Mekong River Commission

Weekly Dry Season Situation Report in the Lower Mekong River Basin

9 – 15 February 2021

Prepared by
The Regional Flood and Drought Management Centre
16 February 2021

The MRC is funded by contributions from its Member Countries and Development Partners, including Australia, the European Union, Finland, Flanders/Belgium, France, Germany, Japan, Luxembourg, the Netherlands, New Zealand, Sweden, Switzerland, the United States and the World Bank.

Title: Weekly dry season situation report in the Lower Mekong River Basin for 9-15 February 2021

ISSN: 1728-3248

Keywords: flood/drought/weather/Mekong/Tonle Sap

For bibliographic purposes, this volume may be cited as:
Mekong River Commission. (2021). *Weekly dry season situation report in the Lower Mekong River Basin for 9-15 February 2021*. Vientiane: MRC Secretariat.

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Contents

Figures

Table

1 Introduction

This Weekly Dry Season Situation Report presents a preliminary analysis of the weekly hydrological situation in the Lower Mekong River Basin (LMB) for the period from **9-15 February 2021**. The trend and outlook for water levels are also presented.

This analysis is based on the daily hydro-meteorological data provided by the Mekong River Commission (MRC) Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – and on satellite data. All water level indicated in this report refers to an above zero gauge of each station.

The report covers the following topics that are updated weekly:

- General weather patterns, including rainfall patterns over the LMB
- Water levels in the LMB, including in the Tonle Sap Lake
- Flash flood and drought situation in the LMB
- Weather, water level and flash flood forecast, and
- Possible implications.

Mekong River water levels are updated daily and can be accessed from:
http://ffw.mrcmekong.org/bulletin_wet.php.

Drought monitoring and forecasting information is available at:
http://droughtforecast.mrcmekong.org

Flash flood information is accessible at: http://ffw.mrcmekong.org/ffg.php

2 General Weather Patterns

The weather outlook bulletins for three months (February, March, and April) and the weather maps issued by the Thai Meteorological Department (TMD) were used to verify weather conditions in the LMB.

The TMD states that February is the transitional period between winter and summer. The high-pressure air mass areas prevailing over the Mekong region will start to weaken in February. The TMD also predicts that rising air-temperature will occur from this month, prevailing hot season over the Mekong region in between February and April.

Figure 1 presents the weather map of 15 February 2021, showing no line of low pressure crossing the Mekong region.

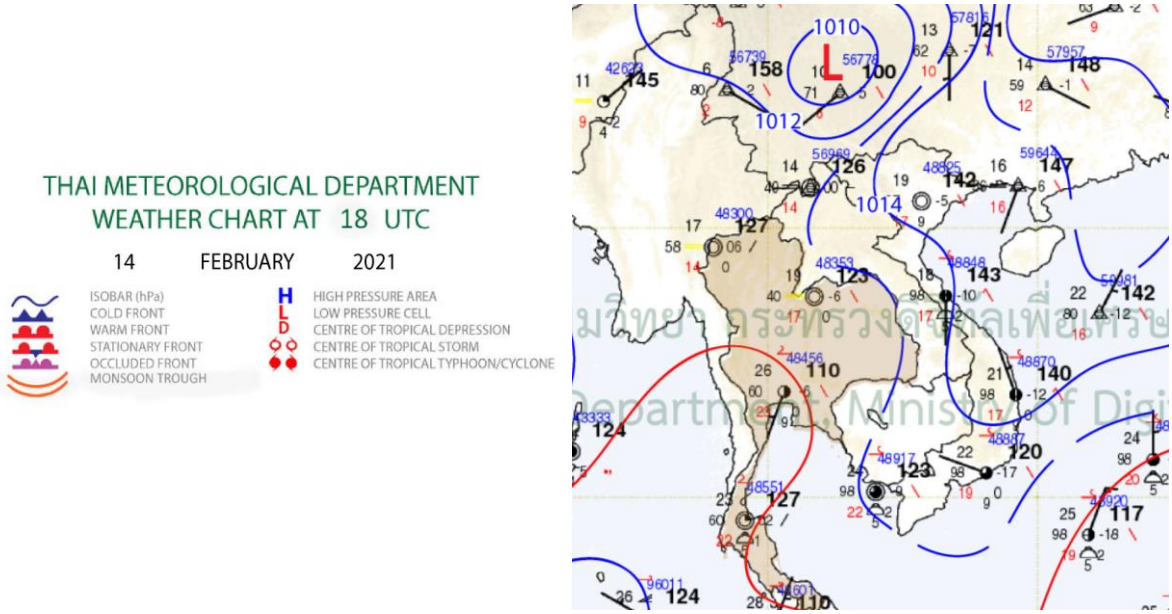


Figure 1: Summary of weather conditions over the LMB.

According to the ASEAN Specialised Meteorological Centre (ASMC), wetter conditions are predicted over the southern part of Southeast Asia and the upper part of the LMB covering Lao PDR and Viet Nam during 8-21 February 2021. However, during this time, the ASMC says that warmer condition may still influence the region.

Figure 2 shows the outlook of comparative warm conditions from 8 to 21 February 2021 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

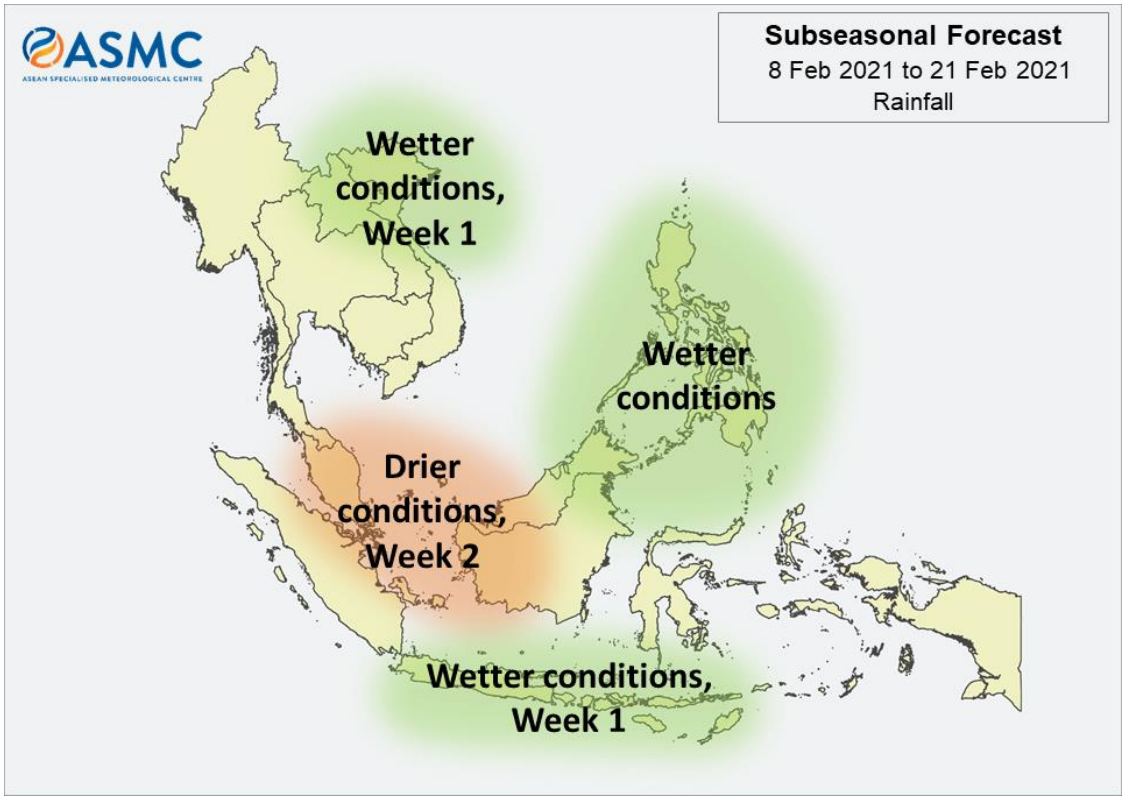


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

2.1 Tropical depressions (TD), tropical storms (TS) and typhoons (TY)

There was no low-pressure line taking place in the lower part of the LMB during 15 February 2021, as shown in Figure 1. This condition indicates that no rainfall in the LMB was presented. Moreover, based on Tropical Strom Risk (TSR), as displayed in Figure 3, there was no sign of tropical depression (TD), tropic storm (TS) or typhoon (TY) in the Mekong region on 15 February 2021.

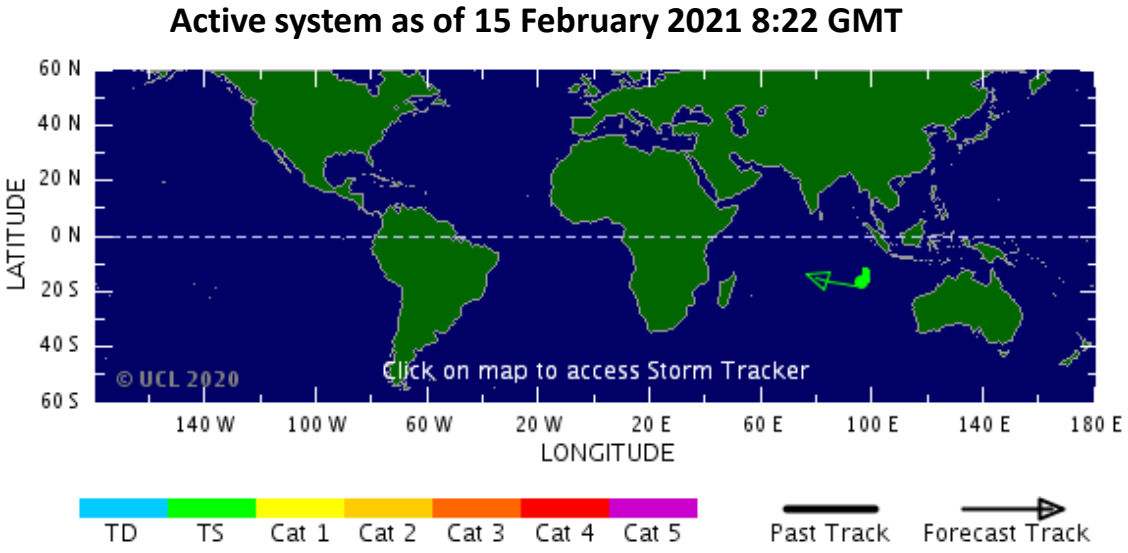


Figure 3: A Tropical Depression risk observed on 15 February 2021.

