



# Mekong River Commission Regional Flood Management and Mitigation Programme

Report on data collection and data transfer performance  
evaluation report for the dry season 2013/14



Prepared by:  
Regional Flood Management and Mitigation Center  
December 2014





## Certification of Approval of Internal FMMP Technical Document

Report on data collection and data transfer performance  
evaluation report for the dry season 2013/14

No	Name of Person	Position	Date	Signature
1.	Dr. Pichaid Varoonchotikul	River Flood Forecasting Expert	22/1/15	
2.	Mr. Nguyen Quoc Anh	Operational Meteorologist/Forecaster	22/1/15	
3.	Mr. Hourt Khieu	Operations Manager	23/1/15	
4.	Ir. Nicolaas Bakker	International Technical Advisor	26.02.2015	
5.	Mr. Oudomsack Philavong	FMMP Coordinator	26/02/15	
6.	Dir. Truong Hong Tien	TSD Director	2/3/15	



## Table of Contents

Table of Contents .....	i
List of Figures .....	i
List of Tables .....	ii
List of Abbreviation .....	iii
1. Background.....	1
1.1 Hydro-meteorological network providing data for flood forecast.....	1
1.2 Log-sheets of arrival time and number of missing data.....	6
2. Data transfer from stations to the data terminal at national line agencies .....	9
2.1 Data transfer from stations to the DHRW data terminal.....	9
2.2 Data transfer from stations to DOM data terminal .....	10
2.3 Data transfer from stations to the DMH data terminal .....	11
2.4 Data transfer from stations to the DWR data terminal .....	13
2.5 Data transfer from stations to the NCHMF data terminal.....	14
3. Summary and conclusion for dry season 2013-2014.....	17
3.1 Summary .....	17
3.2 Conclusion.....	18
4. References .....	19

## List of Figures

Figure 1-1 Map of locations of stations using the SMS for data sending for River Monitoring in dry season 2013-2014.....	6
Figure 2-1 Arrival time of data collected on the Hydmet at Cambodia - DHRW data terminal during dry season 2013-2014. ....	9
Figure 2-2 Number of missing data collected at Cambodia - DHRW data terminal during dry season 2013-2014.....	10
Figure 2-3 Arrival time of data collected on the Hydmet at Cambodia - DOM data terminal during the dry season 2013-2014.....	11
Figure 2-4 Number of missing data collected at Cambodia - DOM data terminal during dry season 2013-2014. ....	11
Figure 2-5 Arrival time of data collected on the Hydmet at Lao PDR - DMH data terminal during dry season 2013-2014.....	12
Figure 2-6 Number of missing data collected at Lao PDR - DMH data terminal during dry season 2013-2014. ....	12
Figure 2-7 Arrival time of data collected on the Hydmet at Thailand - DWR data terminal during dry season 2013-2014.....	13
Figure 2-8 Number of missing data collected at Thailand - DWR data terminal during dry season 2013-2014. ....	14

Figure 2-9	Arrival time of data collected on the Hydmet at Viet Nam - NCHMF data terminal during dry season 2013-2014. ....	15
Figure 2-10	Number of missing data collected at NCHMF data terminal during dry season 2013-2014.....	15

## **List of Tables**

Table 1-1	Name of National Line Agencies and the start and end dates of renewed MOUs/TOR. ....	2
Table 1-2	List of Hydro-meteorological stations to be provided the data to RFMMC during the dry season 2013-2014. ....	3
Table 3-1	Summary of Number of Late Arrival Data and Missing Data of the four Countries. ....	17

## **List of Abbreviation**

CNMC	Cambodia National Mekong Committee
DHM	Department of Hydrology and Meteorology, Lao PDR
DHRW	Department of Hydrology and River Works, Cambodia
DOM	Department of Meteorology, Cambodia
DWR	Department of Water Resource, Thailand
FMMP	Flood Management and Mitigation Programme
FTP	File transfer protocol
LNMC	Lao PDR Lao National Mekong Committee
MCs	MRC Members' Countries
MONRE	Ministry of Natural Resource and Environment
MOWRAM	Ministry of Water Resource and Meteorology
MOWRE	Ministry of Water Resource and Environment
MOU	Memo of Understanding
MRC	Mekong River Commission
MRCS	Mekong River Commission Secretariat
NCHMF	National Centre for Hydrology and Meteorology Forecast, Vietnam
NLAs	National Line Agencies
NMC	National Mekong Committee
RFMMC	Regional Flood Management and Mitigation Centre
TNMC	Thai National Mekong Committee
TOR	Term of Reference
VNMC	Viet Nam National Mekong Committee





## **1. Background**

### **1.1 Hydro-meteorological network providing data for flood forecast**

Hydro-meteorological data collection is a core activity of the Mekong River Commission (MRC) since the establishment of the Mekong Committee in 1957. Under the Flood Mitigation and Management Programme (FMMP), it serves various purposes such as the flood forecast on the Mekong which is one of important issues that MRC Secretariat (MRCS) has been concerned since 1970. After the establishment of the Regional Flood Management and Mitigation Centre (RFMMC) in Phnom Penh, Cambodia in 2006, the flood forecasts and river monitoring have been taken over by the Centre up to now.

Over the past six year from 2007 to 2012, these tasks have been successfully implemented under the prevailing Memorandum of Understanding (MOU) or Terms of Reference<sup>1</sup> (TOR) between MRCS and MRC Member Countries (MCs) for data collection and transfer from National Line Agencies (NLAs) of the MCs to the RFMMC.

The MOUs/TOR was renewable and approved. They provided a formal agreement between MRCS and the MCs for data collection and transfer from the NLAs to RFMMC for flood forecasting and river monitoring. These activities were considered as the routine functions of the RFMMC. Table 1-1 shows the name of NLAs; the effects and terminated date of the MOUs/TOR.

This report will only consider data transfer and performance during Dry-Season (November 2013-May 2014) for producing the River Monitoring Bulletin.

