Mekong River Commission

Weekly Dry Season Situation Report in the Lower Mekong River Basin

15–21 December 2020

Prepared by
The Regional Flood and Drought Management Centre
22 December 2020

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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 **15–21 December 2020**. 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 a 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
- 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 (November, December and January) and the weather maps issued by the Thai Meteorological Department (TMD) were used to verify weather conditions in the LMB.

The data from the TMD predict that instances of low pressure and tropical cyclones may end their effect in the Mekong region from December 2020. Such a condition will reduce rainfall and bring the cold weather in the region (December 2020–January 2021). The TMD also predicts that scattered coldly high-pressure air mass areas from China will prevail over the upper part of the Mekong region.

Figure 1 presents the weather map of 20 December 2020, showing a line of low pressure crossing the lower part of the Mekong region which may bring some rainfall over the next few days.

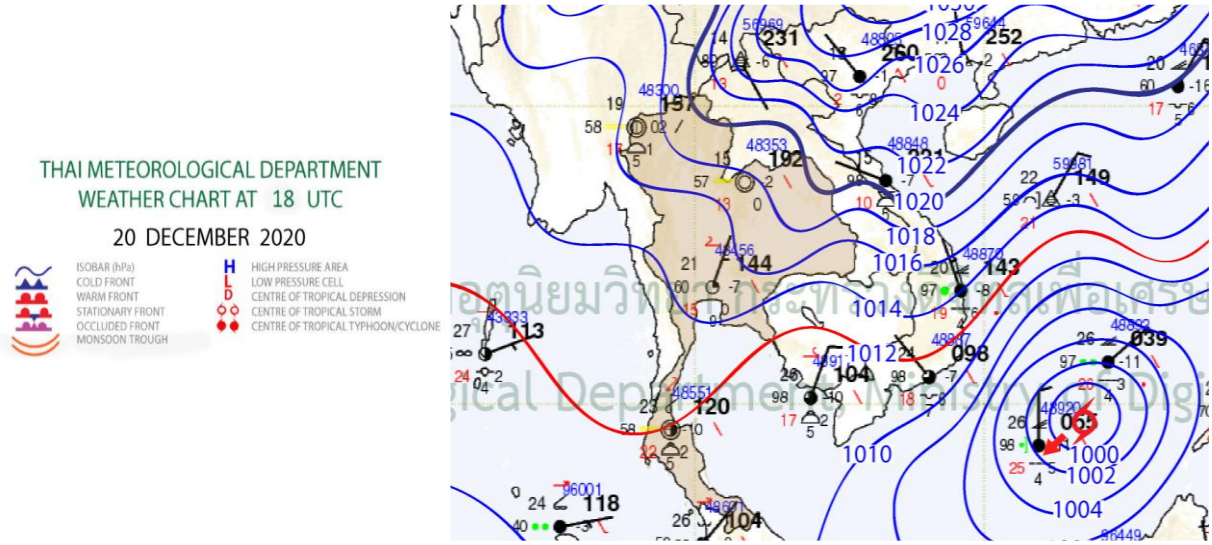


Figure 1: Summary of weather conditions over the LMB.

According to the ASEAN Specialised Meteorological Centre (ASMC), wetter conditions are predicted over the eastern half of Southeast Asia during December 14–27, which can increase a wet condition over the Lower Mekong region mainly in Viet Nam. During this time, the ASMC confirms that the colder and drier conditions may influence the region.

Subsequently, from December 2020 to January 2021, there is a decreasing chance of cold and drier condition for most of Asian countries, especially in the Mekong region. Figure 2 shows the outlook of wet and dry condition from December 14–27 in Southeast Asia based on results from the NCEP model (National Centres for Environmental Prediction).

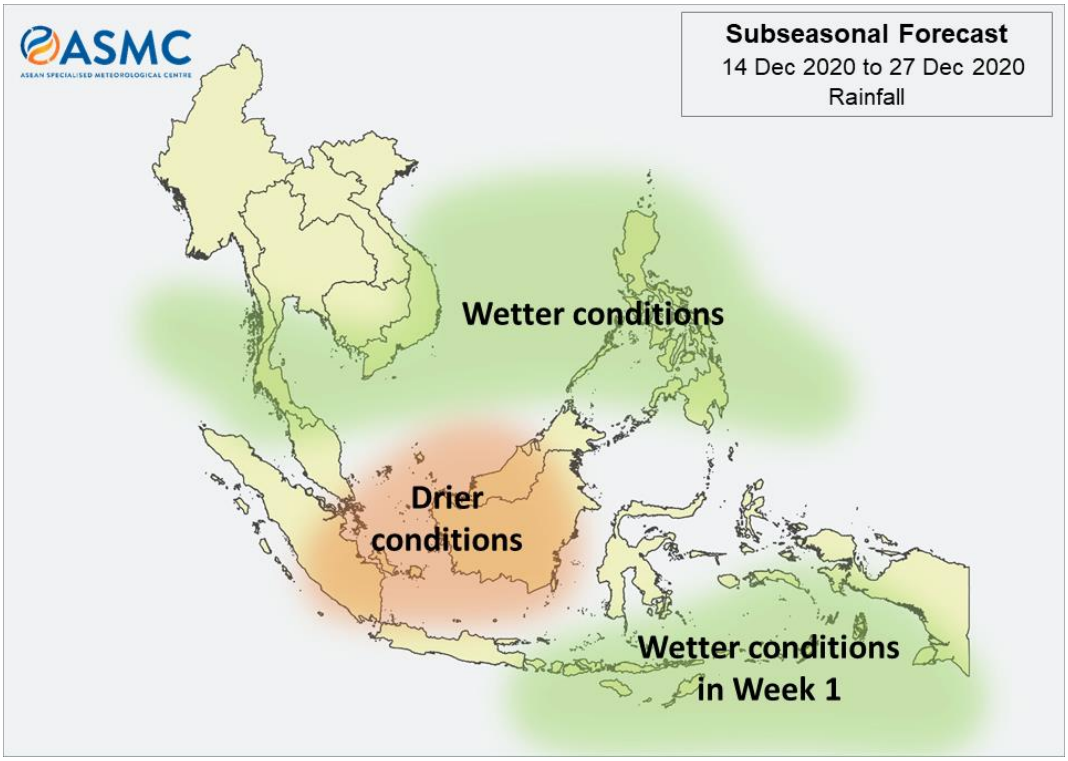


Figure 2: Outlook of wet and dry conditions over the Asian countries by ASMC.

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

There was a low pressure line taking place in the lower part of the LMB during 15–21 December 2020. It is possible that this condition may cause some rain to fall in the LMB. Figure 3 shows the tropical depression (TD) observed on December 21, which is likely taking place in the sea from 21 to 23 December that can probably cause some rainfall in the lower part of the Mekong region in the next few days.

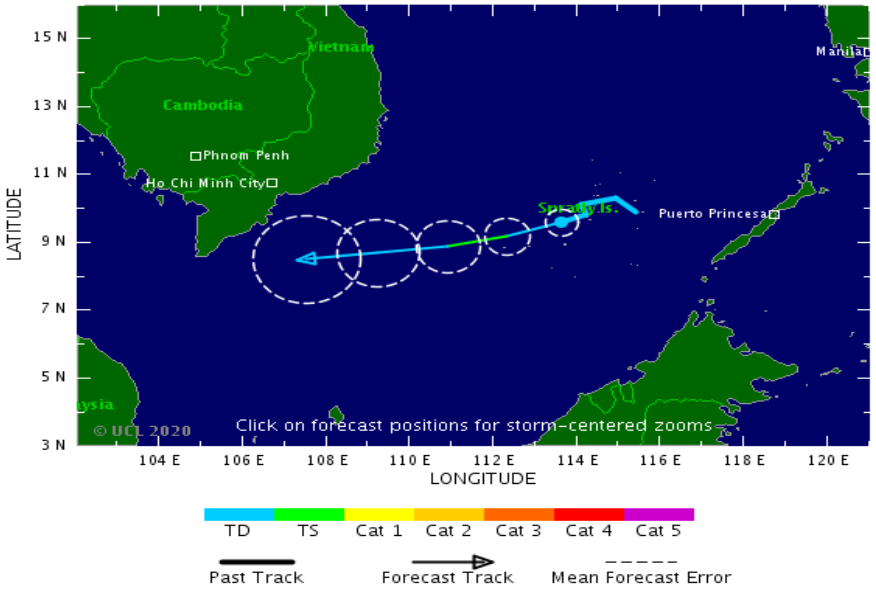


Figure 3: A Tropical Depression risk observed on 21 December 2020.