2.2 Rainfall patterns over the LMB

Due to low-pressure dominating the LMB, this week, recorded rainfall at some key stations from Chiang Saen to Tan Chau and Chau Doc stations was considered high. The rainfall was in between 10 mm and 74 mm. The total observed rainfall of the week at key stations, compare with average rainfall in January is presented in Figure 4.

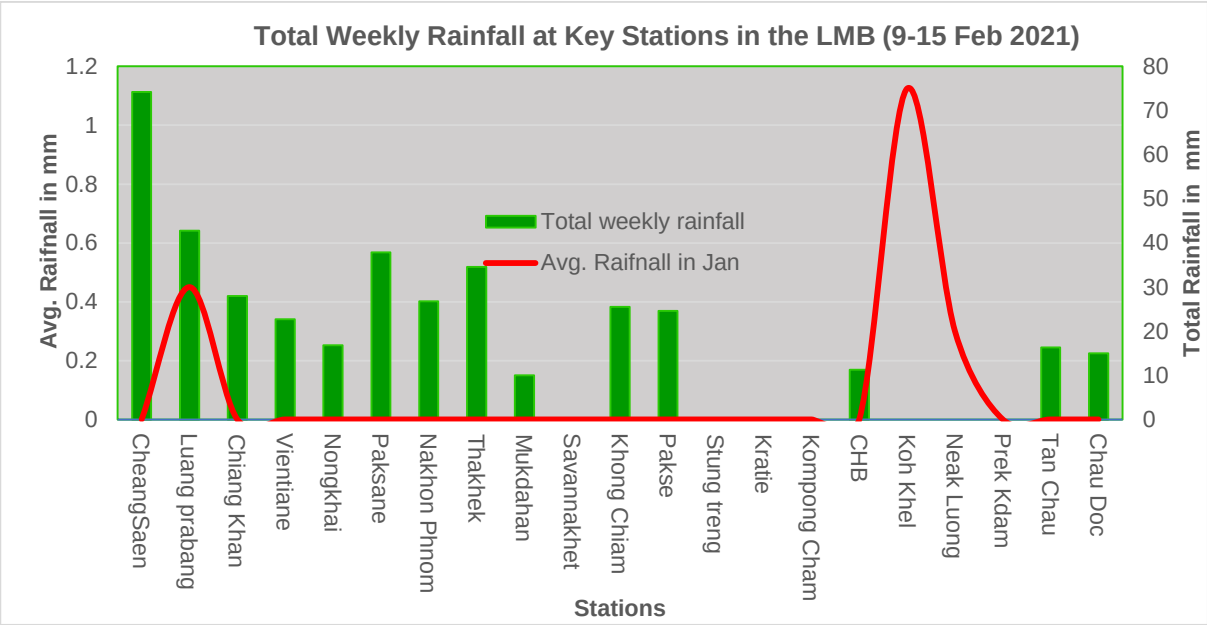


Figure 4: Weekly total rainfall at key stations in the LMB during 9-15 Feb 2021.

To verify area rainfall distribution, Figure 5 shows a map of the weekly accumulated rainfall based on observed data provided by the MRC Member Countries – Cambodia, Lao PDR, Thailand, and Viet Nam – from 9 to 15 February 2021.

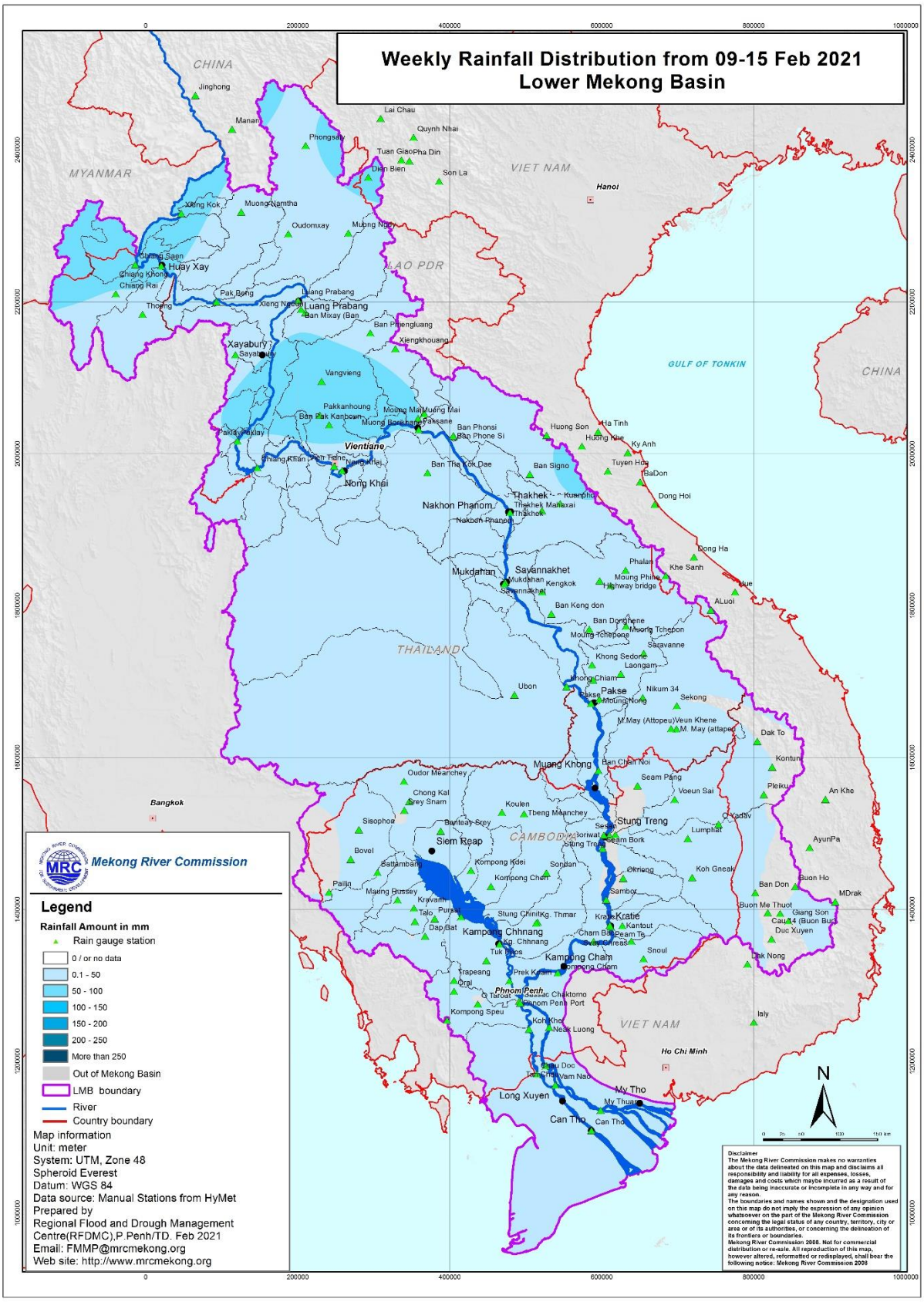


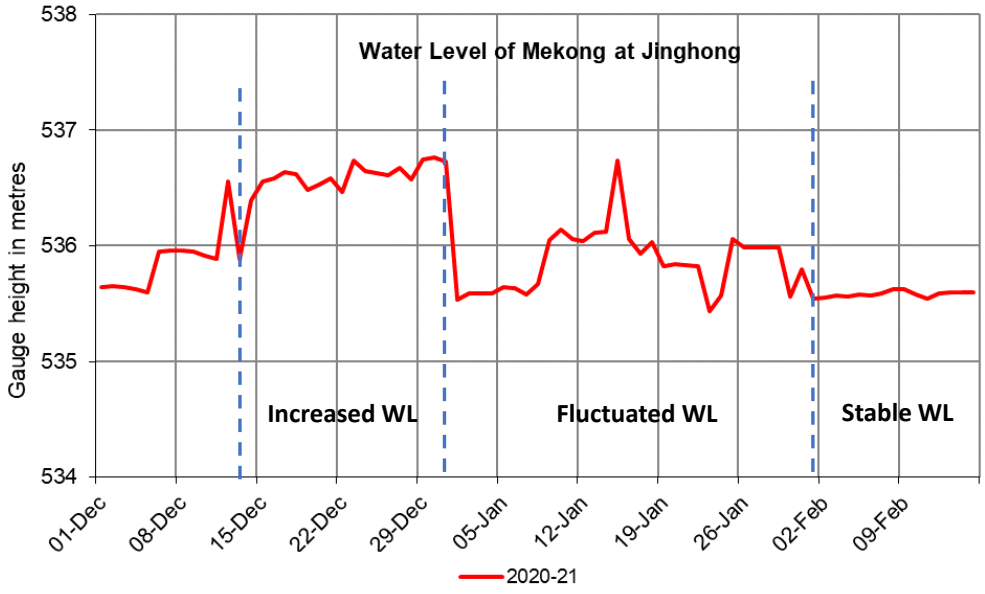
Figure 5: Weekly rainfall distribution over the LMB during 9-15 Feb 2021.

3 Water Levels in the Lower Mekong River

The hydrological regimes of the Mekong mainstream are illustrated by recorded water levels and flows at key mainstream stations: at Chiang Saen to capture mainstream flows entering from the Upper Mekong Basin (UMB); at Vientiane to present flows generated by climate conditions in the upper part of the LMB; at Pakse to investigate flows influenced by inflows from the larger Mekong tributaries; at Kratie in Cambodia to capture overall flows of the Mekong Basin; and at Viet Nam's Tan Chau and Chau Doc to monitor flows to the Delta.

The key stations along the LMB and their respective model application for River Flood Forecasting during the wet season from June to October and River Monitoring during the dry season from November to May are presented in Figure 6. The hydrograph for each key station is available from the MRC's River Flood Forecasting: http://ffw.mrcmekong.org/overview.php. The weekly water levels and rainfall at each key station are summarised in Annex A.

China notified the Mekong River Commission on January 5 stating that Jinghong Dam would release outflows at 1,000 cubic meters per second (m^3/s) from January 5 to 24 for power grid maintenance. This is a significant decrease of water level from its original amount of 536.73 metres on 31 December 2020 down to 535.53 metres on 1 January 2021. Furthermore, between January 29 and February 15, the water level was reduced from 535.99 metres to 535.60 metres. It seems that China's Jinghong Dam is still restricting the release to the Mekong downstream. Water level fluctuation from 1 Dec 2020 to 15 Feb 2021 at Jinghong Dam is presented in the graph below.