---

<sup>1</sup> is required by TNMC as a contract/agreement modality

Table 1-1 Name of National Line Agencies and the start and end dates of renewed MOUs/TOR.

No	Name of National Line Agency, Country	Start and end dates
1	Department of Hydrology and River Works (DHRW), Ministry of Water Resource and Meteorology (MOWRAM) in Cambodia, CNMC	01 January 2013 to 31 December 2015
2	Department of Meteorology (DOM), Ministry of Water Resource and Meteorology (MOWRAM) in Cambodia, CNMC	01 January 2013 to 31 December 2015
3	Department of Meteorology and Hydrology (DMH), Ministry of Natural Resource and Environment (MONRE) in Lao PDR, LNMC	03 April 2013 to 02 April 2016
4	Department of Water Resources (DWR), Ministry of Water Resource and Environment (MOWRE) in Thailand, TNMC	1 June 2013 to 31 May 2014
5	National Centre for Hydro-Meteorological Forecast of Hydro-Meteorological Service, (NCHMF/NCHMF), Ministry of Water Resources and Environment in Viet Nam, VNMC	06 June 2013 to 05 June 2016

According to the MOUs/TOR, the data are collected at the observation stations, sent to the national terminal of the NLAs and then transferred to the RFMMC data terminal through the regular update data on the Hydmet database software and e-mail. This Hydmet-software was installed at every NLA of the MCs who signed the MOU with MRCS for the data provision for flood forecasting beginning from 01 June to 31 October and river monitoring from 01 November to 31 May. The data collection from all stations during the wet and dry seasons help to improve the MRC flood forecasting and river monitoring, as well as to better understand the behavior of rainfall and water levels during the entire hydrologic cycle.

The operational data for the flood forecasting was weekly provided to the RFMMC by the NLAs during the dry season, preferably before 8.30AM. Between 8.30AM-10.00AM, the RFMMC collected, compiled and analyzed the data for river monitoring activities and then disseminates the river monitoring bulletins between 10.00AM and 10.30AM to all concerned MRC programmes, national government agencies and international organizations for those who are working on the flood relief, emergency and management including for various purposes and researches/studies.

The hydro-meteorological data of 146 stations are collected and transferred from NLAs to the RFMMC of which 15, 34, 43, 10 and 44 stations respectively were received from DHRW (Cambodia), DOM (Cambodia); DMH (Lao PDR); DWR (Thailand) and NCHMF (Viet Nam). Table 1-2 shows a list of stations and Figure 1-1 indicates the map of locations of stations.

The objective of this report is to summarize and evaluate the performance of data collection and transfer from the NLAs to the RFMMC FTP data terminal during the dry season 2013-2014 and conclude key activity needed to be improved for the future.

Table 1-2 List of Hydro-meteorological stations to be provided the data to RFMMC during the dry season 2013-2014.

No	Hymos ID	Station Name	Type of Data	Basin /River
<b>DHRW, Cambodia (15 stations)</b>				
1	14501	Stung Treng	WL, Rainfall	Mekong
2	14901	Kratie	WL, Rainfall	Mekong
3	19802	Kampong Cham	WL, Rainfall	Mekong
4	33401	Chaktomuk	WL, Rainfall	Bassac
5	20101	P.P. Port	WL	Tonle Sap
6	20102	Prek Kdam	WL, Rainfall	Tonle Sap
7	19806	Neak Loung	WL, Rainfall	Mekong
8	33402	Koh Khel	WL, Rainfall	Bassac
9	20103	Kampong Chnnang	WL	Tonle Sap
10	620101	Kampong Tmar	WL	Tributary Tonle Sap
11	570101	Kampong Kdey	WL	Tributary Tonle Sap
12	600101	Kampong Chen	WL	Tributary Tonle Sap
13	20106	Kampong Loung	WL	Tonle Sap
14	450101	Lum Phat	WL	Sre Pok
15	440102	Veun Sai	WL	Se San
<b>DOM, Cambodia (34 stations)</b>				
1	130322	Bantey Srey	Rainfall	Stung Seam Reap
2	130505	Sadan	Rainfall	Stung Sen
3	120505	Sambo	Rainfall	Mekong
4	120606	Snoul	Rainfall	Prek Chlong
5	130326	Srey Snam	Rainfall	Stung Sreng
6	120309	Talo	Rainfall	Stung Pursat
7	130309	Sre Noy	Rainfall	Stung Seam Reap
8	130202	Sisophon	Rainfall	St. Mongkul Borey
9	130200	O Krieng	Rainfall	Prek Krieng
10	134010	O Yadav	Rainfall	Se San
11	130220	Koh Gneak	Rainfall	Sre Pok
12	134910	Koulen	Rainfall	Stung Sen
13	134813	Tbeng Meanchey	Rainfall	Stung Sen
14	141112	Oudor Meanchey	Rainfall	Sung Sreng
15	110404	Kampong Speu	Rainfall	Prek Thnot
16	110433	Oral	Rainfall	Prek Thnot
17	110434	O Taroat	Rainfall	Prek Thnot
18	110445	Trapang Cho	Rainfall	Prek Thnot
19	120202	Pailin	Rainfall	Stung Sanker
20	120302	Pursat	Rainfall	Stung Pursat
21	120303	Moung Russey	Rainfall	Stung Dauntry
22	120304	Dap Bat	Rainfall	Stung Pursat
23	120312	Kravanh	Rainfall	Stung Pursat
24	120420	Tuk Phos	Rainfall	St. Boribo