Rainfall patterns over the LMB

This week, the rain concentrated in the lower part from Cambodia's Neak Luong to Viet Nam's Tan Chau and Chau Doc, varying from 0.7 mm to 12.1 mm. The amount of this rainfall is considered very low. No rain was observed at the upper to the middle parts of the Mekong basin. Compared with last week's amount, the rainfall this week was considered much smaller in the lower part.

The total observed rainfall of the week at key stations, compared with average rainfall in November, are shown in Figure 4.

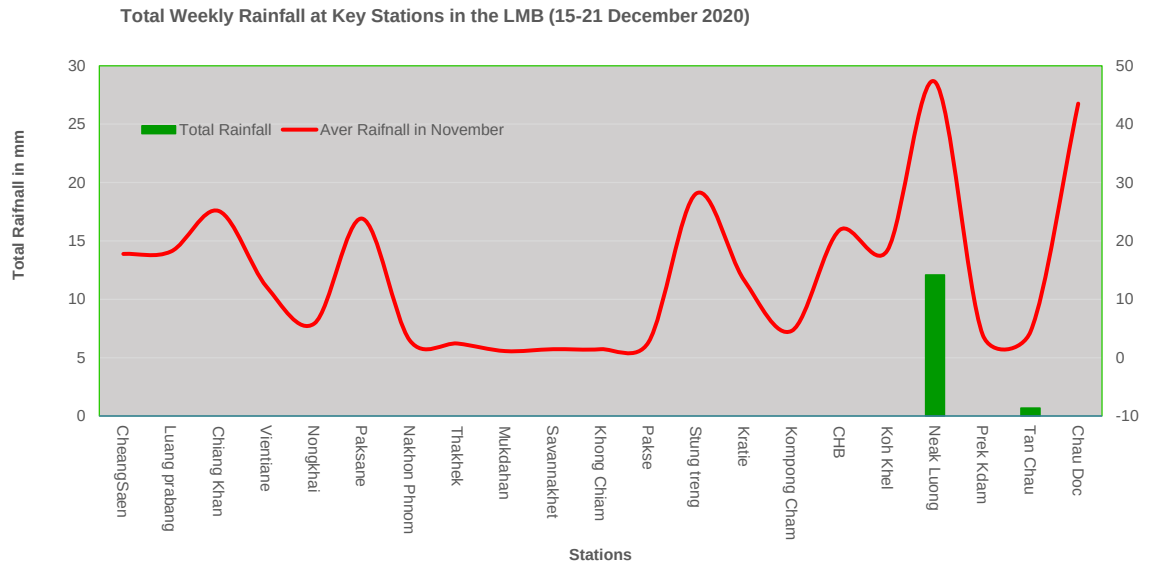


Figure 4: Weekly total rainfall at key stations in the LMB.

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 15–21 December 2020.

The very small amount of rainfall this week indicated the effected area of low pressure. .

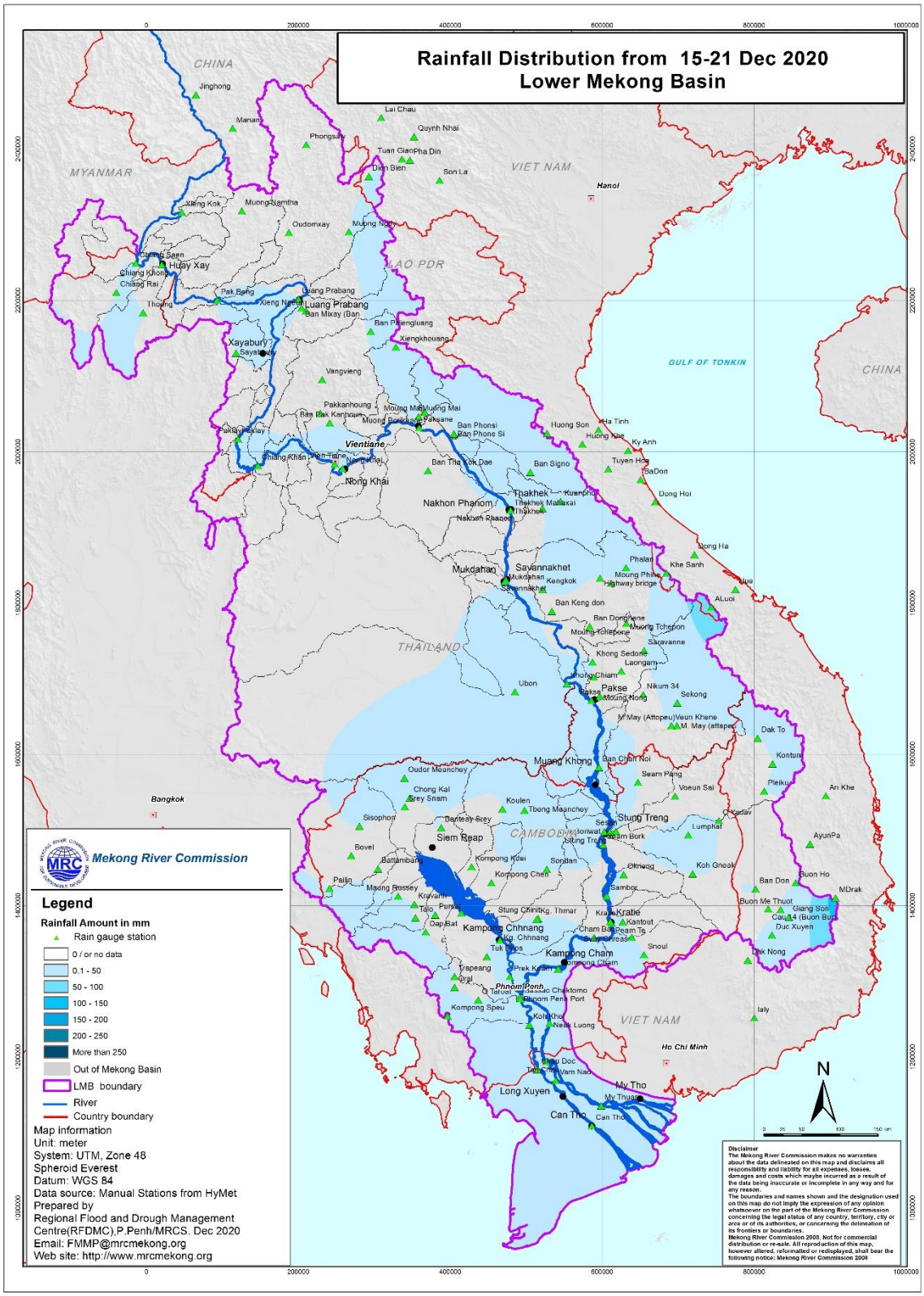


Figure 5: Weekly rainfall distribution over the LMB.

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**.