The near-real time of hydro-meteorological monitoring at Jinghong Station is presented at https://portal.mrcmekong.org/monitoring/river-monitoring-telemetry.
From 30 January to 15 February 2021, water levels from Chiang Saen in Thailand to Vientiane in Lao PDR were decreased about 0.27 metres and were higher than their TLAs. Water levels from Chiang Khan to Vientiane in Thailand and Lao PDR were likely influenced by the Xayaburi Dam operation, since their water levels increased during Feb 3 and 15 and stayed higher than their LTAs in between 0.92 metres and 0.97 metres.

Water levels from Nakhon Phanom to Pakse in Thailand and Lao PDR decreased about 0.20 metres (from 9 to 15 Feb 2021). It was probably due to the influence of both the Mekong-Lancang upstream and downstream dam operation at Mekong mainstream and its tributaries during the Dry Season.

The increased water level at Jinghong of about 0.42 metres from January 5 to 25 has made water levels at both Thailand's Chiang Saen and Lao PDR's Vientiane higher than their LTAs. This means that the practices of Jinghong Hydropower during January 4 and 24 have significant impacts on the water flow and water levels at Chiang Saen areas.

Based on a hydrological phenomenon, the inflow contribution of water from the upstream of Lancang-Mekong in China to the Mekong mainstream is about 20% in total during the dry season from November to May. The whole inflow of water into the lower Mekong basin is influenced not only by the Mekong-Lancang upstream but also by downstream dam operation at Mekong mainstream and its tributaries during the Dry Season.

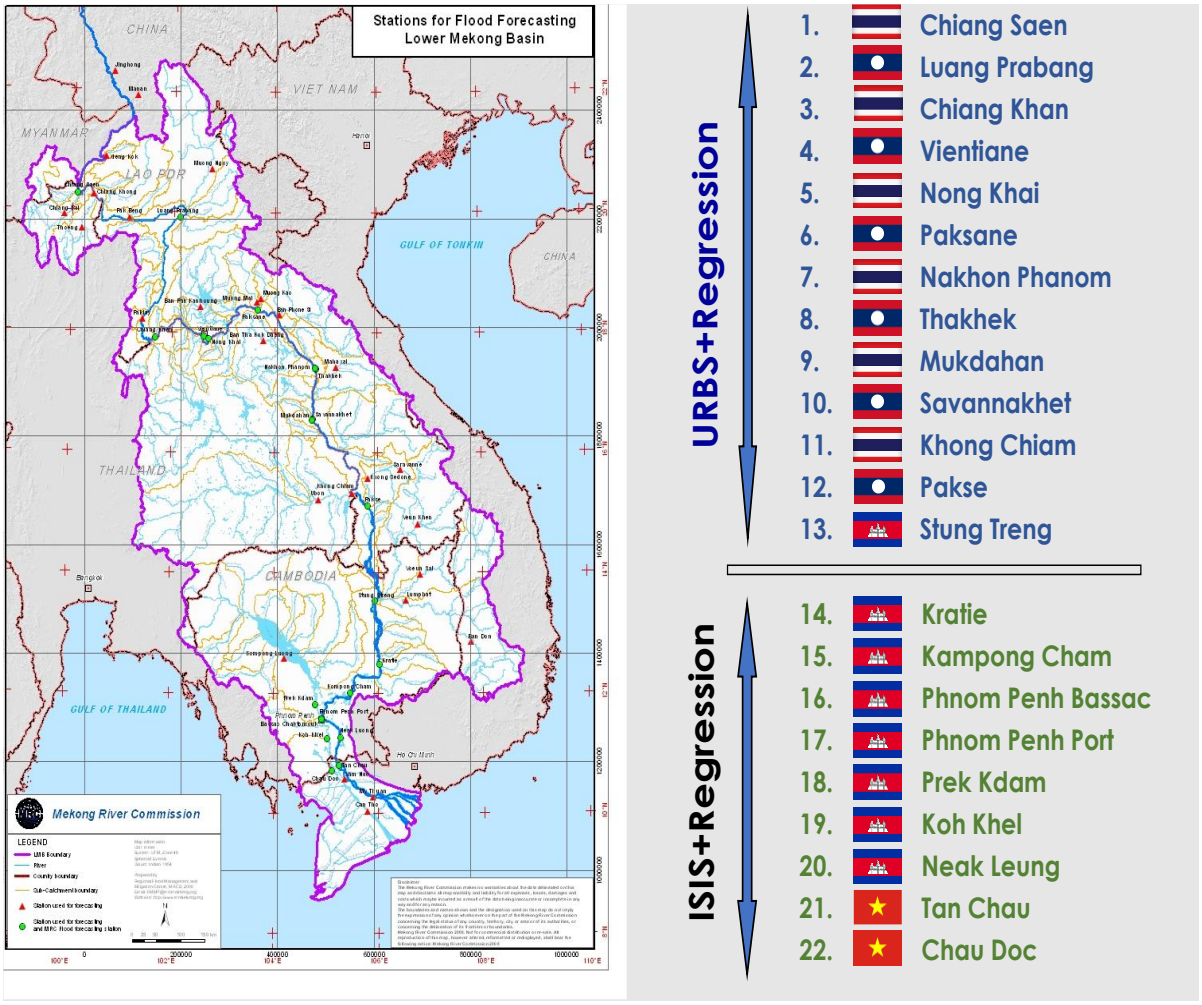


Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.

Chiang Saen and Luang Prabang

The water level from 9 to 15 February 2021 at Thailand's Chiang Saen slightly decreased from 2.11 metres to 1.88 metres. This week's water level is 0.33 metres higher than its long-term average (LTA). When compared to last week, the level this week is lower.

The water level at Luang Prabang station in Lao PDR increased from 7.80 metres to 8.00 metres, during the reporting period. This level shows 0.33 metres lower than its maximum level and 2.47 metres higher than its LTA value.

Being situated between the upstream (Nam Beng, Nam Ou, Nam Suong, and Nam Khan) and downstream (Xayaburi) hydropower dams, the Luang Prabang station has a unique characteristic as it is influenced by the operations of all its surrounding dams. **Thus, the water level at this station can possibly change very rapidly during the wet and dry seasons**.

Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand (downstream of Xayaburi Dam) increased from 3.96 metres to 4.52 metres during this week, showing 0.90 metres above its LTA value. This situation is probably influenced by Xayaburi dam operation. It also noted that water levels downstream at Vientiane increased from 1.63 metres to 2.00 metres, showing 0.92 metres higher than its LTA that close to historical maximum level. However, water levels at Nong Khai are about 0.26 metres below its LTA, while the water level at Paksane is about 0.49 metres lower than its historical minimum level. This low water level has been observed since 4 January 2021 (6 weeks up to today), considered as very critical**. Fluctuated water levels at Chiang Khan and Paksane are shown in** Figure 7 .

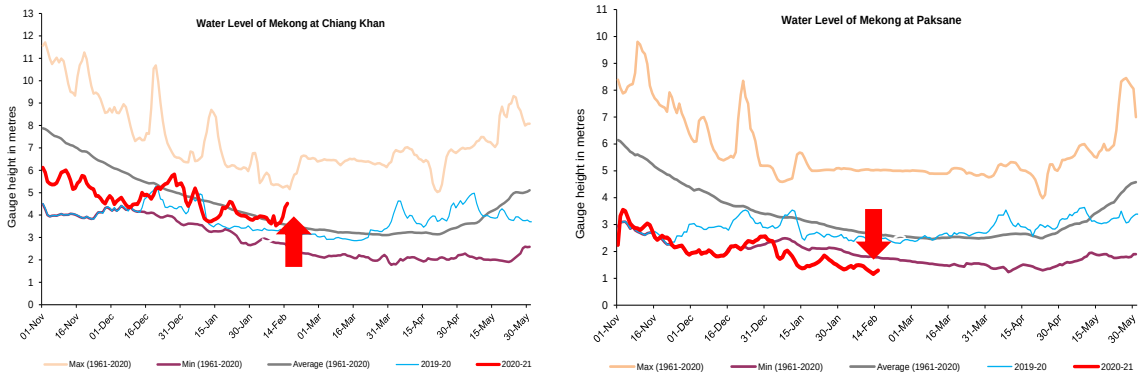


Figure 7: Water levels at Chiang Khan and Paksane in Thailand and Lao PDR.

Nakhon Phanom to Pakse

Water levels from Nakhon Phanom to Mukdahan in Thailand slightly decreased by about 0.15 metres, except at Pakse in Lao PDR which increased about 0.03 metres during the reporting period. The weekly water levels at Nakhon Phanom to Mukdahan were lower than their LTAs but at Pakse was right close to its LTA, as shown in Figure 8.

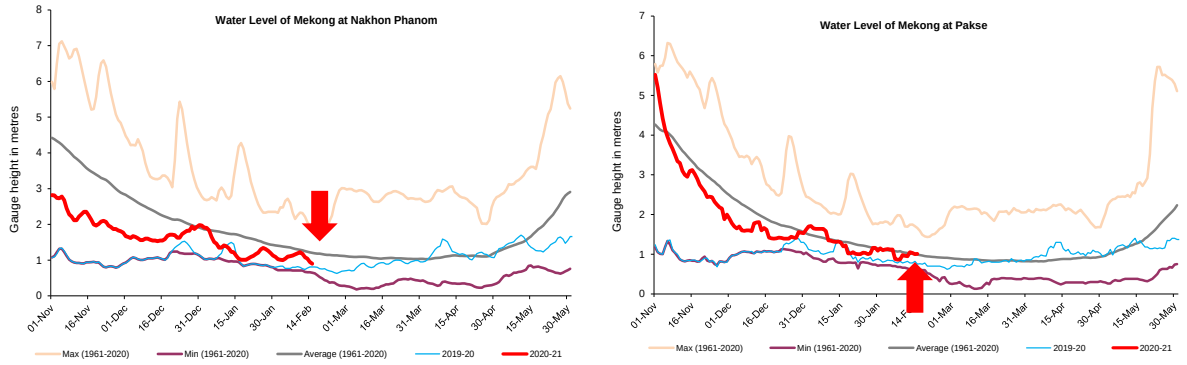


Figure 8: Water levels at Nakhon Phanom and Pakse of Thailand and Lao PDR.

