



Twenty Fourth Session of the ASEAN Climate Outlook Forum (ASEANCOF-24)

22 – 25 April 2025, MOWRAM Cambodia



Consensus Bulletin for June-July-August (JJA) 2025 Season

INTRODUCTION

The ASEAN Climate Outlook Forum (ASEANCOF) is an avenue to collaboratively develop consensus-based seasonal climate outlooks and related information on a regional scale. The forum's outlook and its activities contribute significantly to one of the key roles of the ASEAN Specialised Meteorological Centre (ASMC), which is to conduct climate and seasonal prediction for the Association of Southeast Asian Nations (ASEAN) region through pooling the expertise of ASEAN National Meteorological and Hydrological Services (NMHSs). In 2021, the ASEANCOF Working Group was established with the goal to guide and support the long-term development of ASEANCOF, in particular with regard to the implementation of objective outlooks.

The Twenty-Fourth session of ASEANCOF (ASEANCOF-24) was organised by the Ministry of Water Resources and Meteorology, Cambodia (MOWRAM), RIMES, ASMC, the ASEANCOF Working Group, and WMO. A two-day training workshop occurred prior to the COF proper, with training by the UK Met Office, ASMC, and University of Southern Queensland (22 – 23 April).

During the COF proper, participants from the NMHSs of ASEAN Member States created a consensus forecast for the boreal summer monsoon 2025 in the ASEAN region. The consensus for the June-July-August (JJA) 2025 outlook was achieved through a hybrid session, which included presentations from NMHSs, questionnaires, and discussions regarding the current climate conditions and predictions for Southeast Asia. The theme of ASEANCOF-24 was Climate Services and Heat Health. On the last day of ASEANCOF-24, a sharing session was held by the Global Heat Health Information Network (GHHIN) Southeast Asia Hub, followed by a general sharing session by various sector representatives and producers, including UN ESCAP, FAO, and agricultural and health representatives from Lao PDR and Cambodia. A recording of the COF proper is available at <https://community.wmo.int/en/meetings/24th-association-southeast-asian-nations-asean-climate-outlook-forum-aseancof-24>.

CONDITIONS AND OUTLOOK

Recent analysis of sea surface temperature (SST) anomalies over the equatorial Pacific shows average to slightly below-average SSTs across the equatorial Pacific Ocean, and along with atmospheric indicators such as trade wind

strength and cloudiness, indicate ENSO-neutral conditions. In the Indian Ocean, the Indian Ocean Dipole (IOD) is neutral.

The international climate outlook predicts that ENSO-neutral conditions will continue into JJA 2025. After JJA 2025, most models predict ENSO-neutral conditions, although there is still a high amount of uncertainty for ENSO predictions issued in April.

The Indian Ocean Dipole (IOD) is also predicted to be neutral during JJA 2025.

The onset of the Southwest monsoon season is predicted to be near average for most of Southeast Asia in 2025, starting from May. The strength of the Southwest monsoon is predicted to be near-average over most of Southeast Asia, based on model predictions.

During JJA 2025, tropical cyclone frequency is predicted to be near average around the Philippine Sea and the South China Sea and above average over the Bay of Bengal.

RAINFALL

For the upcoming boreal (Northern Hemisphere) summer season (JJA 2025):

Above-normal rainfall is predicted over parts of the southern ASEAN region. Near- to above-normal rainfall is predicted over eastern and southern Philippines, parts of east Malaysia, Brunei Darussalam, northeastern Cambodia, and northern and southern Lao PDR.

Below- to near-normal rainfall is predicted over parts of southern Thailand, northwestern Cambodia, coastal central Vietnam and northwestern Philippines.

Elsewhere, near-normal rainfall is predicted.

TEMPERATURE

For the upcoming boreal (Northern Hemisphere) summer season (JJA 2025):

Above-normal temperature is predicted over much of the equatorial region, as well as over eastern and southern Philippines and parts of northern Viet Nam and northwestern Cambodia.