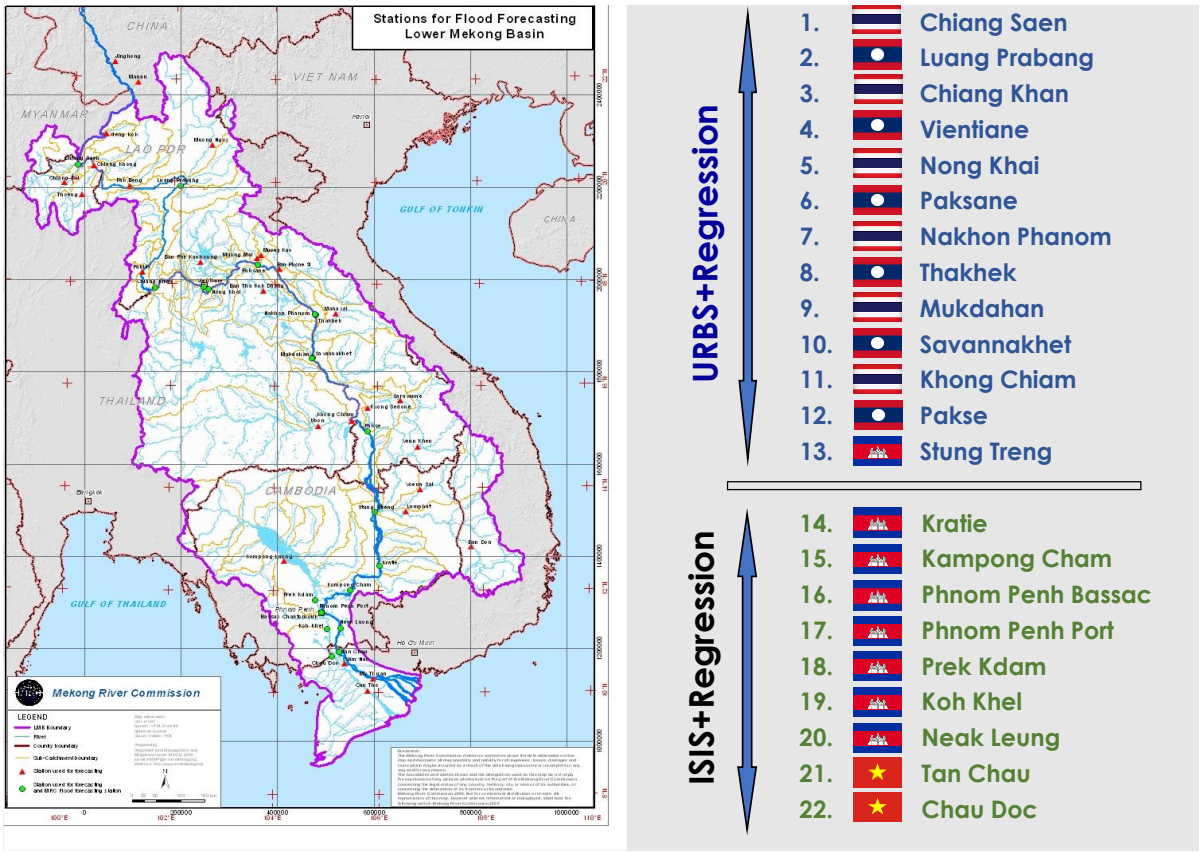


Figure 6: Key stations and model application for River Monitoring and Flood Forecasting.

Chiang Saen and Luang Prabang

Water level during December 15–21 at Thailand's Chiang Saen increased from 2.43 metres to 2.79 metres. This week's water level is 0.45 metres higher than its long-term average (LTA). When comparing to last week, the level this week is relatively higher.

Water level at the Luang Prabang station in Lao PDR increased from 8.97 metres to 9.28 metres, during the reporting period. Compared to last week, the figure shows a slight increase by about 0.44 metres. The level was also 2.73 metres higher than its long-term average (LTA).

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

Water level at Chiang Khan in Thailand increased from 4.88 metres to 5.24 metres during this week, showing 0.09 metres below its LTA value. Downstream water levels from Vientiane to Paksane in Lao PDR slightly increased. The increased values varied between 0.03 metres and 0.21 metres. Compared to this time last year, the current water levels at these stations are about 0.20 metre higher. **However, the water level at Paksane is lower than its historical minimum levels. Water levels at the stations from Vientiane to Paksane are considered critical, as shown in Figure 7** .

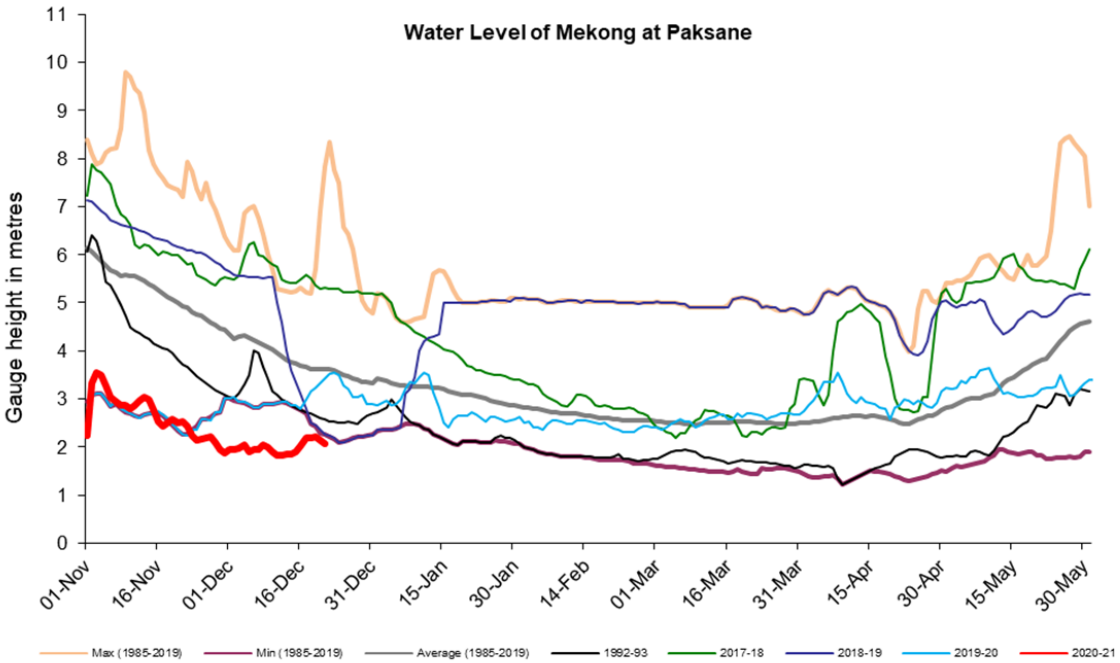


Figure 7: Water levels at Paksane of Lao PDR.

Nakhon Phanom to Pakse

Similarly, water levels from Nakhon Phanom in Thailand to Pakse in Lao PDR slightly increased by about 0.08 metres, during the reporting period. However, water levels from Nakhon Phanom to Mukdahan in Thailand were about 0.30 metres lower than their LTAs, but about 0.50 meters higher than the 2019's level, as shown in Figure 8. **The figures are considered critical.**

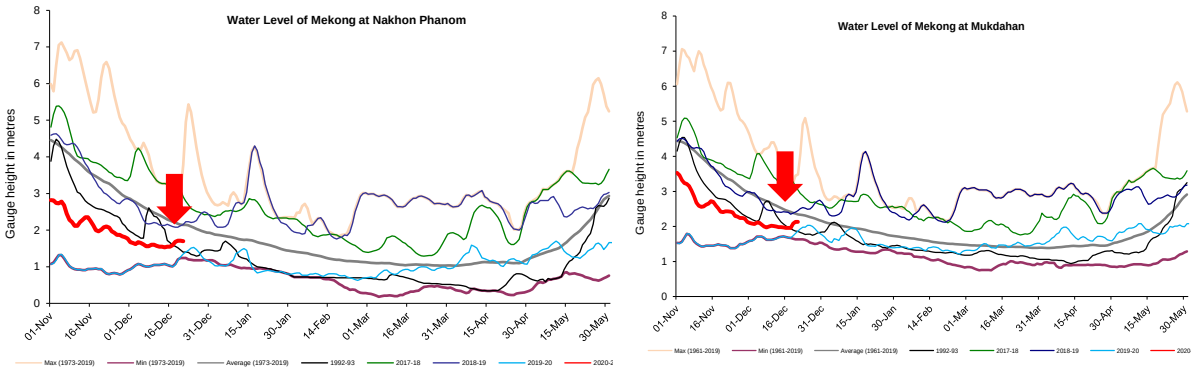


Figure 8: Water levels at Nakhon Phanom and Mukdahan of Thailand.