Stung Treng to Kampong Cham/Phnom Penh to Koh Khel/Neak Luong

With contribution of flows from the upstream part of the Mekong River and the 3S river (Sekong, Se San and Sre Pok), the water levels at Stung Treng and Kratie in Cambodia slightly increased accordingly. However, this week water levels were about 0.30 metres higher than their LTAs, as shown in Figure 9.

Water levels in Cambodia's Kompong Cham, Neak Luong on the Mekong River, Koh Khel on the Bassac River and Prek Kdam on the Tonle Sap River were decreased, remaining lower than their LTAs. The decrease was about 0.25 metres during this reporting week. However, water levels at Neak Luong rapidly fluctuated between -0.42 metre and 0.58 metre, that might be influenced by the downstream tidal.

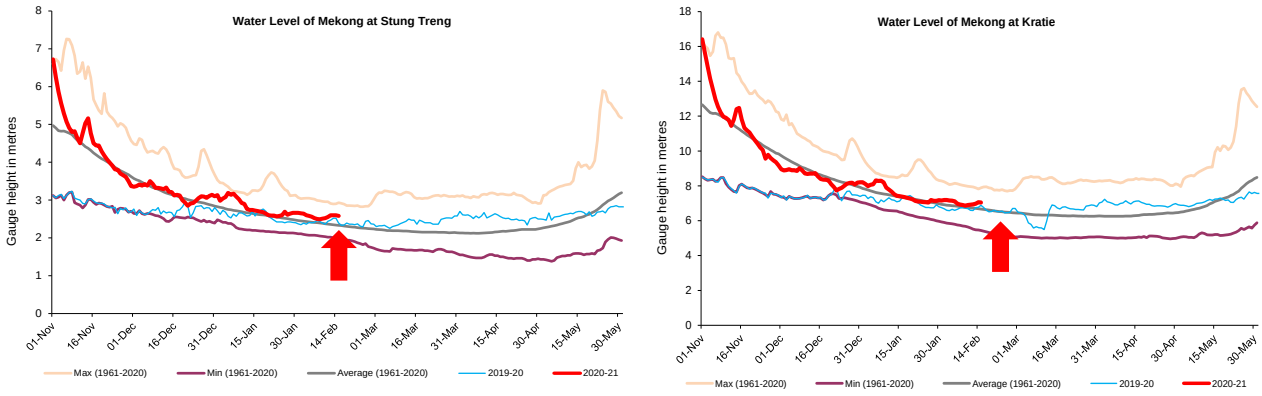


Figure 9: Water levels at Stung Treng and Kratie on the Mekong River.

Tidal stations at Tan Chau and Chau Doc

Like last week, from 9 to 15 Feb 2021, water levels at the two stations of Viet Nam's Tan Chau and Chau Doc were fluctuating over their LTAs due to daily tidal effects from the sea.

The Tonle Sap Flow

At the end of the wet season, when water levels along the Mekong River decrease, flows of the Tonle Sap Lake (TSL) returns to the Mekong mainstream and then to the Delta. This phenomenon normally takes place from mid-October to early November. The delay of the outflow was due to the heavy rain from last October in some of the inflow tributaries around the TSL area.

Figure 10 shows the seasonal changes of the inflow/reverse flow and the outflow of the TSL at Prek Kdam in comparison with the flows of 2018 and 2019, and their LTA level (1997–2019). Up to 15 February 2021 of this reporting period, **it is observed that the main outflow from the TSL has started since 15 November 2020**. The outflow condition in late 2020 was lower than its average flows but higher than the 2019's flow. From next week, the outflow is expected to gradually decrease, due to water levels at downstream parts of the Mekong and Bassac rivers are lower than their LTAs levels which can extract flow from the Lake.

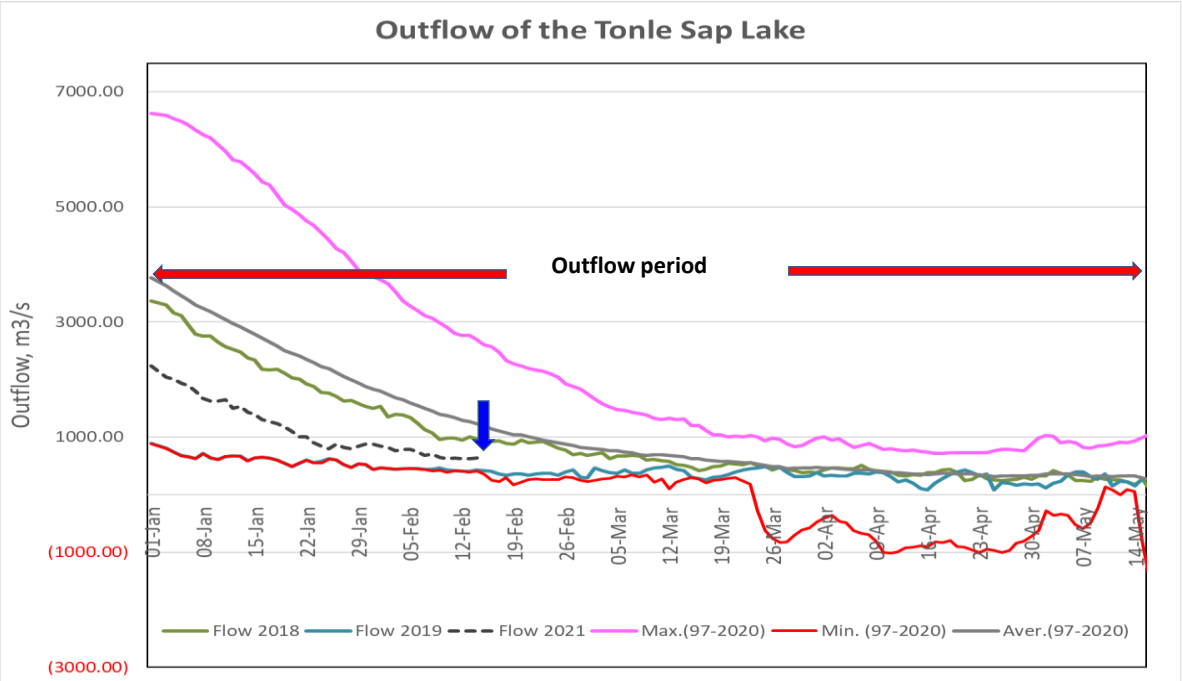


Figure 10: Seasonal change of inflows and outflows of Tonle Sap Lake.

The water volume of the Lake up to this point has been considered critical as it is still lower than its long-term average level. Figure 11 shows seasonal changes in monthly flow volumes up to February 15 for the TSL compared with the volumes in 2018 and 2019 and their LTA and the fluctuating levels (1997–2019). **It shows that up to 15 February the water volumes of the Lake were slightly higher than those of 2019 but lower than those of 2018 during the same period**. This is clearly evidenced in Table 1, which indicates that the TSL has been affected by water levels from the Mekong River, the tributaries, and rainfall in the surrounding sub-catchments.

The increased inflows (inflows from the Mekong River and tributaries) of the TSL in October of the 2020 wet season have resulted in a higher flow in 2020 than in 2019. This demonstrates

the influence of the relationships between the reverse flows, water levels of the Mekong River, inflows from tributaries and the flow direction in the complex hydraulic environment of the TSL during the wet season. The data show that about half of the annual inflow volume into the Lake has originated from the Mekong mainstream. Thus, flow alterations in the mainstream could have direct impacts on the Tonle Sap Lake water levels and on its hydrology.

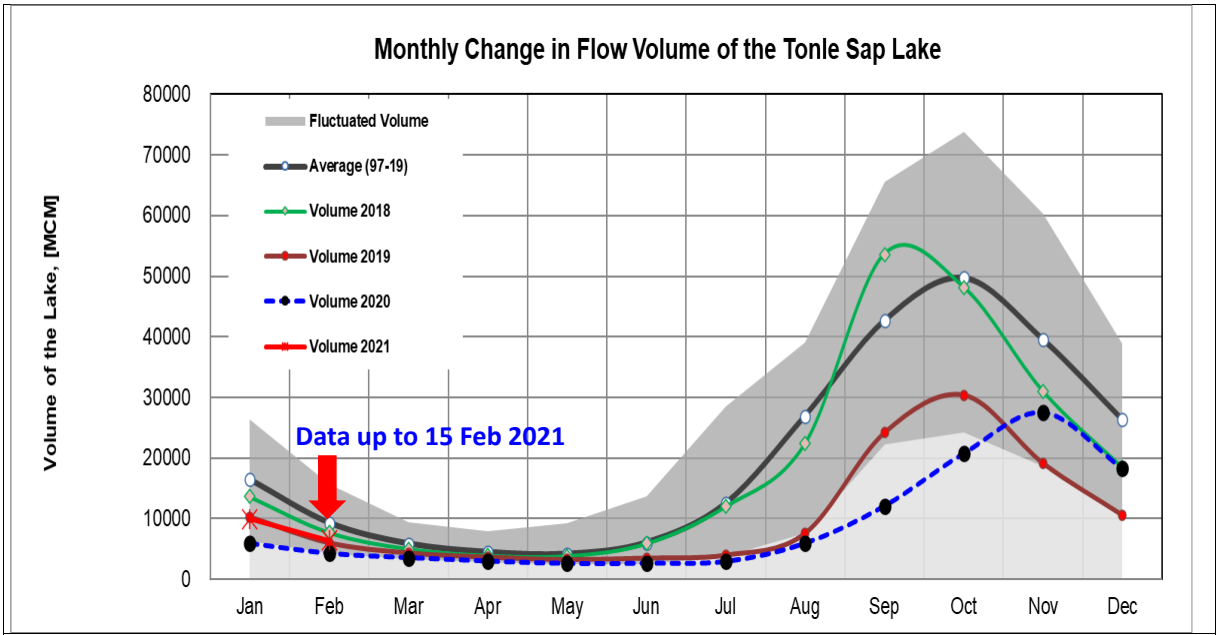


Figure 11: The seasonal change in monthly flow volume of Tonle Sap Lake.

Table 1. The monthly change in the flow volume of Tonle Sap Lake.