No	Hymos ID	Station Name	Type of Data	Basin /River
25	120423	Stung Chinit	Rainfall	Stung Chinit
26	120520	Chambac	Rainfall	Mekong
27	120602	Peam Te	Rainfall	Prek Te
28	120607	Svay Chreas	Rainfall	Prek Chhlong
29	120611	Kantout	Rainfall	Prek Te
30	130506	Seambok	Rainfall	Mekong
31	130507	Tala Boriwat	Rainfall	Mekong
32	140605	Se San	Rainfall	Se San
33	140603	Seam Pang	Rainfall	Sekong
34	130208	Bovel	Rainfall	St. Mongkul Borey
<b>DMH, Lao PDR (43 stations)</b>				
1	10402	Xieng Kok	WL	Mekong
2	10901	Pak Beng	WL, Rainfall	Mekong
3	11201	Luang Prabang	WL, Rainfall	Mekong
4	11401	Paklay	WL	Mekong
5	11901	Vientiane	WL, Rainfall	Mekong
6	12703	Paksane	WL, Rainfall	Mekong
7	13102	Thakhek	WL, Rainfall	Mekong
8	13401	Savannakhet	WL, Rainfall	Mekong
9	13901	Pakse	WL, Rainfall	Mekong
10	230101	Bang Pakkanhoung	WL, Rainfall	Nam Ngum
11	250101	Moung Mai	WL, Rainfall	NamNhiep
12	270101	Ban Phonsi	WL, Rainfall	Nam Cadin
13	260101	Moung Keo(Borikan)	WL, Rainfall	Nam Sane
14	320107	Mahaxai	WL, Rainfall	Se Banfai
15	390102	Khong Sedone	WL, Rainfall	Se Done
16	390103	Saravanne	WL, Rainfall	Se Done
17	430106	VeunKhen	WL, Rainfall	Sekong
18	430105	M. May(Attapeu)-Veunken	WL, Rainfall	Sekong
19	100102	Moung Ngoy	WL, Rainfall	Nam Ou
20	120101	Ban Mixay	WL,	Nam Khan
21	190103	Sayaboury	Rainfall	Nam Houng
22	190205	Xieng Ngeun	Rainfall	Nam Khan
23	180207	Vang Vieng	WL, Rainfall	Nam Ngum
24	230113	Phiengluang	WL, Rainfall	Nam Ngum
25	200204	Oudomxay	Rainfall	Nam Ou
26	210201	Phonsaly	Rainfall	Nam Ou
27	200101	Moung Namtha	Rainfall	Nam Tha
28	270903	Ban Signo	WL, Rainfall	Nam Cadine
29	190302	XiengKhoung	Rainfall	Nam Nhiep
30	14301	Ban Chan Noi	WL	Mekong
31	170505	Kuanpho	Rainfall	Se Banfai
32	350101	Ban Keng Don	Rainfall	Se Banhieng
33	350106	Highway Bridge	WL, Rainfall	Se Banhieng
34	160505	Kengkok	Rainfall	Se Banhieng
35	390104	Souvanna Khill	WL	Se Done
36	160506	Phalan	Rainfall	Se Banhieng
37	160605	Moung Phil	Rainfall	Se Banhieng
38	150604	Laongam	Rainfall	Se Done

No	Hymos ID	Station Name	Type of Data	Basin /River
39	160602	Moung Nong	Rainfall	Se Done
40	150607	Nikum 34	Rainfall	Sekong
41	160601	Moung Tcheraphon	Rainfall	Se Done
42	150609	Sekong	WL, Rainfall	Sekong
43	160504	Ban Donheng	Rainfall	Se Banhieng
<b>DWR, Thailand (10 stations)</b>				
1.	10501	Chiang Saen	WL, Rainfall	Mekong
2.	10801	Chiang Khong	WL,	Mekong
3.	11903	Chian Khan	WL, Rainfall	Mekong
4.	13801	Khong Chiam	WL, Rainfall	Mekong
5.	12001	Nong Khai	WL, Rainfall	Mekong
6.	13101	Nakhon Phanom	WL, Rainfall	Mekong
7.	13402	Mukdahan	WL, Rainfall	Mekong
8.	70103	Thoeng	WL, Rainfall	Nam Mae In
9.	50104	Chiang Rai	WL, Rainfall	Nam Mae Kok
10.	290102	Ban Tha Kok Daen	WL, Rainfall	Nam Songkhram
<b>NCHMF, NCHMF, Viet Nam (44 stations)</b>				
1	19803	Tan Chau	WL, Rainfall	Mekong
2	19804	My Thuan	WL, Rainfall	Mekong
3	39801	Chau Doc	WL, Rainfall	Bassac
4	39803	Can Tho	WL, Rainfall	Bassac
5	980601	Vam Nao	WL, Rainfall	Vam Nao
6	451305	Ban Don	WL, Rainfall	Srepok
7	440201	Kon Tum	WL, Rainfall	Sesan
8	220201	Moung Te	Rainfall	
9	220303	Tam Duong	Rainfall	
10	220302	Sin Ho	Rainfall	
11	220301	Lai Chau	Rainfall	
12	210305	Tuan Giao	Rainfall	
13	210301	Dien Bien	Rainfall	
14	210303	Quynh Nhai	Rainfall	
15	160611	Khe Sanh	Rainfall	
16	210304	Son La	Rainfall	
17	180505	Houng Khe	Rainfall	
18	180504	Ha Tinh	Rainfall	
19	180601	Ky Anh	Rainfall	
20	170603	Tuyen Hao	Rainfall	
21	170601	Ba Don	Rainfall	
22	170602	Dong Hoi	Rainfall	
23	160706	Dong Ha	Rainfall	
24	160705	A Luoi	Rainfall	Sekong
25	160704	Hue	Rainfall	
26	140715	Dak To	Rainfall	Sesan
27	140703	Pleiku	Rainfall	Sesan
28	130803	An Khe	Rainfall	close to Sesan
29	130804	Ayunpa	Rainfall	Srepok
30	120801	Boun Me Thuoc	Rainfall	Srepok
31	120806	Mdark	Rainfall	Srepok
32	120712	Dak Nong	Rainfall	close to Srepok
33	120805	Buon Ho	Rainfall	Srepok

No	Hymos ID	Station Name	Type of Data	Basin /River
34	180506	Houng Son	Rainfall	
35	220401	Pha Din	Rainfall	
36	220402	Yen Chau	Rainfall	
37	220403	Mai Chau	Rainfall	
38	220404	Tuong Duong	Rainfall	
39	220405	Con Cuong	Rainfall	
40	220407	Tay Ninh	Rainfall	
41	220406	Phuc Long	Rainfall	
42	220408	Dong Xoai	Rainfall	
43	220409	Ialy	Rainfall	
44	450701	Duc Xuyen	WL, Rainfall	



Figure 1-1 Map of locations of stations using the SMS for data sending for River Monitoring in dry season 2013-2014.