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

Following the same trend and with the contribution 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 decreased accordingly. This week water levels are lower than their LTAs, as shown in Figure 8.

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 kept decreasing to even lower than their LTAs. They decreased by about 0.25 metres during this reporting week.

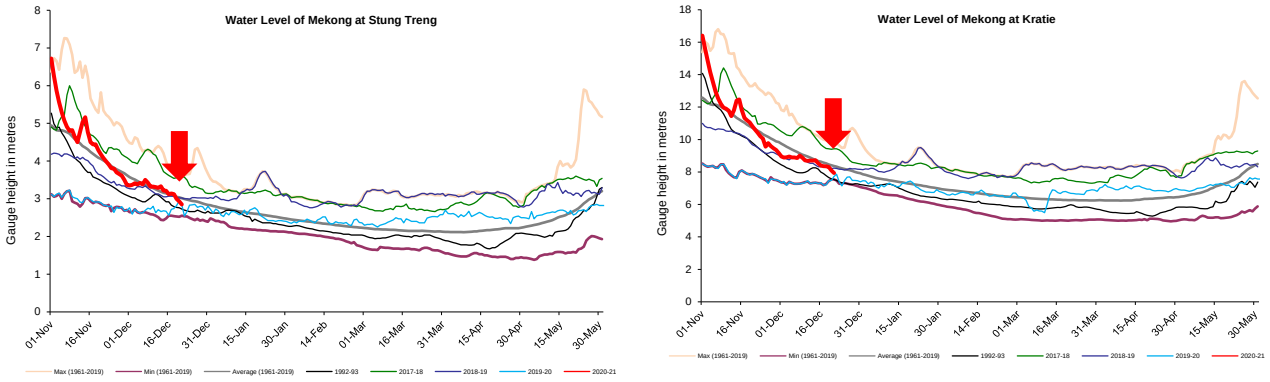


Figure 9: Water levels at Stung Treng and Kratie on the Mekong River.

Tidal stations at Tan Chau and Chau Doc

Like last week, this week from 15 to 21, water levels at the two stations of Viet Nam's Tan Chau and Chau Doc slightly decreased below their LTAs due to daily tidal effects from the sea.

The Tonle Sap Flow

At the end of the dry season, when water levels along the Mekong River increase, flows of the Mekong River reverse into the Tonle Sap Lake (TSL). This phenomenon normally takes place from mid-May to mid-October.

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 December 21 of this reporting period, **it is observed that the main reverse flow into the TSL has started since August 4. There were also two extremely small instances of the reverse flow in July, but they were not significant**. The recorded incident matches the record on reverse flow into TSL by the PMFM's (Procedures for the Maintenance of Flows on the Mainstream) tool on Article 6B (monitoring area). The delay of the reverse flow was due to the low water levels on the Mekong mainstream which were caused by deficit rainfall in upper sub-catchment areas, among other factors. Due to the heavy rain from last month of October in some of the provinces around the Tonle Sap Lake, the inflows to TSL in October and November showed an increase, compared to last year 2019. **It also showed the outflow of the TLS Lake was occurred on 15 November 2020**.

Although the reverse flows have started since August 4, 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 November 30 for the TSL compared with the volumes in 2018 and 2019 and their LTA and the fluctuating levels (1997-2019). It shows that in July, August, October and November (up to December 21) water volumes of the Lake were higher than those of 2019 and close to those of 2018 during the same period. This is clearly evidenced in Table 1, which indicates that the TSL has been affected by inflows 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 originate from the Mekong mainstream. Thus, flow alterations in the mainstream could have direct impacts on the Tonle Sap Lake water levels and on hydrology.

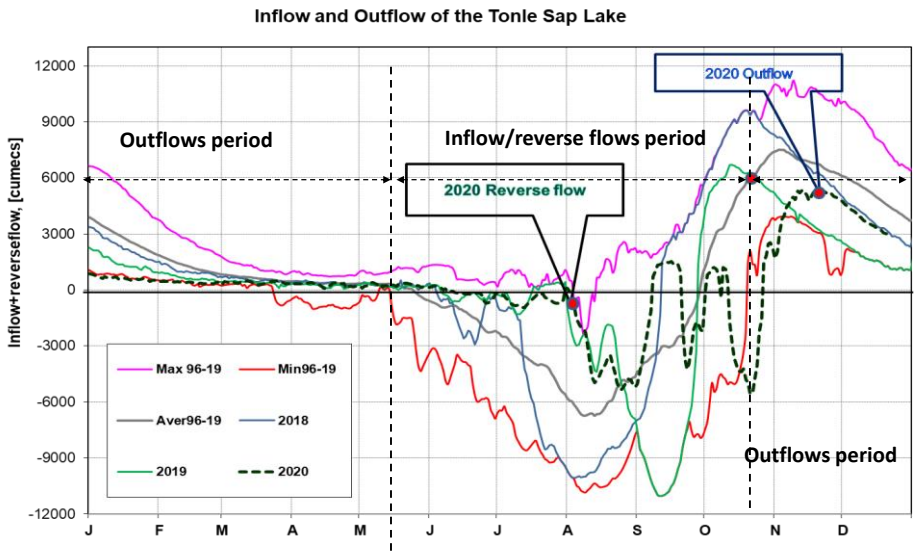


Figure 10: Seasonal change of inflows and outflows of Tonle Sap Lake.

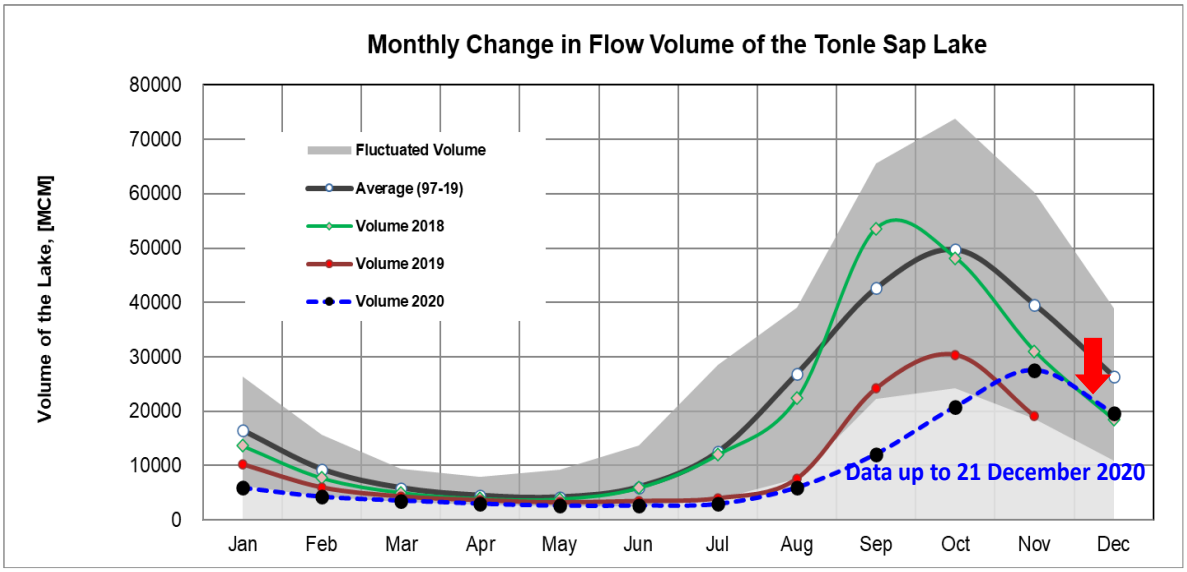


Figure 11: The seasonal change in monthly flow volume of Tonle Sap Lake.