Month	Average Volume (97-19) [MCM]	Max Volume [MCM]	Min Volume [MCM]	Volume 2018 [MCM]	Volume 2019 [MCM]	Volume 2020 [MCM]	Volume 2021 [MCM]
Jan	16452.95	26357.53	6272.01	13633.41	10285.31	5906.80	9923.80
Feb	9312.36	15596.22	4281.41	7729.72	6019.30	4264.19	6443.98
Mar	5868.92	9438.24	3350.92	5037.06	4354.62	3553.99	
Apr	4474.98	8009.14	2875.42	3956.47	3667.47	2992.61	
May	4166.07	9176.93	2417.81	3864.00	3266.43	2594.92	
Jun	6034.10	13635.01	2470.54	5919.18	3517.06	2641.88	
Jul	12502.58	28599.56	3832.51	12024.96	4001.99	2925.86	
Aug	26934.35	39015.12	7554.93	22399.65	7622.71	5941.07	
Sep	42644.05	65632.35	22180.73	53639.54	24194.19	12105.31	
Oct	49698.19	73757.23	24276.79	48193.08	30358.38	20799.13	
Nov	39542.58	60367.33	18576.01	31036.07	19112.65	27546.80	
Dec	26325.13	38888.95	10869.43	18469.21	10577.29	18251.65	
	Critical situation, comapred with historical Min values						
	Normal condition, compared with LTA (Long term average)						
	Low volume situation, comapred with LTA values						
Unit: Million Cubic Meter (1 MCM= 0.001 Km^3)							

4 Flash Flood in the Lower Mekong Basin

From 9 to 15 February 2021, the LMB was affected by two main weather factors. These include (i) the active high pressure from China which extended its ridge over the upper and middle parts of the LMB causing some cold weather in the northern and north-eastern areas; and (ii) the strong northeast monsoon which prevailed over the Gulf of Thailand.

According to the MRC-Flash Flood Guidance System (FFGS) and analysis, flash flood events were not detected in the LMB.

5 Drought Monitoring in the Lower Mekong Basin

Weekly drought monitoring from 6 to 12 February 2021

Drought monitoring data for 2021 are available from Saturday to Friday every week; thus, the reporting period is normally three days delayed compared to Flood and Flash Flood reports.

- **Weekly Standardised Precipitation Index (SPI1)**

Drought condition of the LMB from 6 to 12 February 2021, as shown in Figure 12, was normal in most parts. Meteorological indicator of SPI shows that the LMB received little rain in the northern part during the monitoring week and was normal compared with its historical records. The condition was very much similar to last week (30 Jan to 5 Feb 2021).

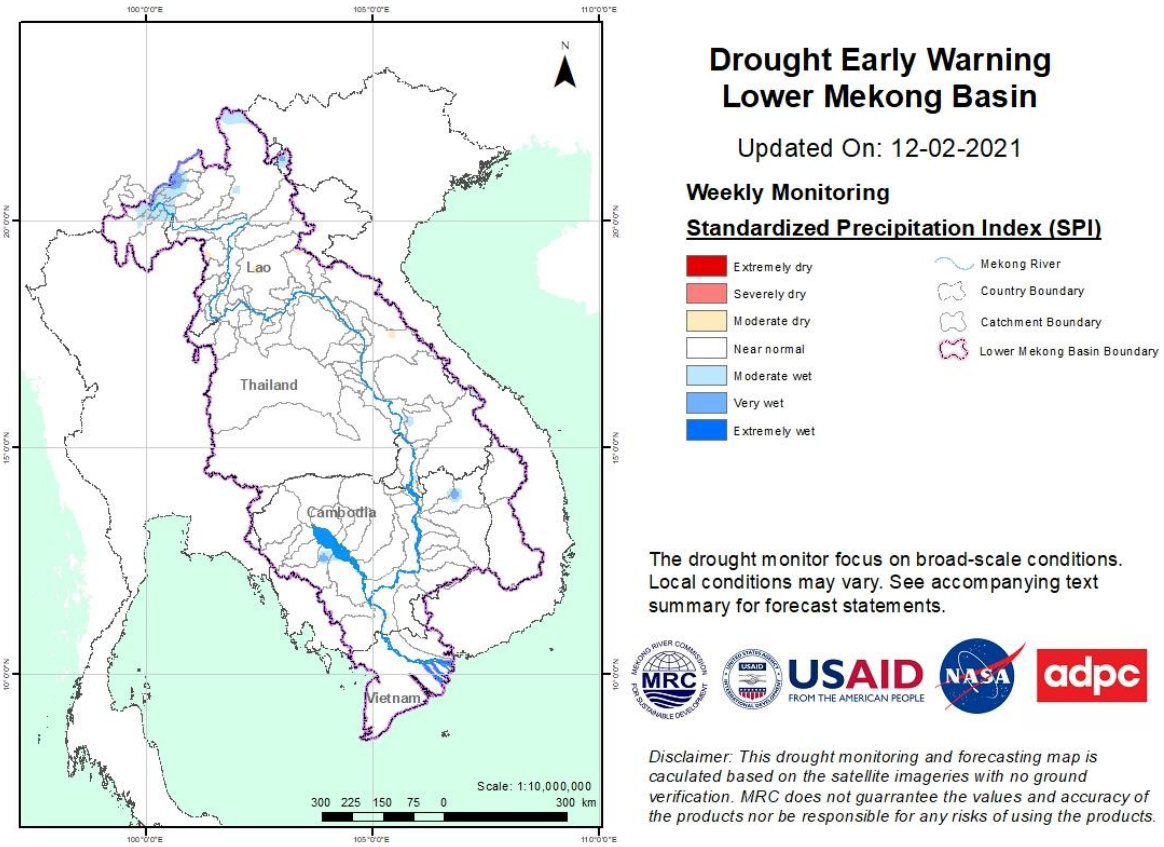


Figure 12: Weekly standardized precipitation index from 6 to 12 Feb 2021.

- **Weekly Soil Moisture Anomaly (SMA)**

Soil moisture condition from 6 to 12 February 2021, as displayed in Figure 13, was very much different from the condition last week (Jan 30 to Feb 5). The moderate dry soil moisture in the northern and southern of the LMB during the past weeks were replaced by normal and wet ones. The overall condition of the soil moisture of the LMB during the reporting week is normal.

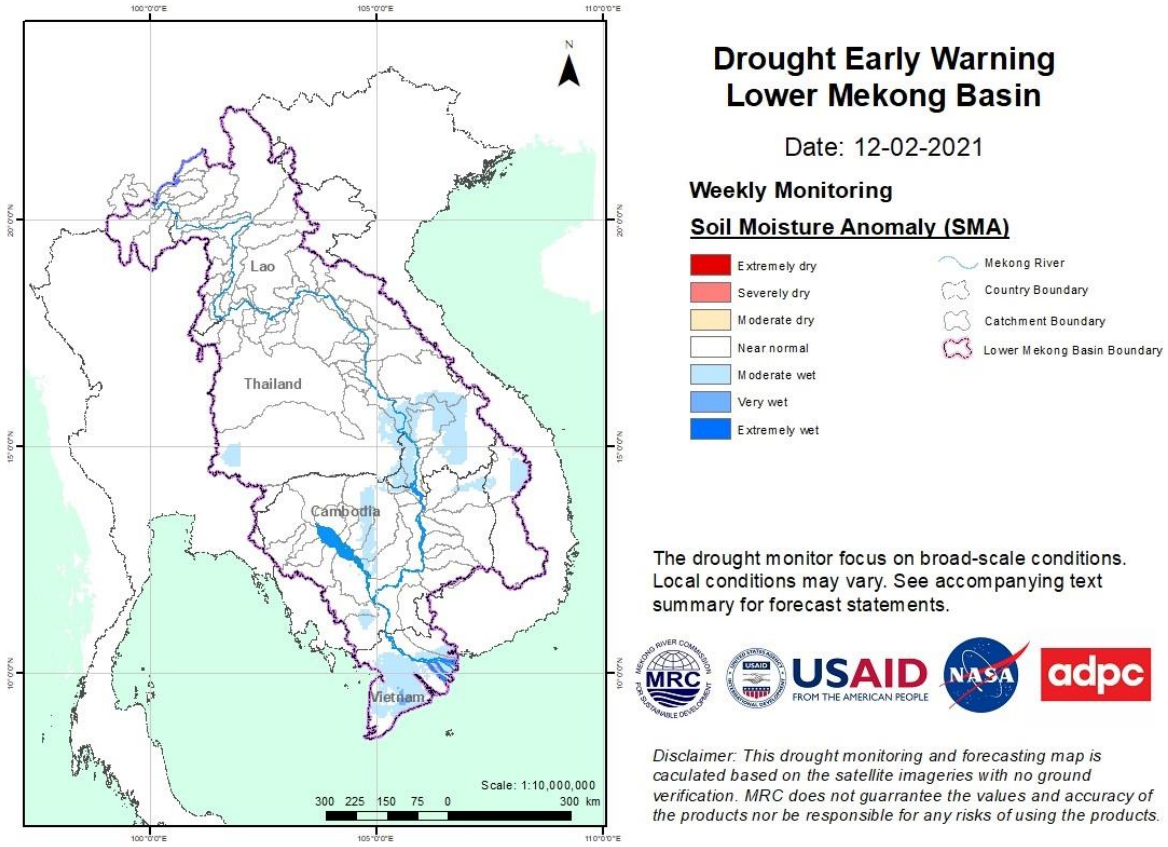


Figure 13: Weekly Soil Moisture Anomaly from 6 to 12 Feb 2021.

- **Weekly Combined Drought Index (CDI)**

The overall drought condition through combined drought index from 6 to 12 February 2021, as displayed in Figure 14, shows no drought threat over the region. The CDI presents normal condition in all LMB areas.