## 1.2 Log-sheets of arrival time and number of missing data

Hydro-meteorological data was collected, carefully checked and recorded the arrival time and number of missing data of every station in log-sheets after 9.00 AM every Monday (during Dry-season).

The data arrival time was recorded and the late arrival-data was consider those arrived after 8.30 AM, since forecaster needs to carry out the river monitoring task and disseminate the bulletin before 10.30 AM.

After 9.00 AM, number of missing data would be counted and recorded in the log-sheets. The total number of missing data will be expressed in “Station-Day”.

Based on these log-sheets, the data collection and data transfer performance evaluation were derived and drawn the conclusions.





## 2. Data transfer from stations to the data terminal at national line agencies

### 2.1 Data transfer from stations to the DHRW data terminal

There are 15 hydrological stations of the DHRW stations networks provided data to the DHRW data terminal during dry season 2013-2014 and 10 stations of them are located in the mainstream of the Mekong, Bassac and Tonle Sap Rivers and 5 stations in the tributaries of the Mekong River and the Tonle Sap Great Lake. This number was remained the same since 2012.

During the dry season 2013-2014 period, there were 29 sending and receiving activities and the arrival time (preferable before 8.30AM) was shown in Figure 2-1. In the log-sheets, there was 1 time out of 29 times without records of data arrival time (14/04/2014).

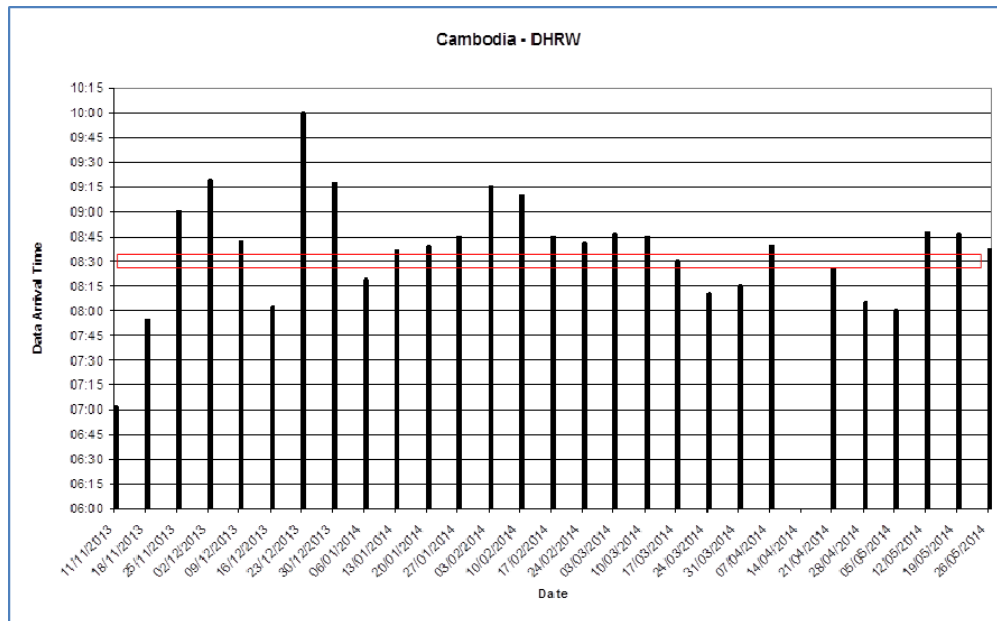


Figure 2-1 Arrival time of data collected on the Hydmet at Cambodia - DHRW data terminal during dry season 2013-2014.

If one considers that data arrived after 8.30AM as late data, there were 19 times that data came late as a result.

Figure 2-2 shown the number of missing data collected on the Hydmet during the dry season 2013-2014. In total, there were 105 missing data during dry season period.

Table 3-1 summarized the Number of Late Arrival Data and Missing Data of the four Countries and is shown in Section 3.