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]	Percentage of Volume in 2020 [%]
Jan	16452.95	26357.53	6272.01	13633.41	10285.31	5906.80	35.90
Feb	9312.36	15596.22	4281.41	7729.72	6019.30	4264.19	45.79
Mar	5868.92	9438.24	3350.92	5037.06	4354.62	3553.99	60.56
Apr	4474.98	8009.14	2875.42	3956.47	3667.47	2992.61	66.87
May	4166.07	9176.93	2417.81	3864.00	3266.43	2594.92	62.29
Jun	6034.10	13635.01	2470.54	5919.18	3517.06	2641.88	43.78
Jul	12502.58	28599.56	3832.51	12024.96	4001.99	2925.86	23.40
Aug	26934.35	39015.12	7554.93	22399.65	7622.71	5941.07	22.06
Sep	42644.05	65632.35	22180.73	53639.54	24194.19	12105.31	28.39
Oct	49698.19	73757.23	24276.79	48193.08	30358.38	20799.13	41.85
Nov	39542.58	60367.33	18576.01	31036.07	19112.65	27546.80	69.66
Dec	26325.13	38888.95	10869.43	18469.21	10577.29	19668.09	74.71
	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

During December 15–21, the LMB was affected by two main weather factors. These include (i) the active high pressure from China which extended its ridge to cover the upper and middle parts of the LMB, 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 December 10 to 16

Drought monitoring data are available from Thursday to Wednesday every week; thus, the reporting period is normally delayed for one week compared to Flood and Flash Flood reports.

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

Drought condition of the LMB from December 10 to 16, as shown in Figure 12, was normal in most parts. Meteorological indicator of SPI shows that the LMB received average rainfall in all parts of the region during the monitoring week. The condition was very much similar to last week (December 3 to 9).

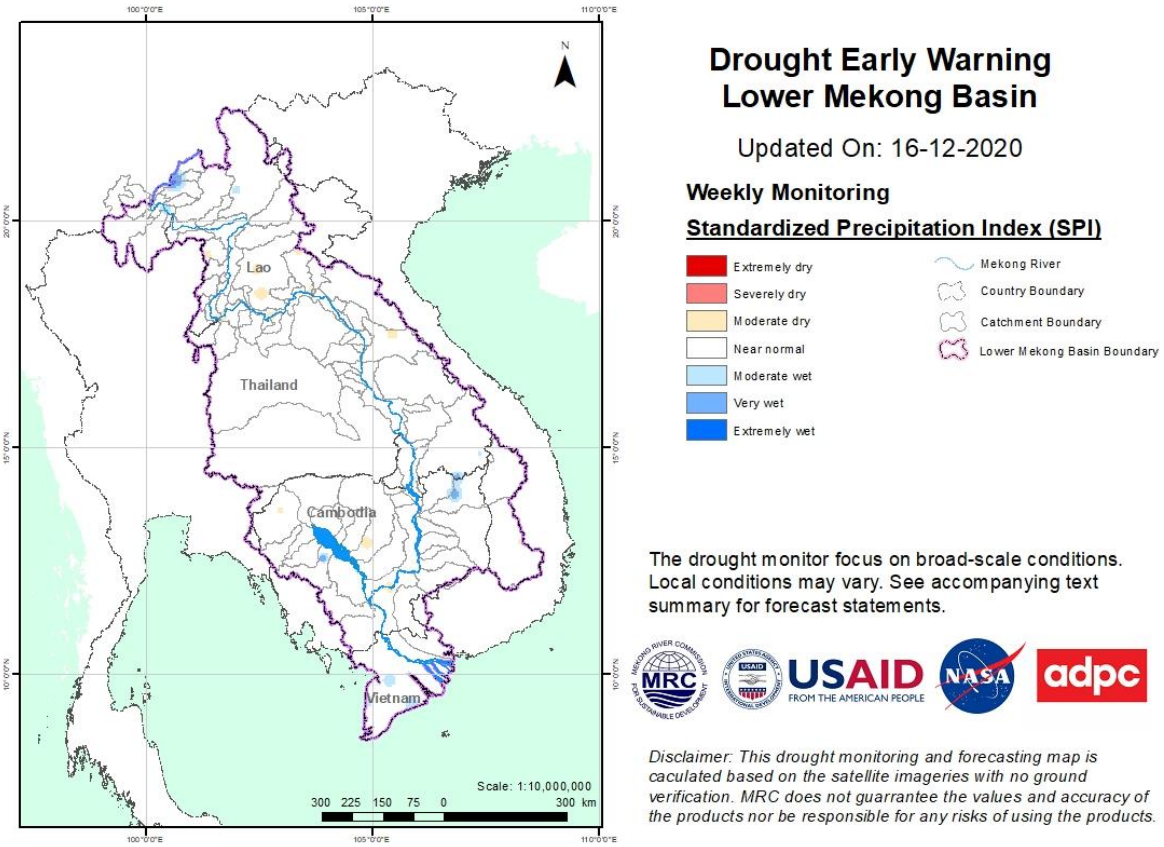


Figure 12: Weekly standardised precipitation index from Dec 10 to 16.

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

Soil moisture condition from December 10 to 16, as displayed in Figure 13, was relatively wet in some ares of the eastern part of the LMB especially in the middle of Lao PDR and the 3S area. However, the condition was still relatively dry in the upper part of the LMB covering Chiang Mai, Chiang Rai, and Payao of Thailand; and Bokeo, Luang Namtha, Xayaburi, Phongsaly, Luang Prabang, Xieng Khouang, and Vientiane of Lao PDR. Other areas were normal during the monitoring week. The condition was very much similar to that of last week (December 3 to 9).

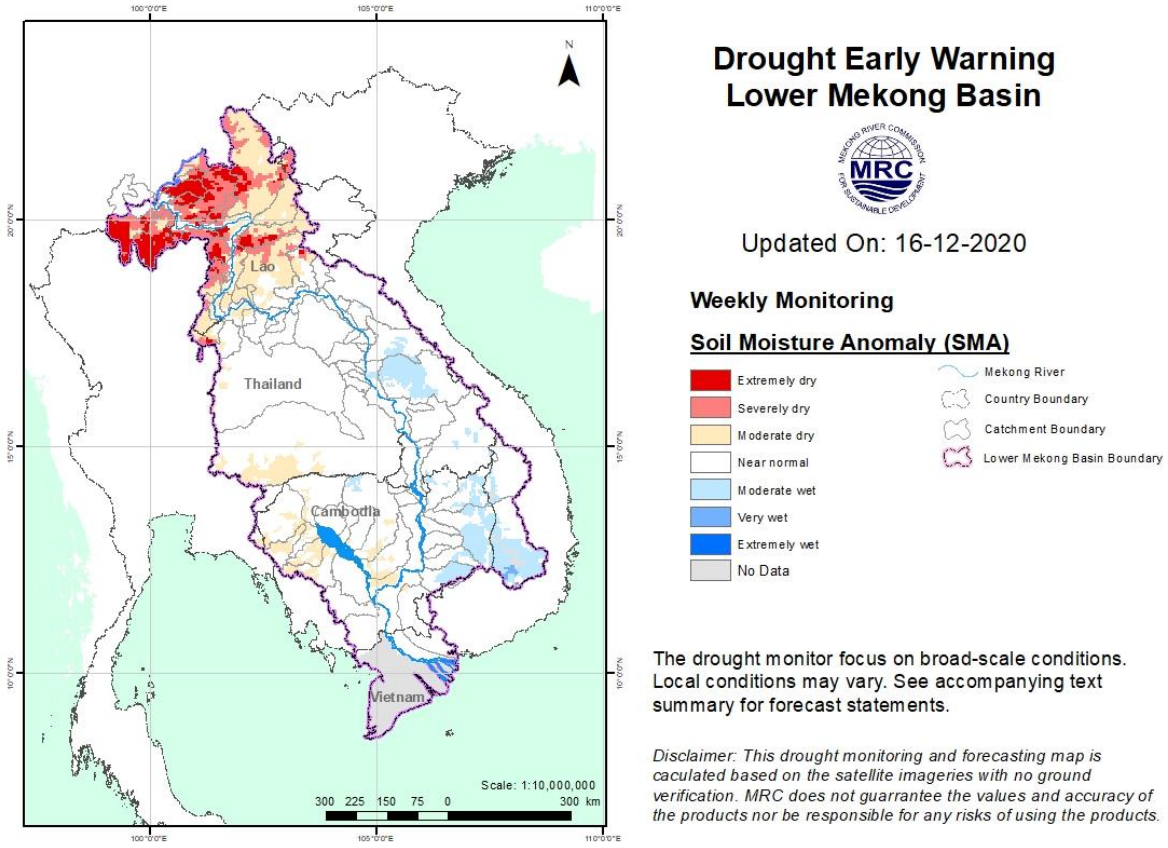


Figure 13: Weekly Soil Moisture Anomaly from Dec 10-16.