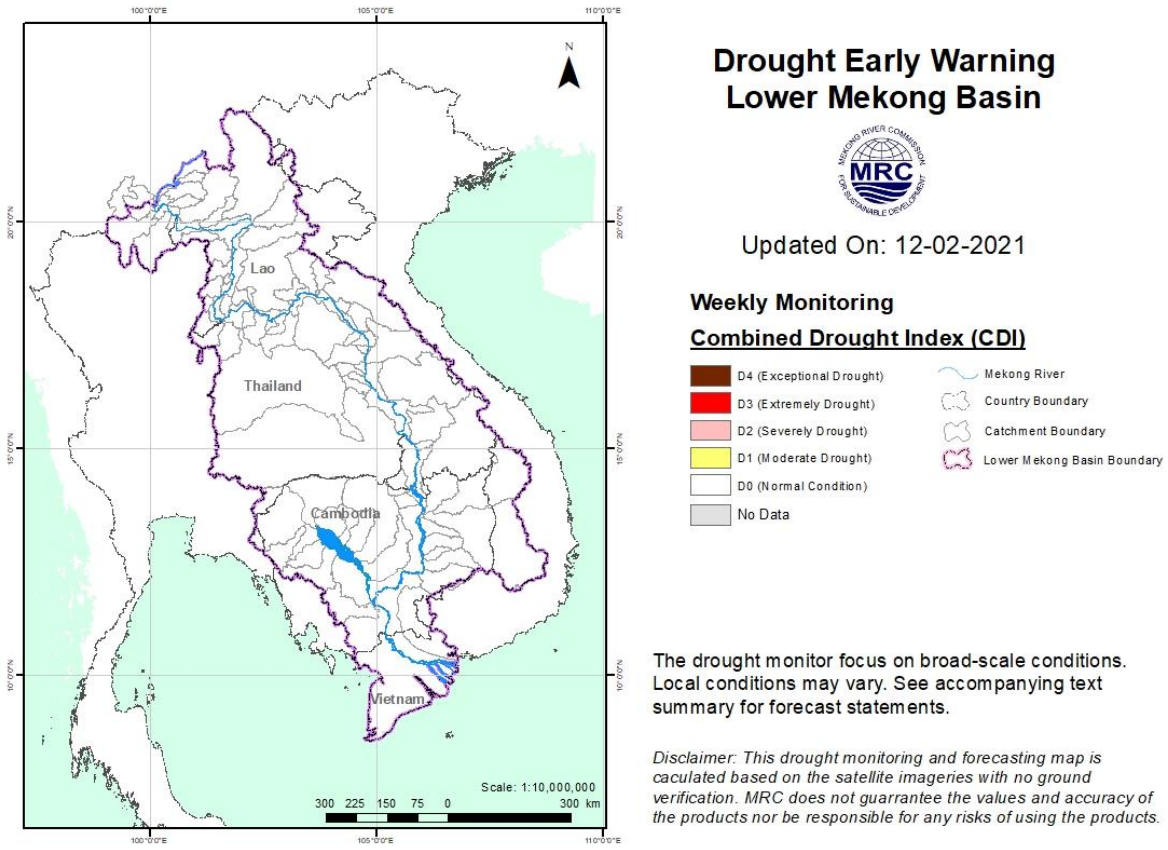


Figure 14: Weekly Combined Drought Index from 6 to 12 Feb 2021.

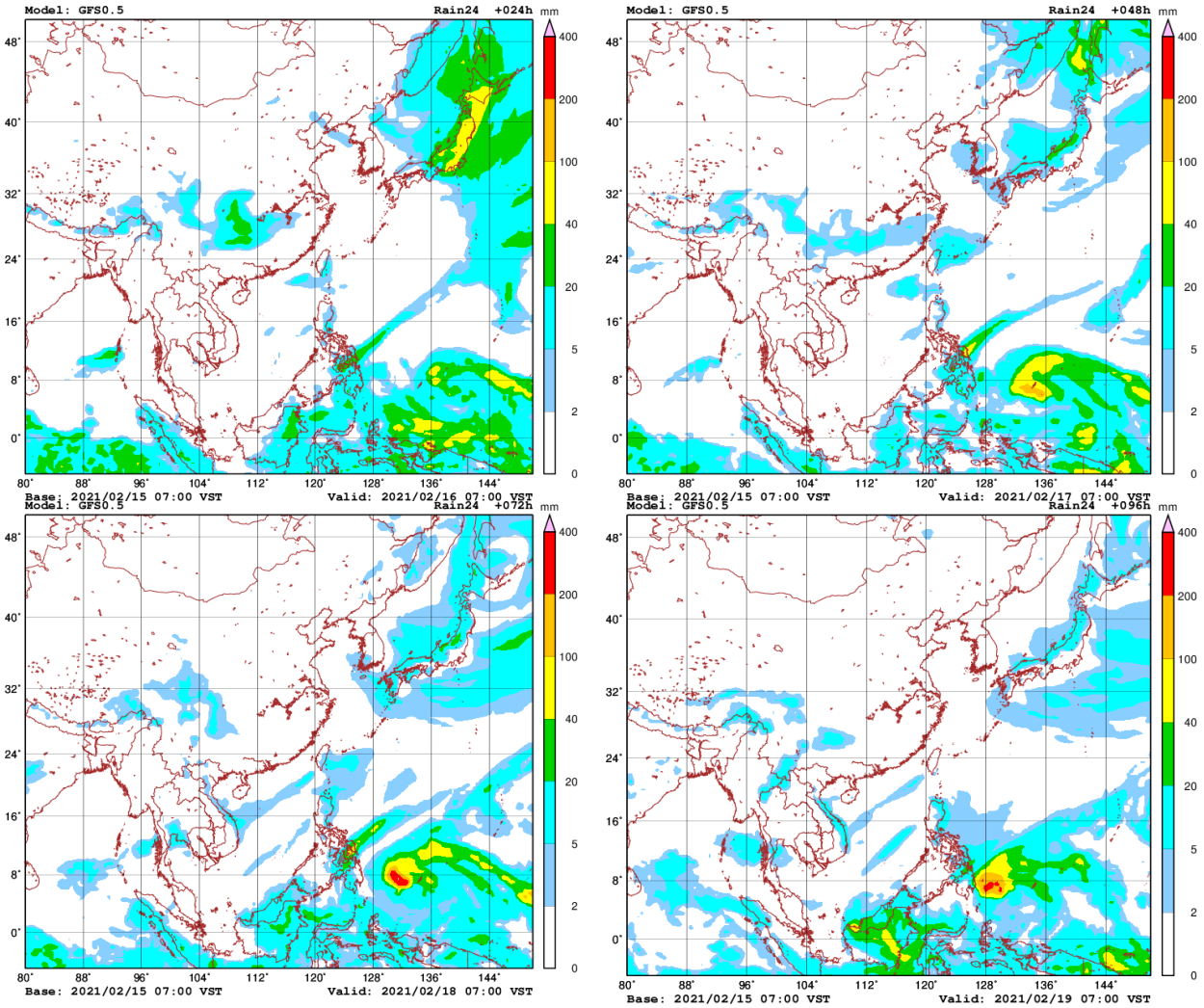
More information on Drought Early Warning and Forecasting (DFEW) as well as the explanation is available here: http://droughtforecast.mrcmekong.org/templates/view/our-product. DFEW provides not only weekly monitoring and forecasting information but also three-month forecasts of drought indicators with seasonal outlook which are usually updated every month based on international weather forecast models. Details on drought forecast is described in section 6.4 of this report.

6 Weather and Water Level Forecast and Flash Flood Information

6.1 Weather and rainfall forecast

Based on the analysis of the synoptic meteorological information and result from the Global Forecast System (GFS) Model, in the coming week, there might be two factors affecting the LMB, as have been the case. They include (i) high pressure from China moving over to the LMB areas, and (ii) the on-going prevailing northeast monsoon from the Gulf of Thailand to the lower part of the LMB. From 16 to 22 Feb, very small rainfall (2–5 mm/24 hrs) may take place in some areas of the LMB.

Figure 15 shows accumulated rainfall forecast (24 hrs) of the GFS model from 16 to 22 Feb 2021.



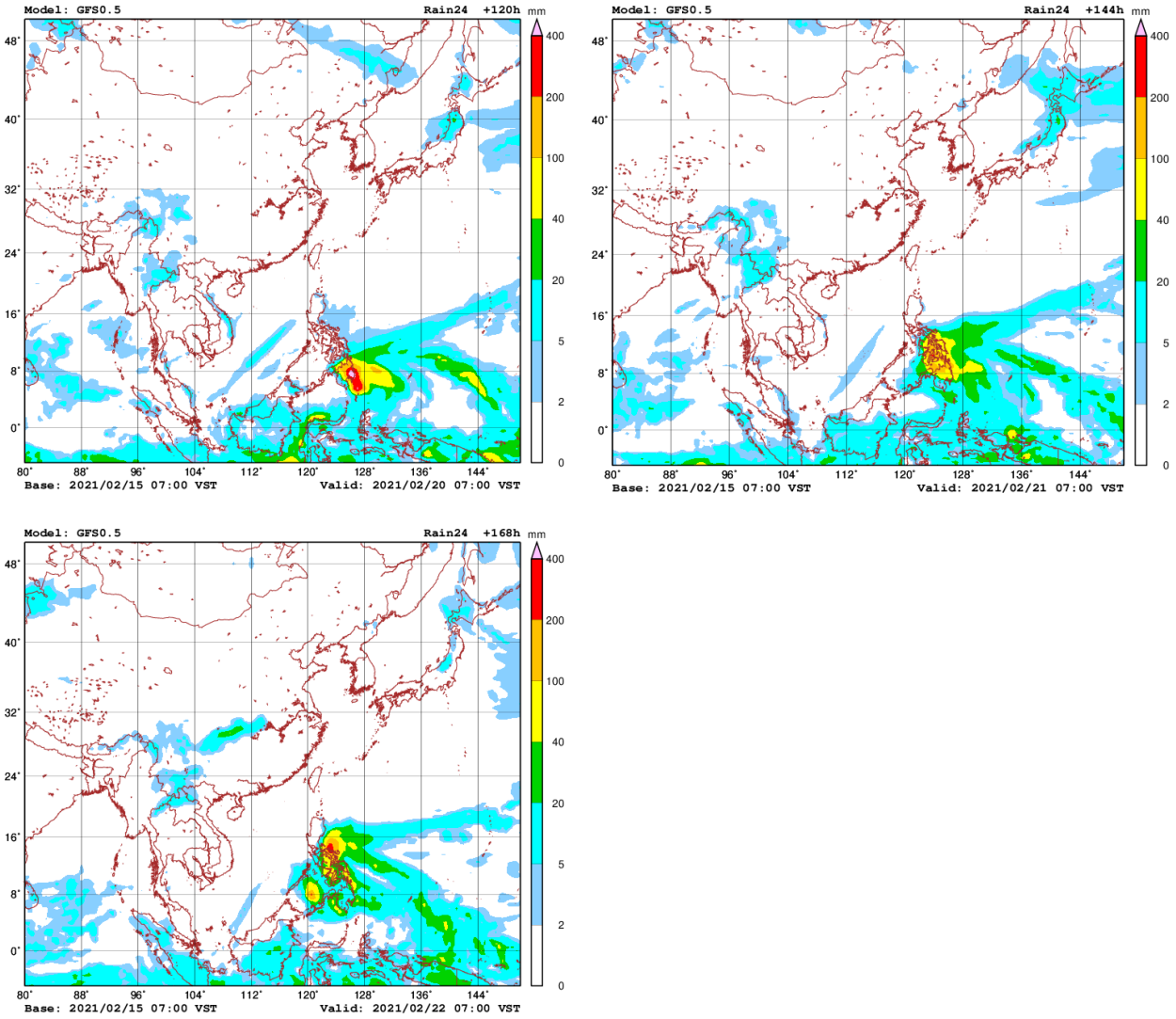


Figure 15: Accumulated rainfall forecast (24 hrs) of model GFS.