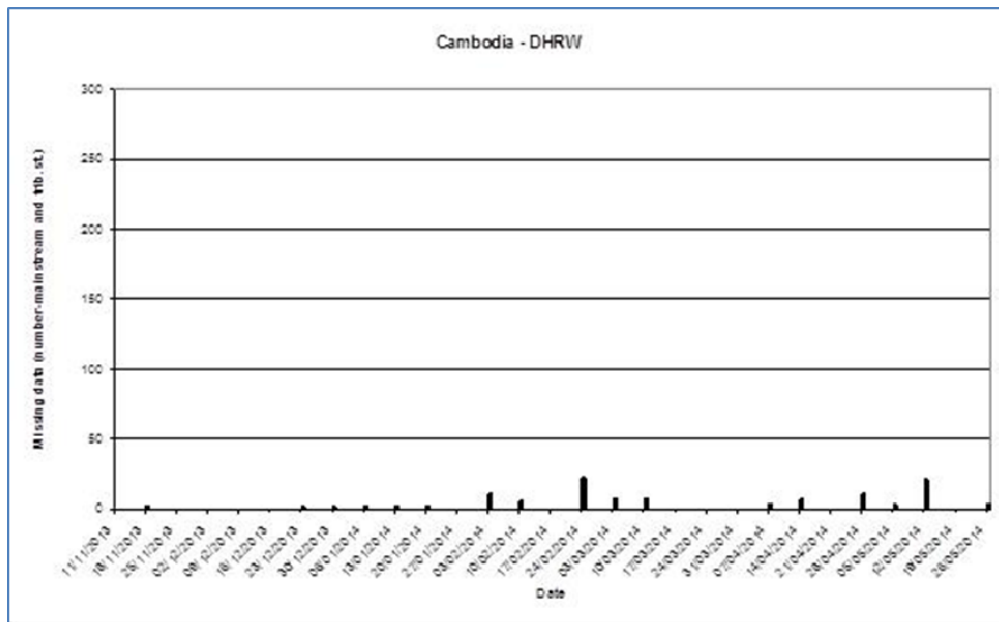


Figure 2-2 Number of missing data collected at Cambodia - DHRW data terminal during dry season 2013-2014.

## 2.2 Data transfer from stations to DOM data terminal

During the dry season 2013-2014, DOM data terminal collected data from 34 rainfall stations as same number stations as in the 2013 flood season. The performance was also maintained at the outstanding level although RFMMC. During this period, data transfer from the DOM to RFMMC was very early well before 8.30AM as shown in Figure 2-3.

Figure 2-3 shows the Arrival time of data collected on the Hydmet at Cambodia - DOM data terminal during the dry season 2013-2014 and based on 8.30AM, there was no delay of data received by MRC. In the log-sheets, there were 5 times out of 29 times without records of data arrival time.

Figure 2-4 shown the number of missing data collected on the Hydmet during the dry season 2013-2014. In total, there were 258 missing data during dry season period

See Table 3-1 for details.

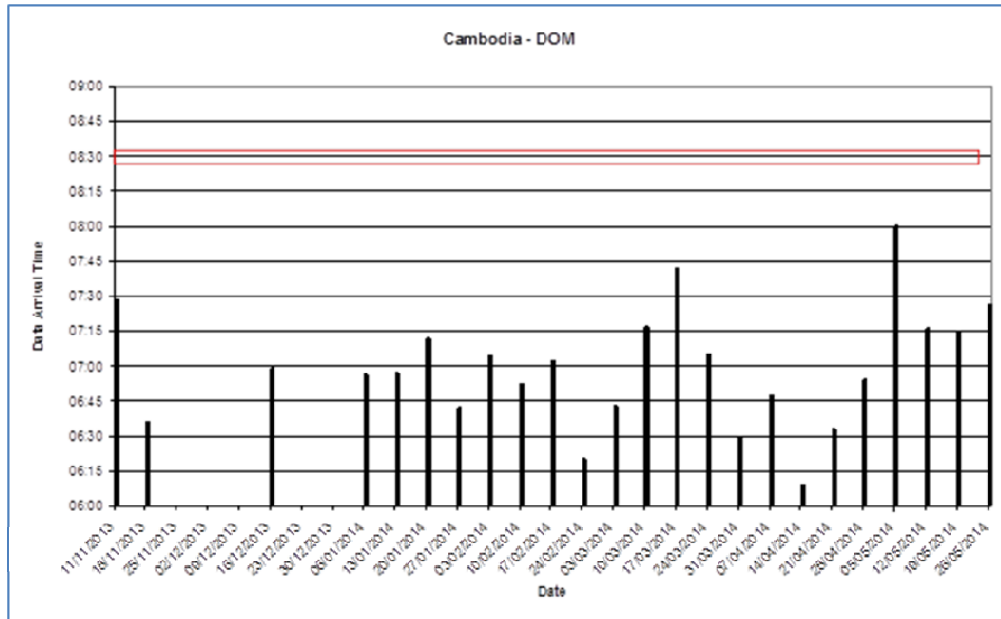


Figure 2-3 Arrival time of data collected on the Hydmet at Cambodia - DOM data terminal during the dry season 2013-2014.

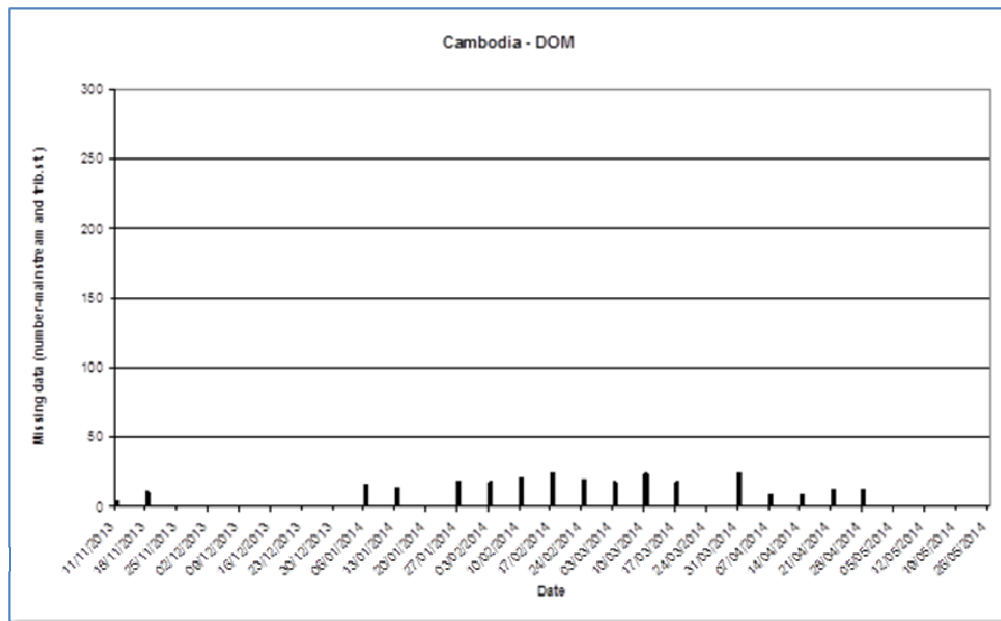


Figure 2-4 Number of missing data collected at Cambodia - DOM data terminal during dry season 2013-2014.