Elsewhere, near- to above-normal¹ temperature is predicted,

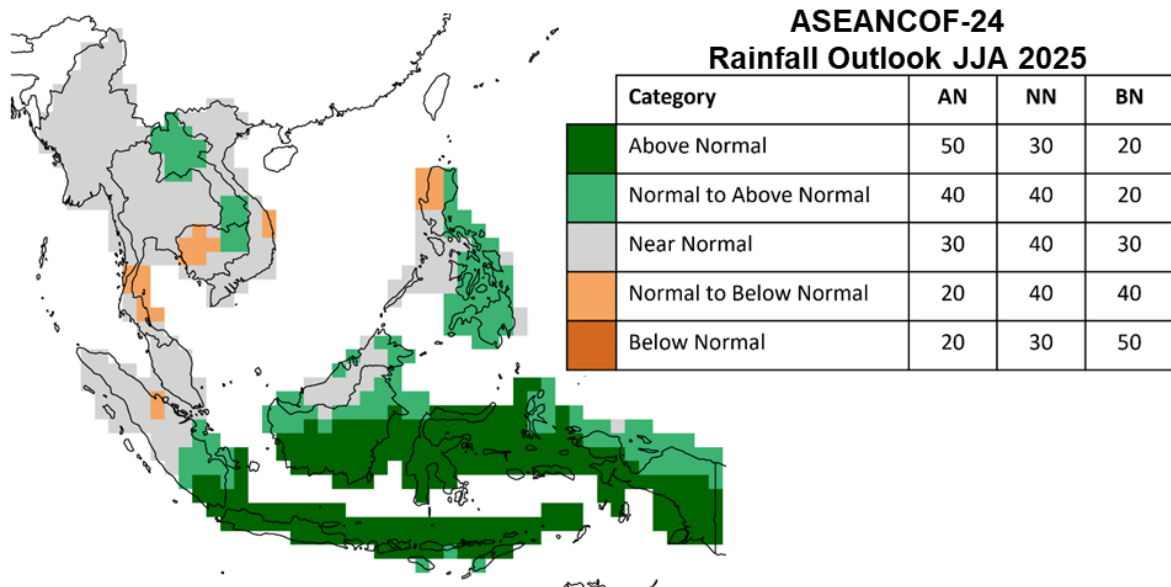
Refer to **Annex A** for reference on what is meant by “above, near, or below normal” in the outlook. For more information on the boreal (Northern Hemisphere) summer monsoon outlook and further updates on the national scale, the relevant NMHSs should be consulted (see **Annex D**).

¹ For this outlook, near-to above-normal temperature corresponds to 50% probability of above-normal temperature, 40% near-normal, and 10% below-normal. Further information is in the consensus maps.

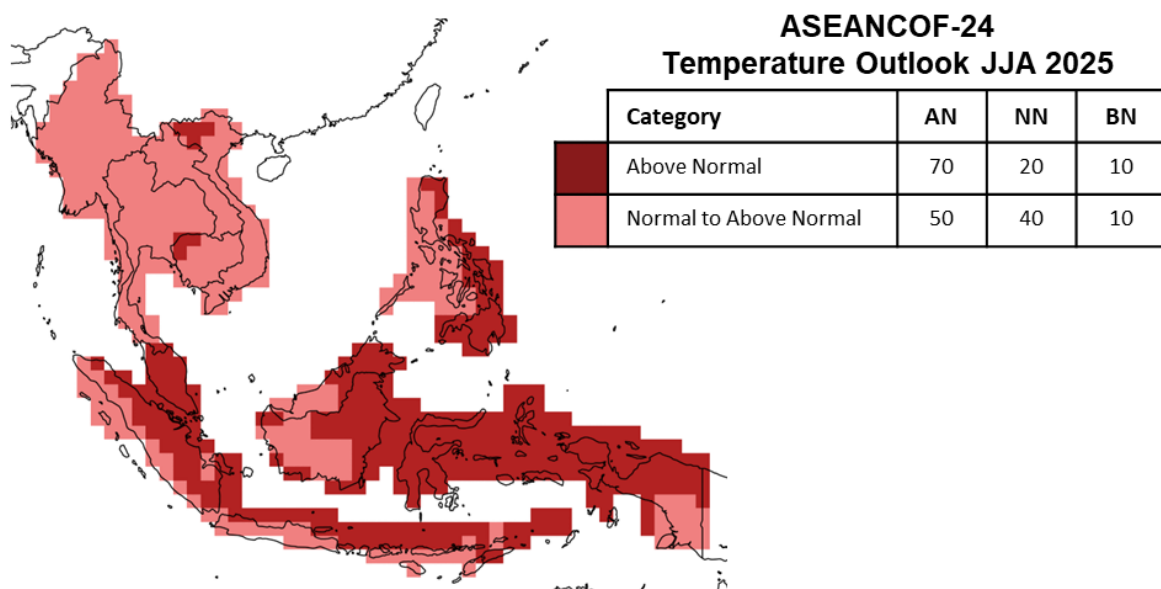
CONSENSUS MAPS FOR JJA 2025

The following maps provide the probabilistic outlooks for JJA 2025 season in terms of tercile categories of “Above Normal” (AN: upper tercile), “Near Normal (NN: middle tercile) and “Below Normal” (BN: lower tercile).