6.2 Water level forecast

Chiang Saen and Luang Prabang

Based on February 15's weekly river monitoring bulletin, the weekly forecast water level at Chiang Saen in Thailand is expected to slightly increase from 1.90 metres to 2.08 metres in the next seven days. The trend of water levels at this station will continue staying above its LTA.

For Luang Prabang in Lao PDR, the water level will slightly increase from 8.05 metres to 8.28 metres during the same period. The current water level is higher than its maximum value. Unlike last week, some rainfall is forecasted between Chiang Saen and Luang Prabang for next week.

Chiang Khan, Vientiane-Nong Khai and Paksane

The water level at Chiang Khan in Thailand is forecasted to go down by about 0.20 metres, while at Vientiane in Lao PDR the water level is also forecasted to decrease by about 0.12 metres. From Nong Khai to Paksane, water levels will also slightly decrease by about 0.07

metres in the next seven days. No precipitation is forecasted for the areas between Chiang Khan and Paksane for next week.

The water levels will remain higher than its LTA at Chiang Khan and Vientiane, while at Nong Khai they will continue staying lower than their LTAs. And at Paksane the water level will be lower than its minimum level.

Nakhon Phanom to Pakse

Water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR may slightly increase by about 0.15 metres in the next seven days. From Nakhon Phanom to Sovannakhet, water levels will stay below their LTAs, while at Khong Chiam in Thailand to Pakse in Lao PDR the water levels will stay above their LTAs. No precipitation is forecasted for the areas between Nakhon Phanom and Pakse for next week.

Stung Treng to Kampong Cham/Phnom Penh to Koh Khel/Neak Luong

From Stung Treng to Neak Luong along the Mekong River in Cambodia, water levels will slightly increase by about 0.10 meters in the next seven days, with some rain forecasted for the surrounding areas.

Water levels of the Tonle Sap Lake at Prek Kdam and Phnom Penh Port, as well as at Phnom Penh, Chaktomuk, and Koh Khel on the Bassac River, will decrease by about 0.15 metres over the next seven days.

With the trend, water levels at these stations will continue staying below their LTA levels, particularly from the Kompong Cham and Bassac at Phnom Penh to Neak Luong as well as Tonle Sap at Prekdam to Phnom Penh Port. Small amount of precipitation is forecasted for the low-lying area of Cambodia next week. However, water levels at Neak Luong will be fluctuating according to the influence of downstream tidal.

Tidal stations at Tan Chau and Chau Doc

For Viet Nam's Tan Chau on the Mekong River and Chau Doc on the Bassac River, water levels will be fluctuating around their LTAs, following daily tidal effects from the sea. Some rainfall is forecasted for the Delta area for next week.

Table 2 shows the weekly River Monitoring Bulletin issued on February 15. Results of the started weekly river monitoring bulletin are also available at http://ffw.mrcmekong.org/bulletin_wet.php.

6.3 Flash Flood Information

Flash flood events are likely not to happen in the LMB within next week. During the dry season if extreme weather occurs, the information on flash flood guidance for the next one, three, and six hours is updated at http://ffw.mrcmekong.org/ffg.php.

Further detailed information on Flash Flood Information Warning, as well as on its explanation, is available for download here.

6.4 Drought forecast

There are several climate-prediction models with different scenarios on the upcoming months until June 2021. The MRC's Drought Forecasting and Early Warning System (DFEWS) adopts an ensemble model, which averages all scenarios called the North America Multi-Model Ensemble (NMME).

The global scale of rainfall prediction is used to see how the rain distribution looks like for the coming months. Figure 16 shows the ensemble mean of daily average precipitation (mm/day) each month from March to June 2021 produced by the NMME.

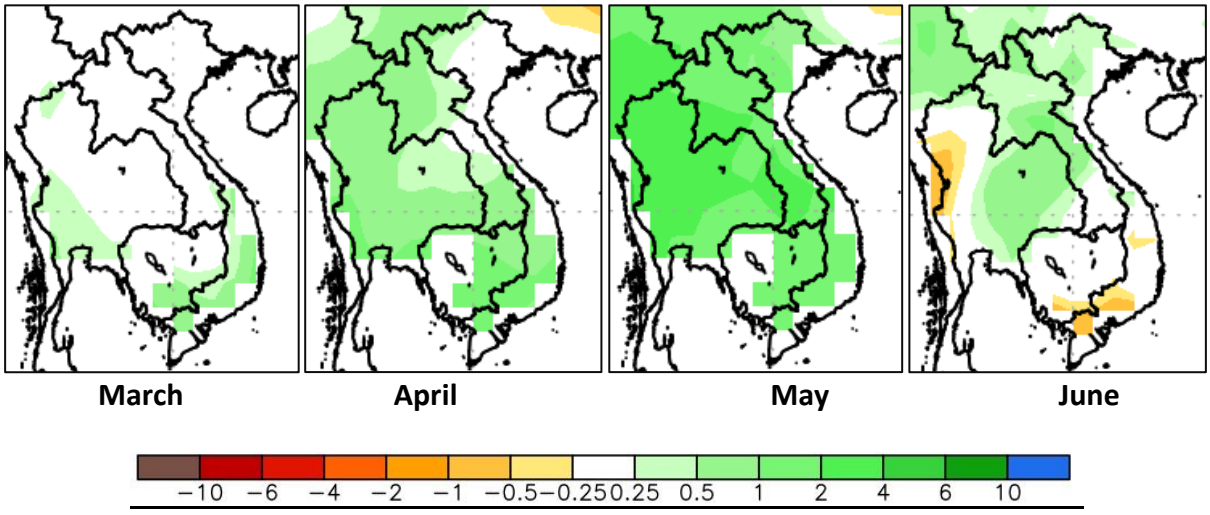


Figure 16: Daily average of monthly rainfall anomaly forecast from Mar to June 2021.

Since the dry season has already begun, the LMB is not going to receive any significant rain from January to April 2021. The ensemble prediction model forecasts that the LMB is likely to receive some little rain in February and March mainly in the Central Highland of Viet Nam and south-eastern part of Cambodia. The initial forecast shows some rain in April covering Cambodia, Lao PDR, Thailand, and Viet Nam. It seems that dry season this 2021 is wetter than last year 2020 and rain might come early in the wet season than in 2019 and 2020.

The forecasted combined drought index in Figure 17, a combination of forecasted rainfall and soil moisture, shows some severe and extreme drought conditions in the northern part of the LMB during this coming February 2021. Dry soil moisture is the main cause of such phenomenon. Those drought conditions cover Chiang Mai, Chiang Rai, Phayao, Bokeo, Luangnamtha, Oudomxay, Phongsaly, Luang Prabang, and Borikhamxay. This might cause some trouble to agriculture if dry season crops are practicing in the areas. Fortunately, in March and April, the overall drought condition is likely normal.

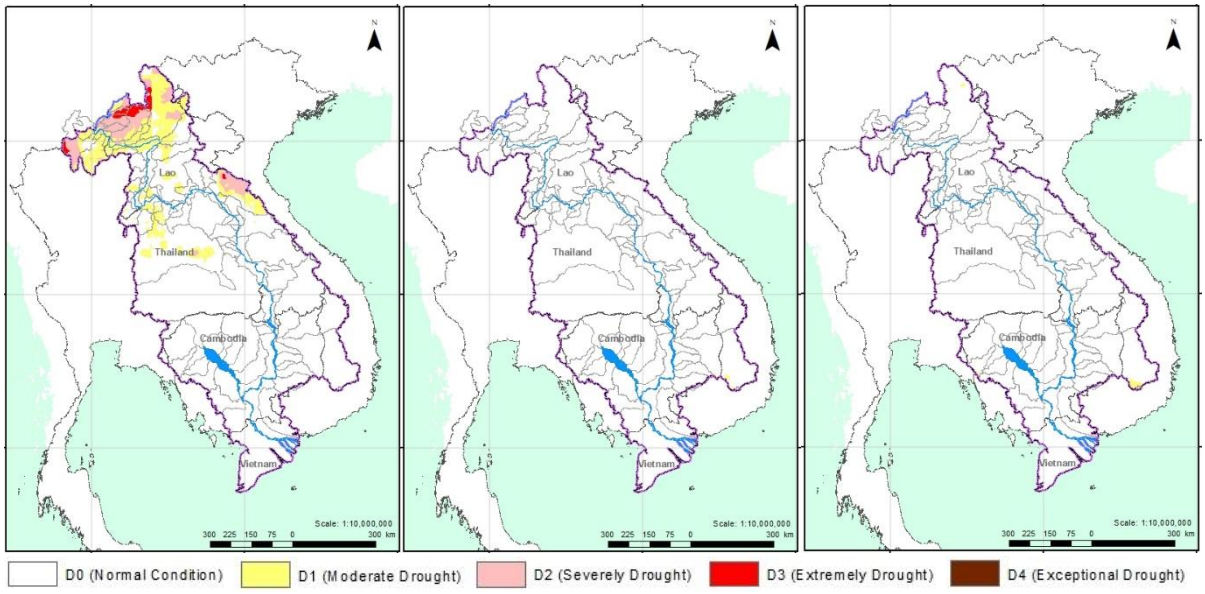


Figure 17: Monthly drought forecast for Feb, Mar, and Apr 2021

Table 2. Weekly River Monitoring Bulletin.