### 2.3 Data transfer from stations to the DMH data terminal

Based on the MOU, DMH should collect the water level and/or rainfall data from 43 stations of which 9 of them were located in the mainstream of the Mekong and 34 stations located in the tributaries of the Mekong River and other main water bodies. However, during the dry season 2013-2014, there were some problems in data collection from either the observations to DMH data terminal and then to the RFMMC terminal.

However, Figure 2-5 showed that 22 out of 29 times of sending and receiving activities were sending later than 8.30AM. In the log-sheets, there were 2 times out of 29 times without records of data arrival time.

Figure 2-6 shows many missing data happened during dry season 2013-2014, the total number of missing data were 3423. See Table 3-1 for details.

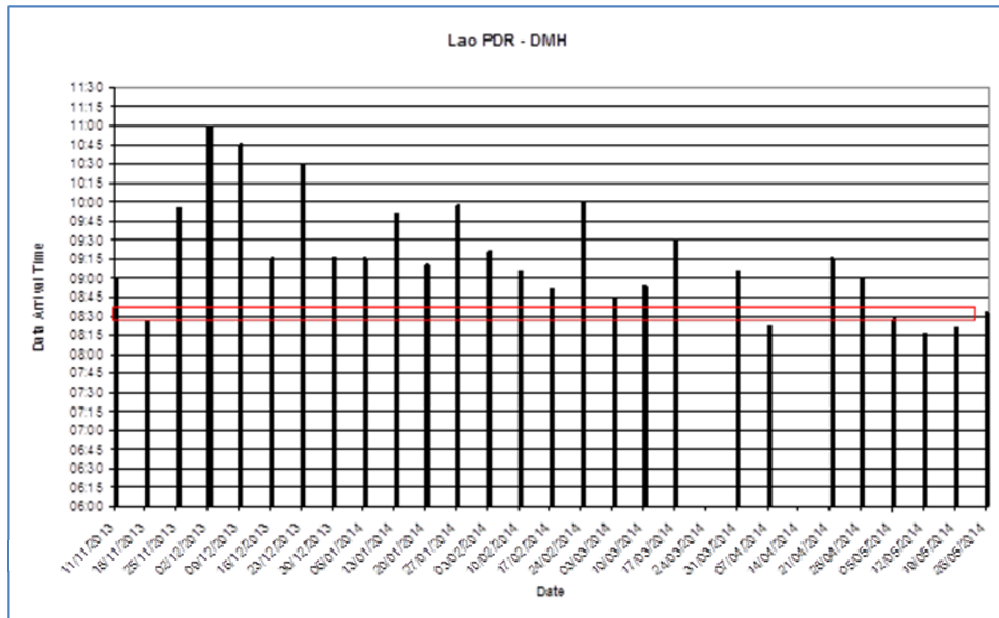


Figure 2-5 Arrival time of data collected on the Hydmet at Lao PDR - DMH data terminal during dry season 2013-2014.

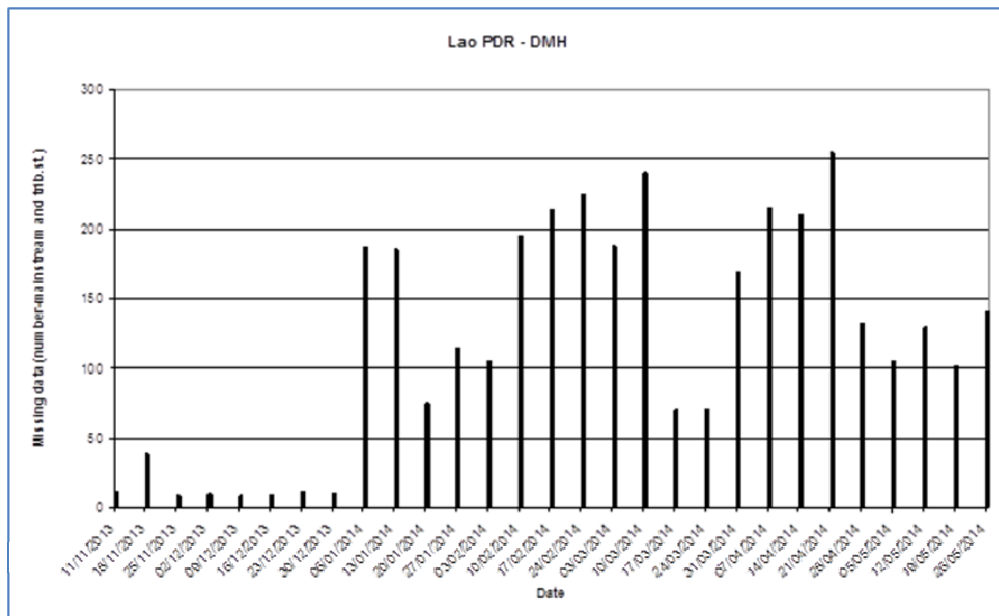


Figure 2-6 Number of missing data collected at Lao PDR - DMH data terminal during dry season 2013-2014.

## 2.4 Data transfer from stations to the DWR data terminal

For the 2013 flood season, the water level and rainfall data was collected at DWR data terminal from 10 stations of which 7 of them were located along the Mekong mainstream and 3 located in tributaries. However, the DWR kindly provided data from 13 stations.

During this period, there were 9 times out of 29 times of sending and receiving activities were sending later than 8.30AM as shown in Figure 2-7 and no missing data see Figure 2-8. In the log-sheets, there was 1 time out of 29 times without records of data arrival time.

More details are shown in Table 3-1.