PROBABILISTIC RAINFALL OUTLOOK



PROBABILISTIC TEMPERATURE OUTLOOK



ACKNOWLEDGEMENTS

ASEANCOF would like to convey its appreciation to the NMHSs of the ASEAN Member States for sharing their national level forecasts, the Global Producing Centres, the Southeast Asia Regional Climate Centre – Network, RIMES, UN ESCAP, FAO, USQ, GHHIN Southeast Asia Hub and other partners of ASEANCOF for sharing their products and expertise, and the World Meteorological Organization Regional Office in Asia and the Southwest Pacific (WMO-RAP) for their continued support of ASEANCOF. The Forum would also like to thank MOWRAM Cambodia for hosting the forum, with support from RIMES, CREWS and WISER Asia Pacific for the funding support provided for the meeting.



In-person participants of ASEANCOF-24. ASEANCOF-24 was opened by H.E. Mr Thor Chetha, Minister of the Ministry of Water Resources and Meteorology.

Annex A: Rainfall and Temperature Tercile Climatologies

ANNEX A: RAINFALL AND TEMPERATURE TERCILE CLIMATOLOGIES

The following figures include mean rainfall and temperature and tercile boundary climatologies to reference against the consensus outlook. Only a single source of data for each variable is provided: for rainfall CHIRPS (Funk et al. 2014) and for temperature ERA5 (Hersbach et al. 2019). For more representative climatologies, reference should be made also against observational datasets known to better characterize local patterns (e.g. quality-controlled station data from the respective NMHSs).

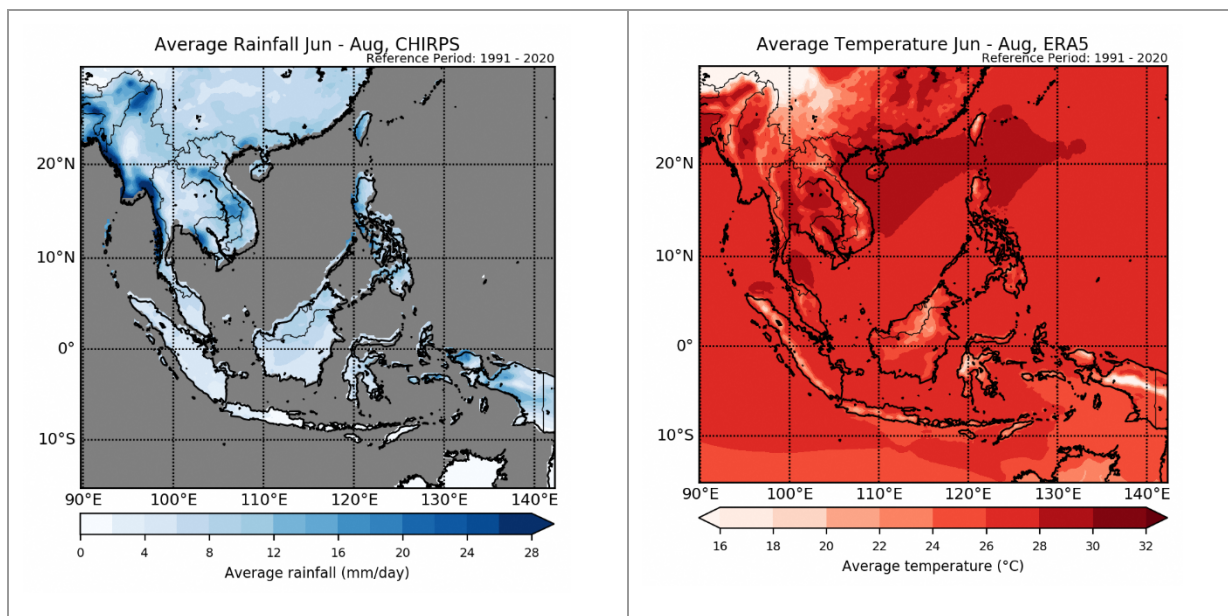


Figure A1: Mean rainfall (left, CHIRPS) and mean temperature (right, ERA5) for JJA for the climatology period 1991-2020.