Mekong Bulletin

Mekong River Commission Secretariat (MRCS)
Regional Flood and Drought Management Centre (RFDMC)
P.O. Box 623 #576, National Road #2, Chak Angre Krom, Meanchey, Phnom Penh, Cambodia
Tel: (855-23) 425353, Fax: (855-23) 425363, Email: floodforecast@mrcmekong.org

Forecast period from: 16 February to 22 February 2021

Date: 15 February 2021

LOCATION	Country	Observed Rainfall (mm)	Zero gauge above M.S.L (m)	Min water level against zero gauge (m)	Observed W. level against zero gauge (m)		Forecasted Water Levels (m)						
		14-Feb			14-Feb	15-Feb	16-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb
Jinhong		0.0	-	-	535.60	535.60							
Chiang Saen		0.0	357.110	0.00	1.92	1.88	1.90	1.93	1.95	1.98	2.01	2.05	2.08
Luang Prabang		0.0	267.195	2.53	7.94	8.00	8.05	8.07	8.12	8.17	8.21	8.25	8.28
Chiang Khan		0.0	194.118	1.91	4.35	4.52	4.56	4.52	4.50	4.45	4.42	4.40	4.35
Vientiane		0.0	158.040	-0.28	1.80	2.00	2.12	2.15	2.12	2.10	2.06	2.02	2.00
Nongkhai		0.0	153.648	0.33	1.12	1.34	1.47	1.52	1.49	1.46	1.42	1.37	1.35
Paksane		0.0	142.125	0.10	1.23	1.29	1.40	1.46	1.49	1.47	1.45	1.43	1.40
Nakhon Phanom		0.0	130.961	0.18	0.95	0.90	0.94	1.00	1.03	1.05	1.04	1.02	1.00
Thakhek		0.0	129.629	1.38	2.32	2.29	2.35	2.41	2.45	2.48	2.46	2.44	2.41
Mukdahan		0.1	124.219	0.72	1.56	1.54	1.52	1.56	1.60	1.63	1.65	1.63	1.62
Savannakhet		0.0	125.410	-0.65	1.06	1.07	1.07	1.05	1.07	1.09	1.10	1.11	1.09
Khong Chiam		0.0	89.030	1.02	2.03	2.01	1.96	1.91	1.97	2.03	2.07	2.12	2.08
Pakse		0.0	86.490	0.03	1.00	1.01	0.99	0.97	1.00	1.03	1.05	1.07	1.05
Stung Treng		nr	36.790	0.32	2.60	2.58	2.56	2.54	2.52	2.55	2.58	2.6	2.62
Kratie		nr	-1.080	3.06	7.06	7.04	7.01	6.97	6.94	6.91	6.95	6.99	7.02
Kompong Cham		nr	-0.930	0.65	2.78	2.82	2.80	2.77	2.72	2.68	2.64	2.69	2.75
Phnom Penh (Bassac)		nr	-1.020	1.58	2.15	2.16	2.15	2.13	2.11	2.09	2.07	2.09	2.12
Phnom Penh Port		nr	0.000	0.14	1.18	1.19	1.18	1.16	1.14	1.12	1.10	1.12	1.15
Koh Khel		nr	-1.000	1.52	2.06	2.16	2.19	2.21	2.25	2.23	2.20	2.17	2.14
Neak Luong		nr	-0.330	0.81	1.73	1.58	1.60	1.59	1.58	1.57	1.55	1.53	1.51
Prek Kdam		nr	0.080	0.58	1.24	1.32	1.35	1.33	1.31	1.29	1.27	1.25	1.27
Tan Chau		0.0	0.000	-0.37	1.08	0.71	0.51	0.34	0.17	0.25	0.44	0.73	0.98
Chau Doc		nr	0.000	-0.60	1.28	0.86	0.66	0.51	0.34	0.45	0.68	1.00	1.26

REMARKS:

-: not available.
*: reference stations without forecast.
nr: no rain.

River Flood Forecaster

KHEM Sothea

NOTE: Discharge at Luang Prabang may be influenced by hydropower operations (at both upstream and downstream).
For more info, please refer to this link:
http://www.mrcmekong.org/; http://ffw.mrcmekong.org/bulletin_wet.php; http://ffw.mrcmekong.org/reportflood.php

7 Summary and Possible Implications

7.1 Rainfall and its forecast

During this reporting week, rainfall presented between 10 mm and 74 mm at key stations along the Mekong mainstream from Thailand's Chiang Saen to Tan Chau and Chau Doc in Vietnam. Based on the forecasted satellite data, rainfall is forecasted for some areas of the LMB from 10 to 50 mm for the next 7 days.

The forecasted model using GFS data, on the other hand, also shows that no significant rainfall (>50mm) is likely to take place in the Mekong region from 16 to 22 February 2021.

7.2 Water level and its forecast

China notified the Mekong River Commission on January 5 stating that Jinghong Dam would release outflows at 1,000 cubic meters per second (m^3/s) from January 5 to 24 for power grid maintenance. This is a significant decrease of water level from its original amount of 536.73 metres on 31 December 2020 down to 535.53 metres on 1 January 2021. Furthermore, between January 29 and February 15, the water level was reduced from 535.99 metres to 535.60 metres. It seems that China's Jinghong Dam is still restricting the release to the Mekong downstream.

The increased water level at Jinghong of about 0.42 metres from January 5 to 25 has made water levels at both Thailand's Chiang Saen and Lao PDR's Vientiane higher than their LTAs. This means that the practices of Jinghong Hydropower during January 4-24 have significant impacts on the water flow and water levels at Chiang Saen areas.

Water levels from Chiang Khan to Vientiane in Thailand and Lao PDR will likely be affected by Xayaburi dam in the next few weeks.

The starting date of the outflow from the Tonle Sap Lake into the Mekong mainstream took place on November 15, slightly late compared to the normal event. Due to heavy rainfall in late October 2020, the water volume of the Lake at this reporting point is higher than that in 2019. However, it is lower than its LTA which is considered critical.

Over the next few days, water levels across most monitoring stations from Chiang Khan to Vientiane are expected to slightly decrease about 0.10 metres but increase about 0.15 from Nakhon Phanom to Pakse. This situation continues to put most stations' water levels below their LTAs.

From Stung Treng to Kratie, the water levels slightly increased and remained above their LTAs except from Komgpong Cham to Neak Luong on the Mekong, Prek Kdam to Phnom Penh Port on the Tonle Sap, and Chaktomuk to Koh Khel on the Bassac, the water levels are below their LTAs. It was noted that water levels at Neak Luong rapidly fluctuated between -0.42 metres and 0.58 metres during this report period. It is inferred that the rapid change is caused by the downstream tidal effect.

The situation in Tan Chau on the Mekong River and Chau Doc on the Bassac River is expected to remain unchanged.

The low rainfall during the past months in 2020 (except in October) is believed to be one of the main factors causing low water levels at most of the stations along the Mekong mainstream.

Since the beginning of this year (2020), water levels in the LMB have been lower than their LTAs for all monitoring stations (from upper to lower stretches within the LMB). Like many parts of the world, the Mekong region has been affected by the prolonged El Nino event, the phenomenon that usually causes extreme heat and insufficient rainfall. This climate change impact has been observed since 2019. Therefore, the main cause of low water levels in the Mekong mainstream from June to July 2020 could be the unusual low rainfall as results of the climate change affecting the LMB.

For a more complete preliminary analysis of the hydrological conditions in the LMB over January–July 2020, please refer to this Situation Report.

The contribution to the Mekong River's flow from the Upper Mekong Basin in China (Yunnan component) is about 16 % by the time the river discharges through the Mekong Delta into the Sea. By far the major contribution comes from the two major 'left-bank' (Eastern) tributaries between Vientiane – Nakhon Phanom and Pakse – Stung Treng, which together contribute more than 40% of the flows.

7.3 Flash flood and its trends

With the very small predicted amounts of rainfall for the coming week as mentioned earlier in section 6.1, flash floods are likely not to happen in the region.

7.4 Drought condition and its forecast

Drought condition of the LMB from 6 to 12 February 2021 was relatively different from last week (January 30 to February 5). The region showed only normal and wet conditions of both soil moisture and rainfall in the LMB. In general, drought condition was getting much better – with no potential threat – over the region.

For the upcoming three-month forecast, LMB is likely to receive very little rain in February and March mainly in the Central Highland of Viet Nam and south-eastern part of Cambodia. Drought might occur in the northern part of the LMB in this coming February which could cause some problem for dry season crops in the areas due to dry soil moisture.

The initial forecast shows some rain in April covering Cambodia, Lao PDR, Thailand, and Viet Nam. It seems that dry season this 2021 is wetter than last year 2020 and rain might come early in the wet season than in 2019 and 2020.

Annex A: Tables for weekly updated water levels and rainfall at the Key Stations from 9 to 15 February 2021

Table A1: Weekly observed water levels in metres

2020	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
09-02-2021	535.62	2.11	7.80	3.96	1.63	1.02	1.45	1.19	1.63	0.98	2.51	6.86	2.68	2.27	2.25	1.90	1.21	0.93	1.11
10-02-2021	535.58	2.50	7.62	3.53	1.58	0.98	1.36	1.22	1.67	0.96	2.52	6.90	2.70	2.09	2.05	1.80	1.12	1.17	1.34
11-02-2021	535.54	2.50	7.58	3.62	1.55	0.94	1.29	1.18	1.69	0.95	2.55	6.92	2.70	2.05	2.01	1.66	1.12	1.30	1.50
12-02-2021	535.59	2.19	7.54	3.67	1.55	0.94	1.23	1.08	1.65	1.05	2.60	6.94	2.70	2.14	2.00	1.24	1.16	1.35	1.50
13-02-2021	535.60	1.98	7.58	3.92	1.63	1.02	1.16	1.04	1.60	1.03	2.60	6.98	2.80	2.13	1.93	1.82	1.19	1.32	1.47
14-02-2021	535.60	1.92	7.94	4.35	1.80	1.12	1.23	0.95	1.56	1.00	2.60	7.06	2.78	2.15	2.06	1.73	1.24	1.08	1.28
15-02-2021	535.60	1.88	8.00	4.52	2.00	1.34	1.29	0.90	1.54	1.01	2.58	7.04	2.82	2.16	2.16	1.58	1.32	0.71	0.86

Table A2: Weekly observed rainfall in mm

2020	Jinghong	Chiang Saen	Luang Prabang	Chiang Khan	Vientiane	Nongkhai	Paksane	Nakhon Phanom	Mukdahan	Pakse	Stung Treng	Kratie	Kompong Cham	Phnom Penh (Bassac)	Koh Khel	Neak Luong	Prek Kdam	Tan Chau	Chau Doc
09-02-2021	0	74.2	42.8	28	14.2	7.1	13.1	4.3	0	11.4	0	0	0	11.3	0	0	0	0	0
10-02-2021	0	0	0	0	8.5	9.7	24.8	22.5	9.9	13.2	0	0	0	0	0	0	0	0	0
11-02-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.3	2
12-02-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
13-02-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-02-2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-02-2021	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0

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