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

Even though soil moisture was in severe and extreme dry condition in the northern part of the LMB, the overall drought condition through combined drought index from December 10 to 16, as displayed in Figure 14, shows no significant drought threat over the region. The only moderate dry conditions were found in the northern part of the region which covers small areas of Thailand's Chiang Mai, Chiang Rai, and Phayao, and Lao PDR's Bokeo.

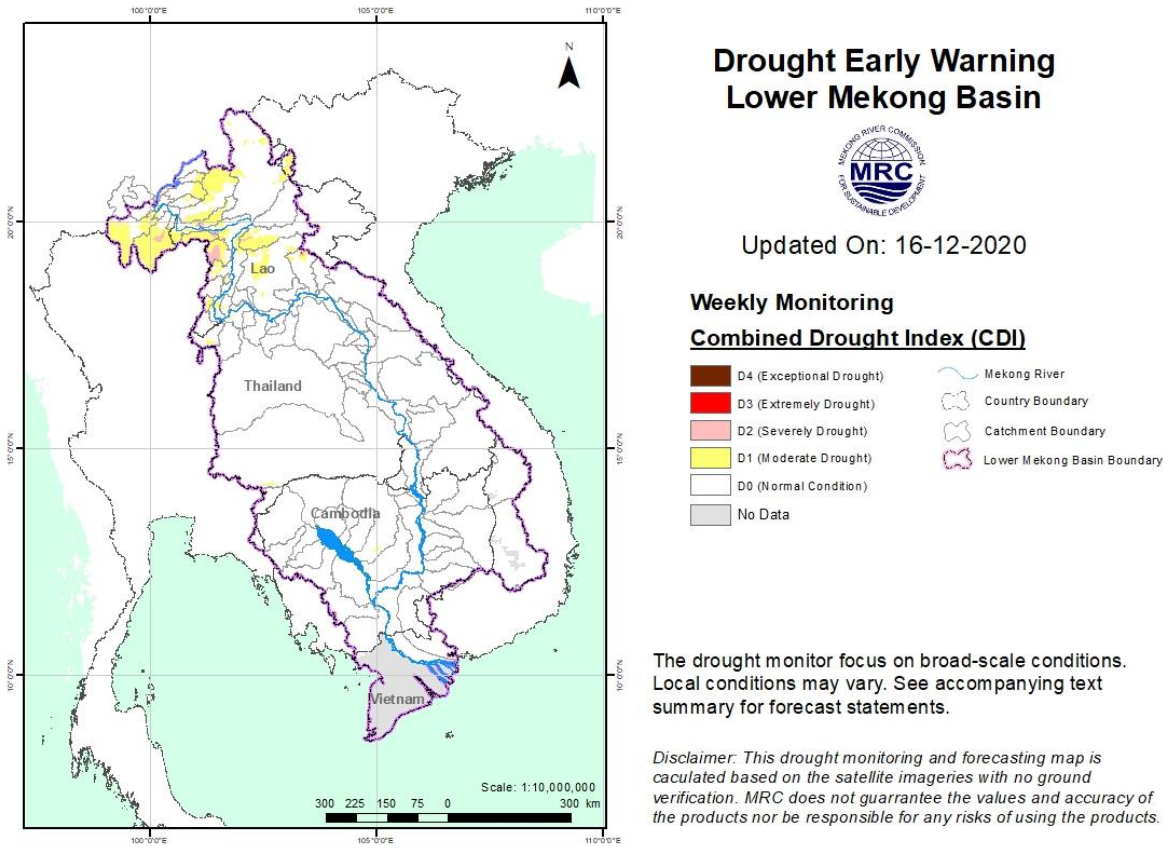


Figure 14: Weekly Combined Drought Index during Dec 10 to 16.

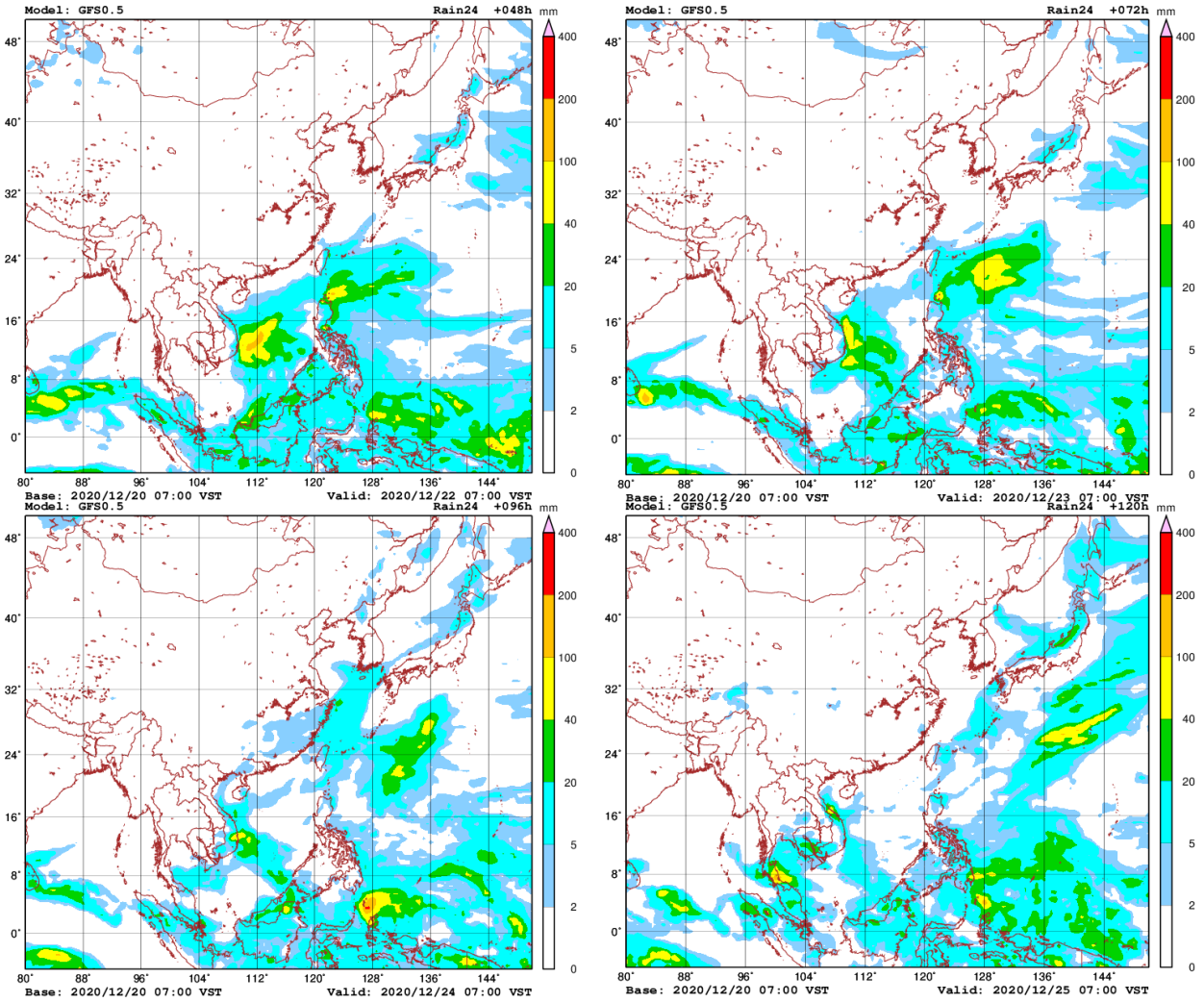
More information on Drought Early Warning and Forecasting as well as the explanation is available here: http://droughtforecast.mrcmekong.org/templates/view/our-product.