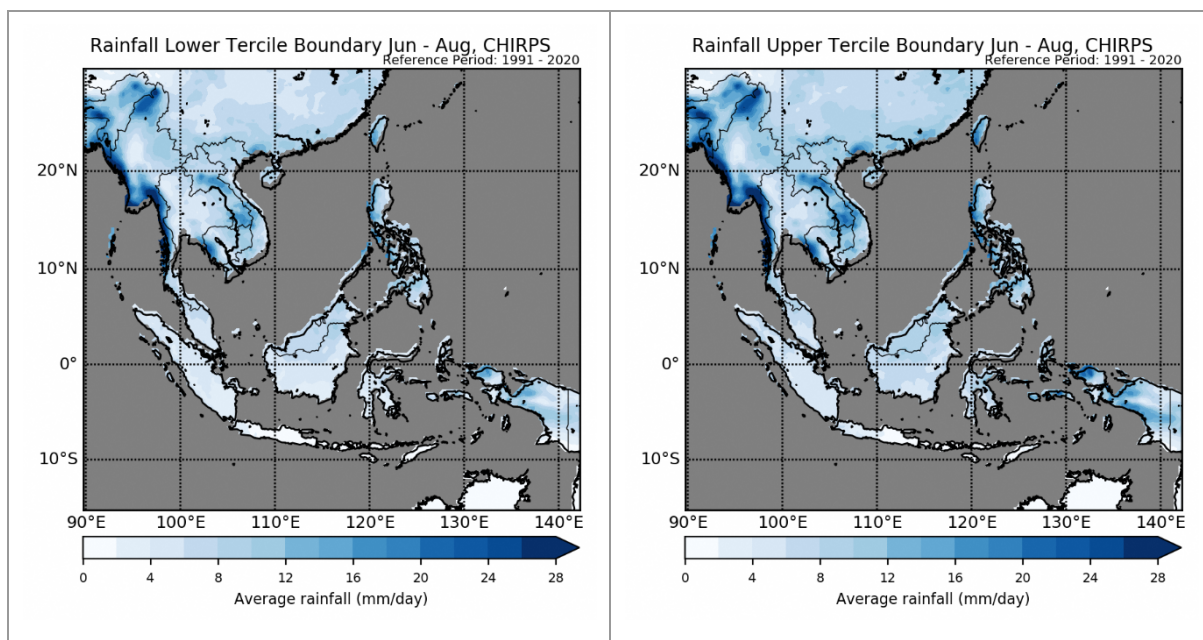


Figure A2: Rainfall climatologies of the lower tercile boundary (left) and the upper tercile boundary (right) for JJA from 1991-2020 using CHIRPS.

