3</td>
</tr>
<tr>
<td>5-day</td>
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<td>66.7</td>
<td>100.0</td>
<td>66.7</td>
<td>66.7</td>
<td>66.7</td>
<td>0.0</td>
<td>33.3</td>
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<td>100.0</td>
<td>33.3</td>
<td>66.7</td>
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</tbody>
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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).

A new set of performance indicators that is established by combining international standards and the specific circumstances in the Mekong River Basin, is applied officially for the flood season of 2011 onward.
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 5 days including the current report date

| Week | FF completed and sent (time) | FF2 completed and sent (time) | Weather information available (number) | NOAA data | China | Cambodia - DHRW | Cambodia - DOM | Lao PDR - DMH | Thailand - DWR | Viet Nam - NCHMF | NOAA data | China | Cambodia - DHRW | Cambodia - DOM | Lao PDR - DMH | Thailand - DWR | Viet Nam - NCHMF |
|------|-----------------------------|-------------------------------|----------------------------------------|-----------|------|-----------------|---------------|---------------|---------------|----------------|-----------|------|-----------------|---------------|---------------|---------------|----------------|----------------|
| 2012 | week 10:43                  | 1                             | 4                                      | 07:12     | 08:09| 07:26           | 05:45         | 09:00         | 07:21         | 07:15          | 1         | 0    | 0               | 41            | 272           | 2              | 138           |
|      | month 10:42                 | 1                             | 17                                     | 07:12     | 08:11| 07:27           | 06:13         | 08:54         | 07:34         | 07:19          | 1         | 0    | 47              | 435           | 636           | 3              | 389           |
|      | season 10:42                | 1                             | 20                                     | 07:12     | 08:11| 07:32           | 06:13         | 08:55         | 07:33         | 07:18          | 1         | 0    | 69              | 503           | 655           | 4              | 434           |

*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.

![Data Delivery - Delivery Times](image)

Figure B2: Data delivery times for the past 8 days including the current report date
Figure B3: Missing data for the past 8 days including the current report date

Figure B4: Flood forecast completion time

Figure B5: Flood forecast stations without forecast

Figure B6: Second forecast needed
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.

HYDROGRAPHS OF THE MEKONG AT MAINSTREAM STATIONS
IN FLOOD SEASON FROM 1 JUNE TO 31 OCTOBER

Water level at 7am of Mekong at Jing Hong

Water level at 7am of Mekong at Chiang Saen

Water level at 7am of Mekong at Luang Prabang

Water level at 7am of Mekong at Chiang Khan
Water level at 7am of Mekong at Chiang Khan

Water level at 7am of Mekong at Vientiane

Water level at 7am of Mekong at Nong Khai
Water level at 7am of Mekong at Savannakhet

Water level at 7am of Mekong at Mukdahan

Water level at 7am of Mekong at Khong Chiam
Water level at 7am of Mekong at Paksé

Water level at 7am of Mekong at Stung Treng

Water level at 7am of Mekong at Kratie
**Water level at 7am of Mekong at Kampong Cham**

![Graph of water level at 7am of Mekong at Kampong Cham]

**Water level at 7am of Mekong at Phnom Penh Chaktomuk**

![Graph of water level at 7am of Mekong at Phnom Penh Chaktomuk]

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

![Graph of water level at 7am of Tonle Sap at Phnom Penh Port]
Water level at 7am of Bassac at Koh Khel

Water level at 7am of Mekong at Neak Luong

Water level at 7am of Tonle Sap at Prek Kdam