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. They include (i) high pressure from China, and (ii) the on-going prevailing Southwest Monsoon from the Gulf of Thailand to the lower part of the LMB. During that period, very small rainfall (2-10 mm/24hrs) may occur in some areas of the LMB.

Figure 15 shows accumulated rainfall forecast (24hrs) of the GFS model from December 22 to 28.



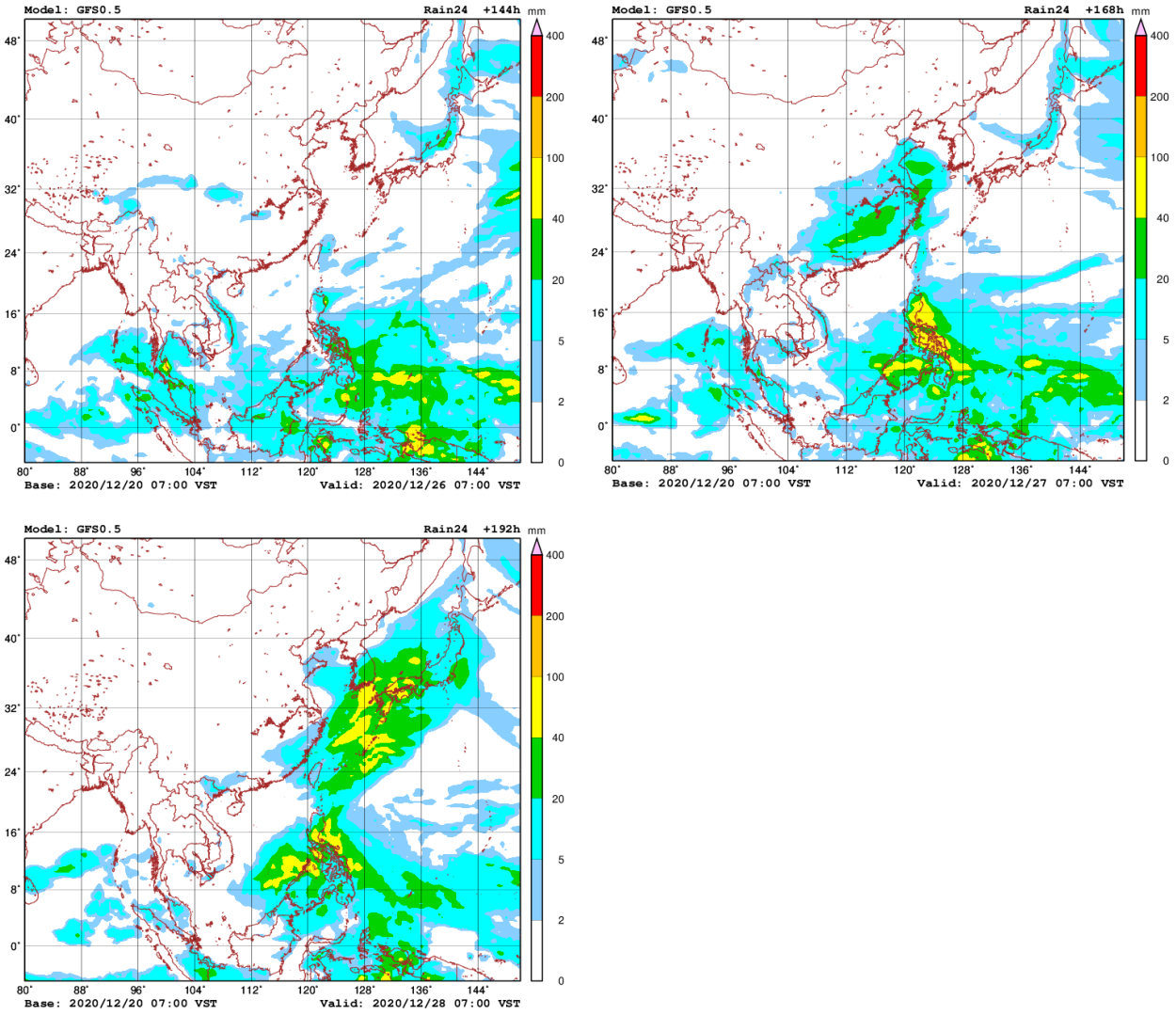


Figure 15: Accumulated rainfall forecast (24 hrs) of model GFS.

6.2 Water level forecast

Chiang Saen and Luang Prabang

Based on December 21's weekly river monitoring bulletin, the weekly forecast water level at Chiang Saen in Thailand is expected to slightly increase from 2.79 metres to 2.85 metres in the next seven days. The trend of water levels at these stations will continue staying above its LTA.

For Luang Prabang in Lao PDR, the water level is likely to increase also from 9.28 metres to 9.70 metres during the same period. The current water levels are higher than their LTAs.

Chiang Khan, Vientiane-Nong Khai and Paksane

Water level at Chiang Khan in Thailand and Vientiane in Lao PDR are forecasted to go up slightly about 0.07 metres. At Paksane in Lao PDR water level will also slightly increase from 2.08 metres to 2.40 metres in the next seven days. No precipitation is forecasted in the area. The water level will remain lower than its LTA and even lower than minimum level for Paksane.

Nakhon Phanom to Pakse

Water levels from Nakhon Phanom in Thailand and Thakhek in Lao PDR may increase slightly by about 0.05 metres in the next seven days. From Khong Chiam in Thailand to Pakse in Lao PDR the water will also decrease by about 0.05 metres.

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 decrease by about 0.15 meters in the next seven days as no rain is forecasted in 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.

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 over their LTAs, following daily tidal effects from the sea.

Table 3 shows the weekly River Monitoring Bulletin issued on December 21. 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 February 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).

Temporarily, the global scale of rainfall prediction is used to see how the rain distribution looks like for the coming months. Figure 16 of the monthly anomaly maps shows daily average of each month in mm/day from December 2020 to February 2021 produced by the NMME.

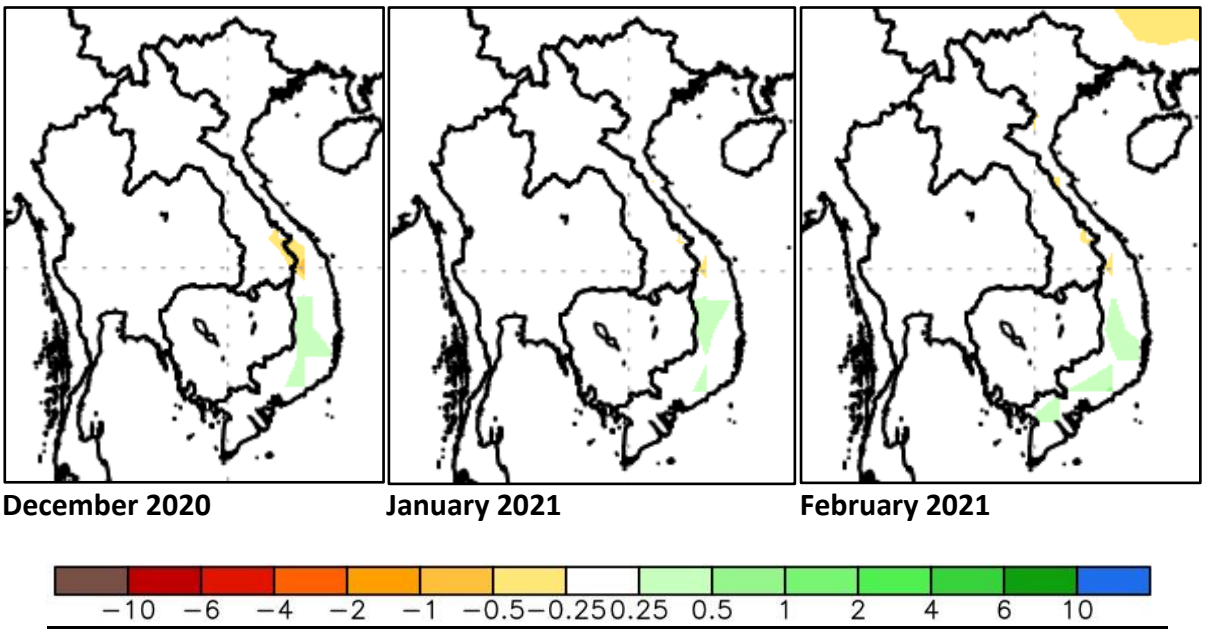


Figure 16: Daily average of monthly rainfall anomaly forecast from Oct to Dec 2020.