Annex A: Rainfall and Temperature Tercile Climatologies

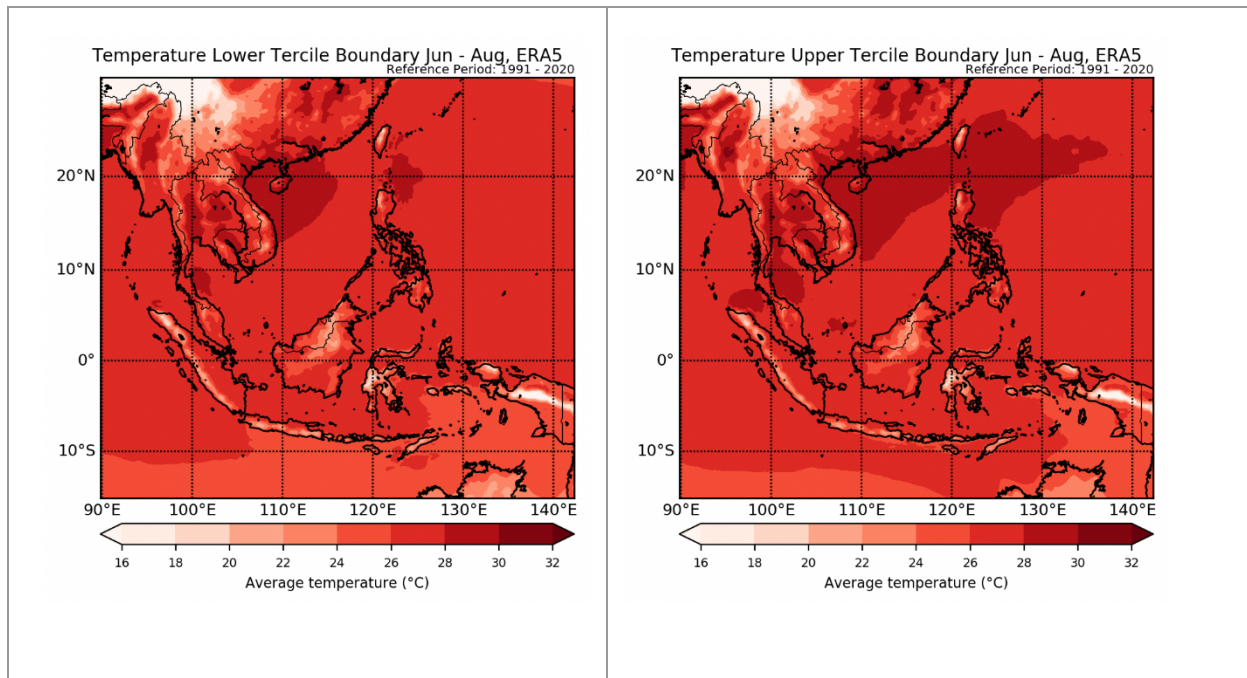


Figure A3: Temperature climatologies of the lower tercile boundary (left) and the upper tercile boundary (right) for JJA from 1991-2020 from ERA5.

ANNEX B: RAINFALL AND TEMPERATURE OUTLOOK FROM MODELS

The following figures show the starting point from the consensus discussion. From this point, NMHS representatives proposed changes, based on the typical impact based on ENSO and IOD state, additional models (including statistical post-processed models), and assessment of model skill.

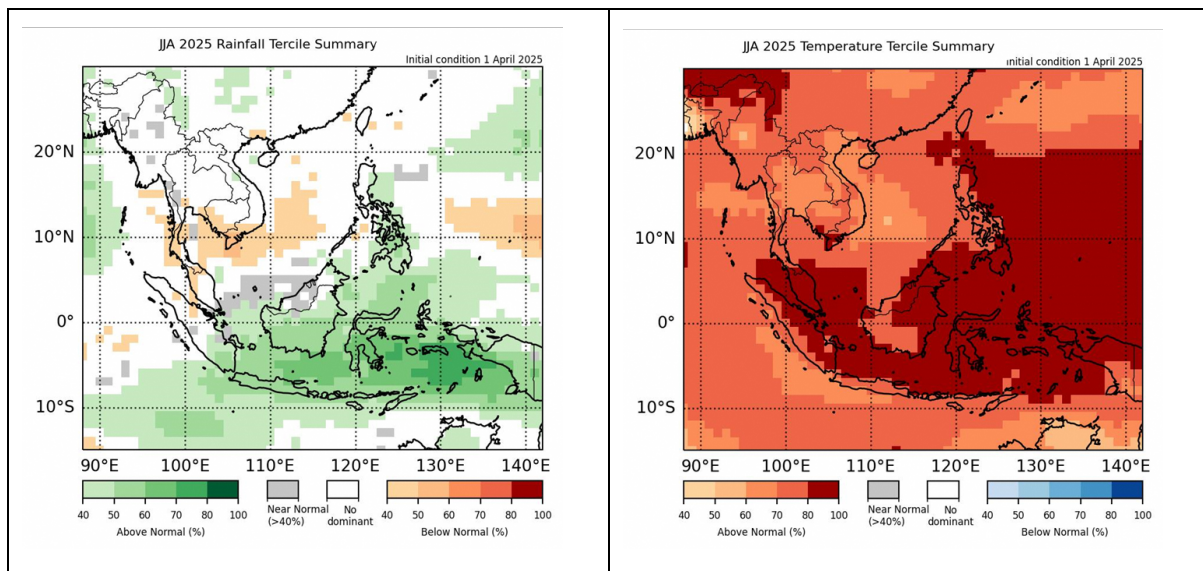
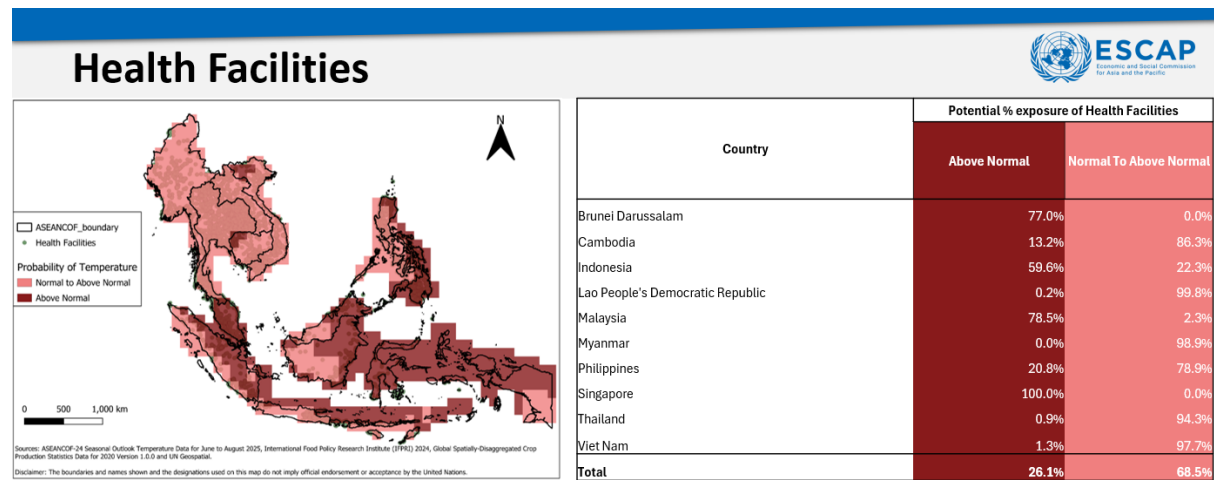