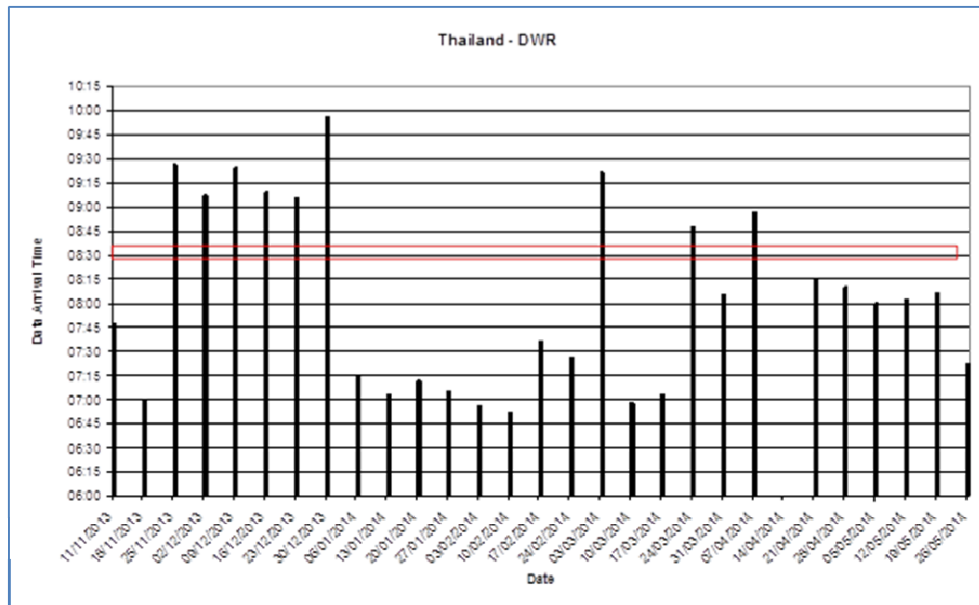


Figure 2-7 Arrival time of data collected on the Hydmet at Thailand - DWR data terminal during dry season 2013-2014.

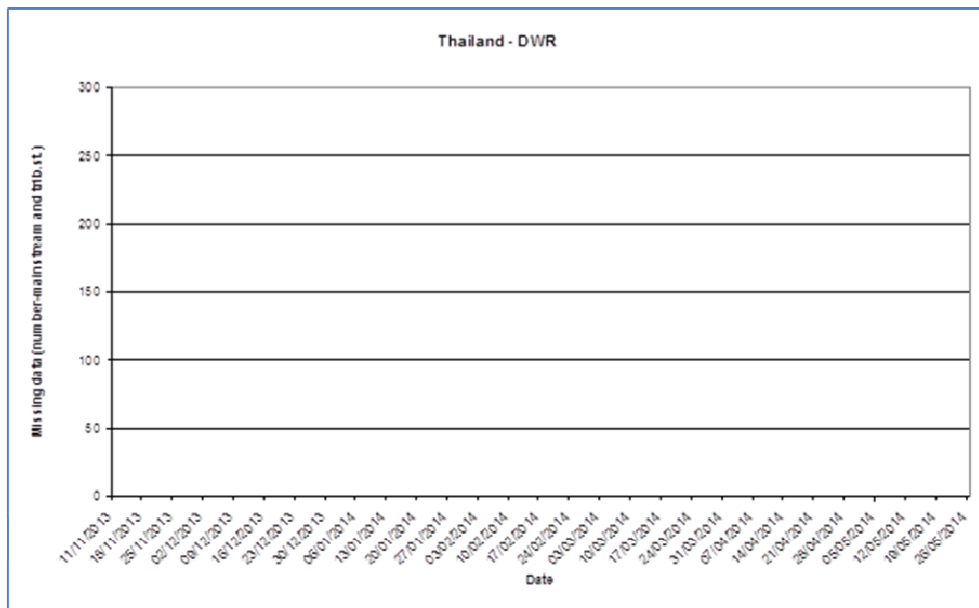


Figure 2-8 Number of missing data collected at Thailand - DWR data terminal during dry season 2013-2014.

## 2.5 Data transfer from stations to the NCHMF data terminal

For the 2013 flood season the Hydro-Meteorological Service (NCHMF) in Viet Nam through the northern and southern parts including the central highland collected and transferred water level and/or rainfall data from 44 stations (100%) to the NCHMF data terminal. 4 stations were located in the mainstream, 39 located in tributaries and 1 in Vam Nao River.

Figure 2-9 shows that Arrival time of data collected on the Hydmet at Viet Nam - NCHMF data terminal during dry season 2013-2014.

During this period, there were 1 times out of 29 times of sending and receiving activities were sending later than 8.30AM as shown in Figure 2-9. In the log-sheets, there were 8 times out of 29 times without records of data arrival time; there were 808 missing data as shown in Figure 2-10. More details are shown in Table 3-1.