Since the dry season has already begun, the LMB is not going to receive any significant rain from this December 2020 to March 2021. The ensemble prediction model forecasts that the LMB is likely to receive very little rain from December this year through February next year mainly in the Central Highland of Viet Nam.

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: 22 December to 28 December 2020

Date: 21 December 2020

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)						
		20-Dec			20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
Jinhong		0.0	-	-	536.53	536.58							
Chiang Saen		0.0	357.110	0.00	2.72	2.79	2.84	2.87	2.90	2.95	2.90	2.85	2.80
Luang Prabang		0.0	267.195	2.53	8.95	9.28	9.51	9.67	9.72	9.78	9.82	9.77	9.70
Chiang Khan		0.0	194.118	1.91	5.17	5.24	5.37	5.48	5.56	5.60	5.63	5.66	5.61
Vientiane		0.0	158.040	-0.28	1.92	2.00	2.05	2.13	2.20	2.25	2.29	2.32	2.35
Nongkhai		0.0	153.648	0.33	1.85	2.02	2.11	2.20	2.28	2.34	2.38	2.42	2.46
Paksane		0.0	142.125	0.10	2.15	2.08	2.15	2.21	2.27	2.32	2.36	2.38	2.41
Nakhon Phanom		0.0	130.961	0.18	1.71	1.70	1.68	1.72	1.76	1.80	1.83	1.85	1.86
Thakhek		0.0	129.629	1.38	3.00	3.01	2.98	3.03	3.08	3.12	3.16	3.19	3.21
Mukdahan		0.0	124.219	0.72	2.13	2.13	2.11	2.09	2.12	2.15	2.17	2.19	2.21
Savannakhet		0.0	125.410	-0.65	1.38	1.37	1.35	1.33	1.34	1.36	1.37	1.38	1.39
Khong Chiam		0.0	89.030	1.02	2.53	2.55	2.52	2.48	2.44	2.47	2.51	2.54	2.57
Pakse		0.0	86.490	0.03	1.40	1.42	1.41	1.39	1.37	1.39	1.42	1.44	1.45
Stung Treng		nr	36.790	0.32	2.93	2.85	2.80	2.75	2.72	2.70	2.71	2.73	2.75
Kratie		nr	-1.080	3.06	8.10	7.94	7.81	7.72	7.65	7.61	7.59	7.61	7.64
Kompong Cham		nr	-0.930	0.65	4.02	3.83	3.65	3.51	3.40	3.32	3.28	3.26	3.29
Phnom Penh (Bassac)		nr	-1.020	1.58	3.33	3.21	3.12	3.04	2.98	2.93	2.91	2.90	2.91
Phnom Penh Port		nr	0.000	0.14	2.35	2.23	2.13	2.05	2.00	1.95	1.92	1.90	1.92
Koh Khel		nr	-1.000	1.52	3.27	3.17	3.10	3.05	3.02	3.00	2.98	2.96	2.97
Neak Luong		nr	-0.330	0.81	2.54	2.58	2.50	2.43	2.35	2.30	2.27	2.25	2.24
Prek Kdam		nr	0.080	0.58	3.02	2.96	2.90	2.85	2.81	2.76	2.72	2.70	2.71
Tan Chau		0.0	0.000	-0.37	1.20	1.10	0.97	0.88	0.93	1.03	1.15	1.26	1.37
Chau Doc		nr	0.000	-0.60	1.28	1.18	1.10	1.00	1.05	1.17	1.29	1.41	1.50

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

Rainfall during this reporting week was concentrated from Cambodia's Neak Luong to Viet Nam's Tan Chau and Chau Doc in the lower parts of the LMB (0.7–12.10 mm). No rainfall in the upper and middle parts of the Mekong region was recorded, during this week report. The highest concentrated rainfall was observed at Cambodia's Neak Luong (up to 12.10 mm). Compared with last week's amount, the rainfall this week was considered much smaller.

Based on the forecasted rainfall from satellite using GFS data, small rainfall is likely to take place in the Mekong region from December 22 to 28. And it is about 0.2-25 mm of forecasted rainfall in the lower part of the LMB.

7.2 Water level and its forecast

Water levels from Thailand's Chiang Khan to Lao PDR's Veintaine were slightly increasing , while from Nakhon Phanom in Thailand to Pakse in Lao PDR during this reporting week were decreasing. At Stung Treng in Cambodia, water levels continued decreasing due to the absence of rainfall and influence of tributary dam operations. Water levels at Kratie, Kompong Cham, Neak Luong, Bassac at Phnom Penh, and Prek Kdam in Cambodia were still lower than their LTA levels. The low level was due to low inflows from upstream and no rainfall in the region from December 15 to 21. Generally, this week's water levels were relatively higher than those of last week at the upper but lower in the middle to the lower parts of the LMB.

The starting date of the reverse flow from the Mekong River into the Tonle Sap Lake took place on August 4, slightly late compared to a normal event. However, two extremely small and brief instances happened in July. Due to heavy rainfall in late October 2020, the water volume of the Lake at this reporting point is higher than 2019 and close to those of 2018. However, it is lower than its LTA which is considered critical a level. It also shows the outflow of the TLS Lake was occurred on 15 November 2020.

Over the next few days, water levels across most monitoring stations in the LMB are expected to continue increasing slightly from Nakhon Phanom to Pakse, ranging between 0.02 and 0.15 metres. Despite this, the situation still continues to put most stations' water levels below their LTAs.

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

7.4 Drought condition and its forecast

Drought condition of the LMB from December 10 to 16 was very much similar to last week (December 3 to 9). The region only showed some little moderate dry soil moisture in the northern part and no meteorological drought in the whole 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 from December this year through February next year mainly in the Central Highland of Viet Nam.

Annex A: Tables for weekly updated water levels and rainfall at the Key Stations

Table A1: Weekly observed water levels

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
15-12-2020	536.56	2.43	8.97	4.88	1.86	1.89	1.91	1.55	1.97	1.66	3.21	8.54	4.44	3.49	3.39	2.74	3.29	1.88	2.04
16-12-2020	536.58	2.48	8.85	4.92	1.90	1.99	2.02	1.55	1.96	1.62	3.12	8.40	4.36	3.46	3.37	2.62	3.24	1.81	1.94
17-12-2020	536.64	2.71	9.04	4.85	1.86	1.94	2.19	1.59	1.96	1.42	3.14	8.36	4.27	3.46	3.38	2.35	3.21	1.67	1.81
18-12-2020	536.62	2.76	9.00	4.72	1.85	1.92	2.19	1.68	1.96	1.40	3.12	8.35	4.21	3.43	3.35	2.53	3.18	1.38	1.55
19-12-2020	536.48	2.70	8.95	4.90	1.88	1.86	2.21	1.71	2.08	1.39	3.00	8.31	4.14	3.39	3.31	2.58	3.08	1.18	1.31
20-12-2020	536.53	2.72	8.95	5.17	1.92	1.85	2.15	1.71	2.13	1.40	2.93	8.10	4.02	3.33	3.27	2.54	3.02	1.20	1.28
21-12-2020	536.58	2.79	9.28	5.24	2.00	2.02	2.08	1.70	2.13	1.42	2.85	7.94	3.83	3.21	3.17	2.58	2.96	1.10	1.18

Table A2: Weekly observed rainfall

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
15-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.6	0	0	0
16-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0.7	0
17-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21-12-2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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