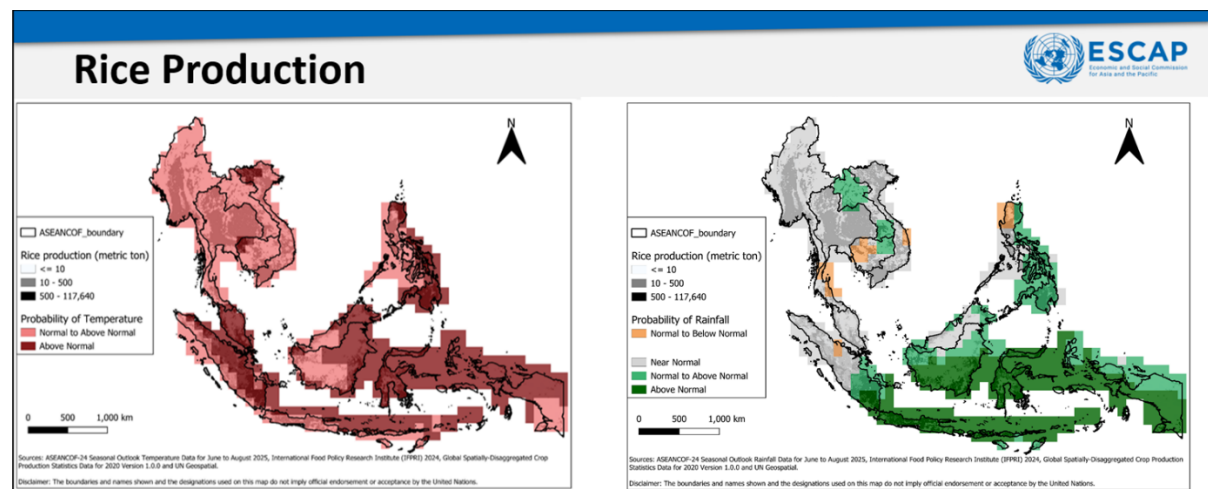
Figure B1: Outlook from the C3S seasonal models for JJA 2025 for rainfall (left) and temperature (right). The models used included NCEP, ECMWF, JMA, UK Met Office, DWD, CMCC, ECCO and MeteoFrance.

ANNEX C: SECTOR OUTLOOK FROM UN ESCAP

In line with the theme of ASEANCOF-24: Climate Services and Heat Health, potential impact to health facilities and rice crop by UN ESCAP based on the ASEANCOF-24 rainfall/temperature consensus outlook is included.



Most health facilities across Southeast Asia are located in areas with a high probability (50–70%) of above-normal temperatures (above), meaning that a large proportion of hospitals and clinics-both in urban and rural regions-will be exposed to significant heat anomalies during the forecast period. This widespread exposure increases the risk of heat-related health impacts for both patients and healthcare workers and may strain the capacity of health systems already facing challenges from rapid urbanization, ageing populations.