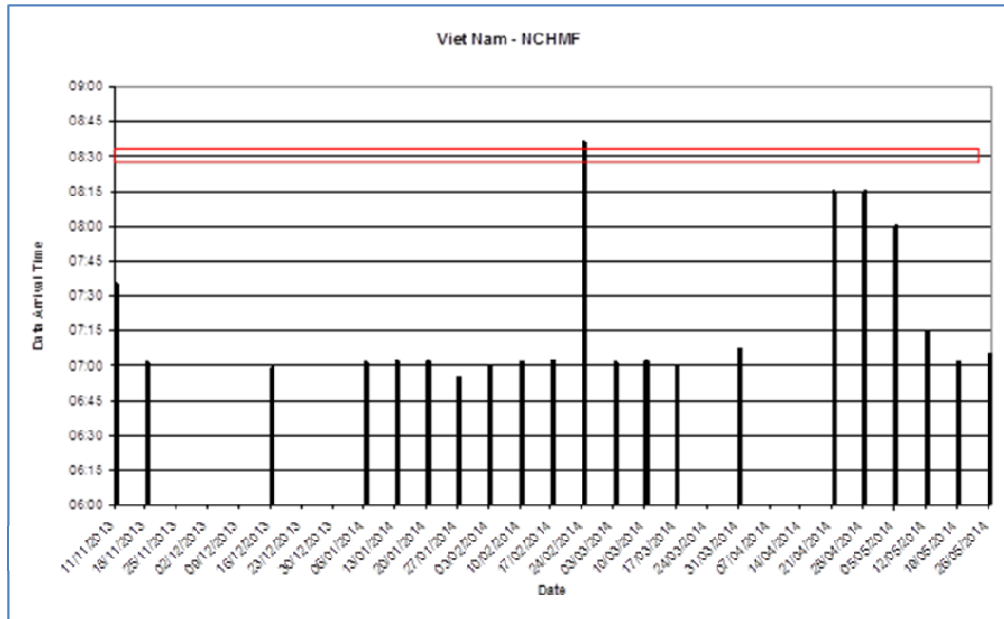


Figure 2-9 Arrival time of data collected on the Hydmet at Viet Nam - NCHMF data terminal during dry season 2013-2014.

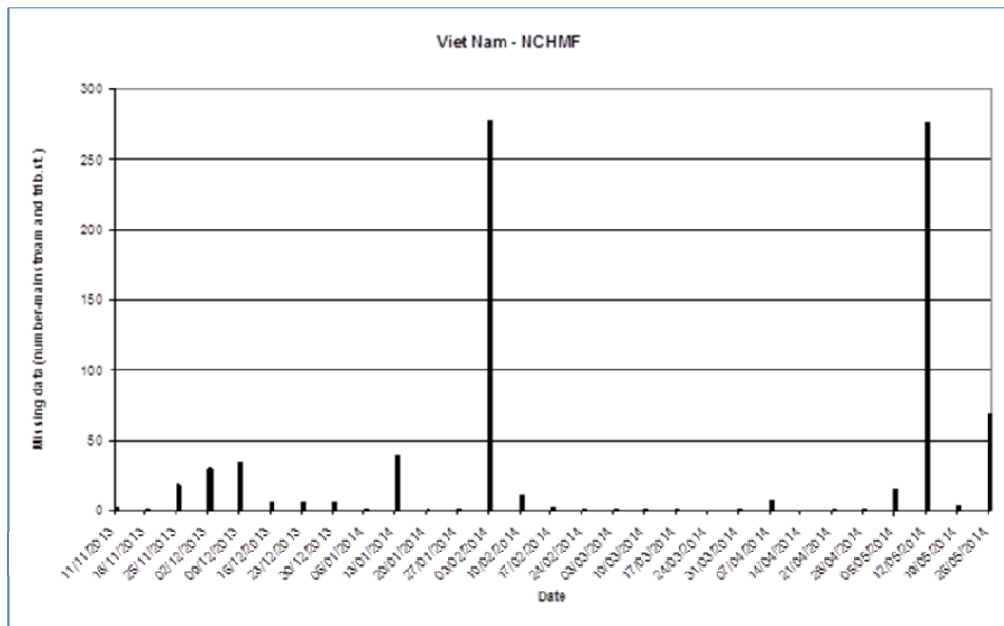


Figure 2-10 Number of missing data collected at NCHMF data terminal during dry season 2013-2014.





### 3. Summary and conclusion for dry season 2013-2014

#### 3.1 Summary

During the dry season 2013-2014, four national line agencies of four MRC Member Countries provided the hydro-meteorological data and weather situation notices to FTP of the RFMMC for river monitoring. In Cambodia, data were getting through two departments (DHRW and DOM); Lao PDR- DMH; Thailand-DWR and Viet Nam-NCHMF.

The data were collected and transferred from 146 stations of which 34 stations were located on the mainstream of Mekong Rivers including Bassac and Tonle Sap and 112 from tributaries and other main water bodies. However, some stations in Lao PDR data were not available due to number factors.

The data collection and transfer performance evaluation were based on: 1) data arrival time on Hydmet. 2) number of missing data from each line agency, expressed in term of “Station-Day”.

The overall observation and analysis, there were 29 days during dry season 2013-2014 that line agencies had to transfer data to RFMMC and the percentage of late arrival data varies from 3.4 - 75.9% as shown in Table 3-1 below.

Regarding with the number of missing data, it varied from 0 to 3423 Station-Days (mostly in Lao PDR and Viet Nam).

Table 3-1 Summary of Number of Late Arrival Data and Missing Data of the four Countries.

Category	Cambodia - DHRW	Cambodia - DOM	Lao PRD - DMH	Thailand - DWR	Viet Nam - NCHMF
Late Arrival Data (Days)	19	0	22	9	1
Late Arrival Data %	65.5%	0.0%	75.9%	31.0%	3.4%
Missing Data	105	258	3423	0	808
Number of time without records of data arrival time	1	5	2	1	8

## **3.2 Conclusion**

Conclusion for the dry season 2013-2014 is that key activities as data collection and transfer performance are needed to be improved from the listed of line agencies as follow in terms of:

- Arrival time: DHRW, DMH, DWR and NCHMF, except DOM.
- Missing data: DHRW, DOM, DMH and NCHMF, except DWR.

RFMMC cannot know the reason why data come late and there is still a number of missing data. It would be better if the line agencies would share their problems and suggest the way to improve these problems in the future, especially during regional technical gathering workshop.

The late data would delay disseminating MRC river monitoring bulletin, therefore RFMMC hopes that there will be an improvement of sending complete data in time in the future.

## **4. References**

MRCS, 2013: Signed MOU and TOR for the hydro-meteorological data collection and transfer from MRC MCs NLAs to RFMMC for 2013-2015/16

NLAs, MCs, 2013: Progress reports on data transfer and O&M during the dry season 2013-2014

RFMMC, Nov 2014: Log sheet excel files for the dry season 2013-2014.