For rice crop (above), analysis was done for potential exposure to drought from below normal levels of rainfall (above left) and above-normal temperatures (above right). For most of the rice crop in SEA during this period will be in planting season and rice requires high quantities of water (<https://eos.com/blog/how-to-grow-rice/>). Growing rice in water offers best conditions for producing high yields and therefore potential drought at the planting stage may have severe implications for rice production in SEA. Countries that have an increased chance of below-normal rainfall in JJA 2025 include Cambodia (34% potential exposure of rice production), and the Philippines (24% potential exposure). Heat stress can also affect rice yield, and most of the rice production has a potential exposure to above-normal temperatures (50 – 70% chance) in the upcoming season.

Annex D: National Meteorological Services' Contact Information

ANNEX D: NATIONAL METEOROLOGICAL SERVICES' CONTACT INFORMATION

- Brunei Darussalam Meteorological Department (BDMD)

<http://www.met.gov.bn/>

- Department of Meteorology, Cambodia

<http://www.cambodiameteo.com/>

- Badan Meteorologi, Klimatologi dan Geofisika, Indonesia (BMKG)

<http://www.bmkg.go.id>

- Department of Meteorology and Hydrology (DMH), Lao PDR

<http://dmh.monre.gov.la/>

- Malaysian Meteorological Department (MMD)

<https://www.met.gov.my/en/>

- Department of Meteorology and Hydrology (DMH), Myanmar

<https://www.moezala.gov.mm/>

**- Philippines Atmospheric, Geophysical and Astronomical Services Administration
(PAGASA)**

<http://bagong.pagasa.dost.gov.ph/>

- Meteorological Service Singapore (MSS)

<https://www.weather.gov.sg/home/>

- Thai Meteorological Department (TMD)

<http://www.tmd.go.th/en/>

- National Center for Hydro-Meteorological Forecasting (NCHMF), Vietnam

<https://nchmf.gov.vn/KttvsiteE/en-US/2/index.html>

Annex E: Review of DJF 2024/2025 Consensus Outlook

ANNEX E: REVIEW OF DJF 2024/2025 CONSENSUS OUTLOOK

SUMMARY

The rainfall and temperature were representative of the actual conditions over much of Southeast Asia in December-January-February (DJF) 2024/2025. The Maritime Continent experienced predominantly above-normal rainfall and above-normal temperature, while Mainland Southeast Asia experienced a mix of below- to above-normal rainfall, and near-normal and below-normal temperature apart from above-normal temperature over western Mainland Southeast Asia.

In November 2024, La Niña-like conditions were present as well as signs of a negative Indian Ocean Dipole. The international climate outlooks predicted a weak La Niña was likely to develop sometime in December and persist until February 2025. There was a chance that a short-lived negative Indian Ocean Dipole (IOD) may be present during December 2024 based on the model predictions. However, the IOD was predicted to be neutral during January – February 2025.

Based on the assessment as part of ASEANCOF-24, [SEA RCC Climate Monitoring Node](#), [ASMC](#), and the [WMO El Niño/La Niña Updates](#), during DJF 2024/2025 period La Niña conditions were present, with a short-lived negative IOD in the Indian Ocean in December.

In the sections below, a combination of global gridded data and reviews by National Meteorological and Hydrological Services (NMHSs) was used to verify the outlook.

DJF 2024/2025 RAINFALL OUTLOOK

Over the Maritime Continent, near- to above-normal or above-normal rainfall is predicted for much of the region, including the Philippines, Brunei Darussalam, and Singapore. The exception is over parts of the equatorial region, where a mix of near-normal and normal- to below-normal rainfall is predicted.

Across Mainland Southeast Asia, near- to above-normal or above-normal rainfall is predicted for much of the southern part, including southern Myanmar, southern Thailand, Cambodia, southern Lao PDR, and southern Viet Nam. Below-normal rainfall is predicted for northern Viet Nam and elsewhere, near-normal rainfall is predicted.

There is some agreement between the predicted and observed rainfall for the region in Figure E1.

Over the Maritime Continent, above-normal rainfall was recorded over much of the region, in line with the outlook as well as typical response during La Niña. Parts of the western Maritime Continent recorded near-normal rainfall, a region which typically sees little response from La Niña at this time of the year.

Over Mainland Southeast Asia, a mix of below- to above-normal rainfall was recorded, broadly in line with the predicted mix of below-, near-, and above-normal rainfall, although the predicted region of below-normal rainfall was smaller than what was observed. As this is the dry season for much of Mainland Southeast Asia, the difference between below- and above-normal rainfall is smaller than for the Maritime Continent.

Based on the country reviews by NMHSs (Table D1), there was reasonable agreement between the outlook values averaged over the country and the observed values, with some exceptions (Table E1, in bold). There were some differences between the country reviews (based on rain gauge data) and the CHIRPS gridded product in Figure D1. Cambodia and southern Lao PDR observed near- to above-normal rainfall based on the national level assessments,

Annex E: Review of DJF 2024/2025 Consensus Outlook

whereas rainfall was below-normal based on the CHIRPS dataset. Over Peninsular Malaysia and Singapore, rainfall was above-normal based on the national assessment, while rainfall was near-normal based on CHIRPS.

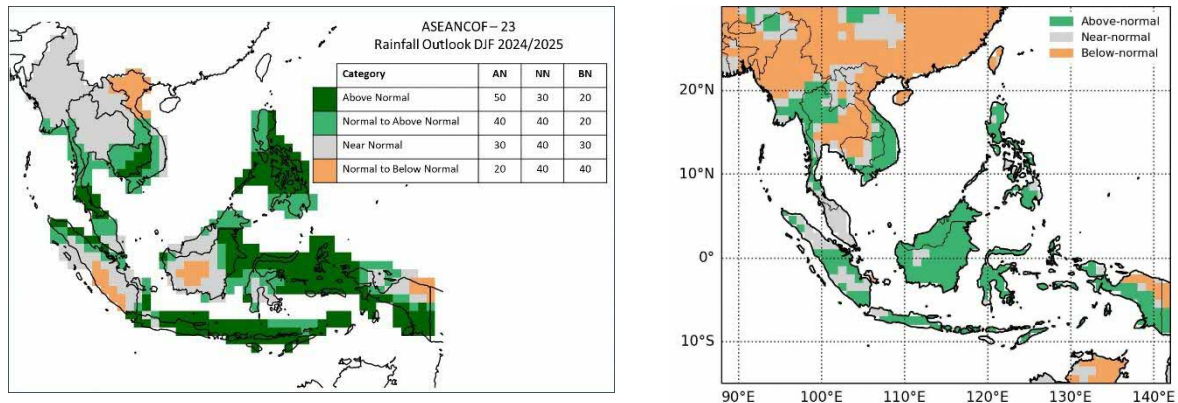


Figure E1: DJF 2024/2025 ASEANCOF outlook (left) observed DJF rainfall in terciles (right, climatology 1991-2020). The rainfall dataset is CHIRPS (Funk et al 2014).

Table E1: Observed Rainfall based on the national level assessment. The Most Likely Category from the ASEANCOF-23 outlook (MLC), the observed rainfall as noted by the NMHS (obs. tercile) are included. The tercile categories are above-normal (AN), near-normal (NN), and below-normal (BN). Bold texts highlights discrepancies between the outlook and observed.

Country	Outlook (MLC*)	NMHS OBS TERCILE
Brunei	NN – AN	AN
Cambodia	Southeastern: AN Rest: NN – AN	AN
Lao PDR	Southern: NN - AN Rest: NN	NN – AN
Malaysia	Northern Peninsular Malaysia, eastern East Malaysia: NN – AN Rest: NN	Peninsular Malaysia: AN East Malaysia: AN
Myanmar	Southern: NN - AN Rest: NN	Eastern: NN Rest: BN Southern: AN
Philippines	Northeastern, central: AN Rest: NN - AN	Mostly NN-AN
Singapore	NN-AN	AN
Thailand	Southern: NN - AN Rest: NN	Southwestern: NN Southeastern: AN Northern, northeastern: BN
Viet Nam	Northern: BN – NN Central eastern coast: NN Rest: NN – AN	Northern: BN Central and Southeastern: NN-AN

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DJF 2023/2024 TEMPERATURE OUTLOOK

Near- to above-normal or above-normal temperature is predicted over most of the ASEAN region. The exception is over northern Lao PDR, and northeast and central Viet Nam, where near-normal temperature is predicted. The highest chance of above-normal temperature is over northern and central Myanmar, northern Thailand, southern Lao PDR, Singapore, the southern Philippines, and Brunei Darussalam.

Most of the Maritime Continent experienced above-normal temperature along with the western Mainland Southeast Asia, while central and eastern Mainland Southeast Asia experience a mix of below- and near-normal temperature, based on the CPC Unified Gauge dataset (Figure E2). While an increase in chance of below-normal temperature was not predicted for parts of Mainland Southeast Asia, the chance of above normal temperature was lower compared to much of the Maritime Continent.

The results from NMHS country reviews (Table E2) also show predominantly above-normal temperatures. There is good agreement between the outlook values averaged over the country and the observed values.

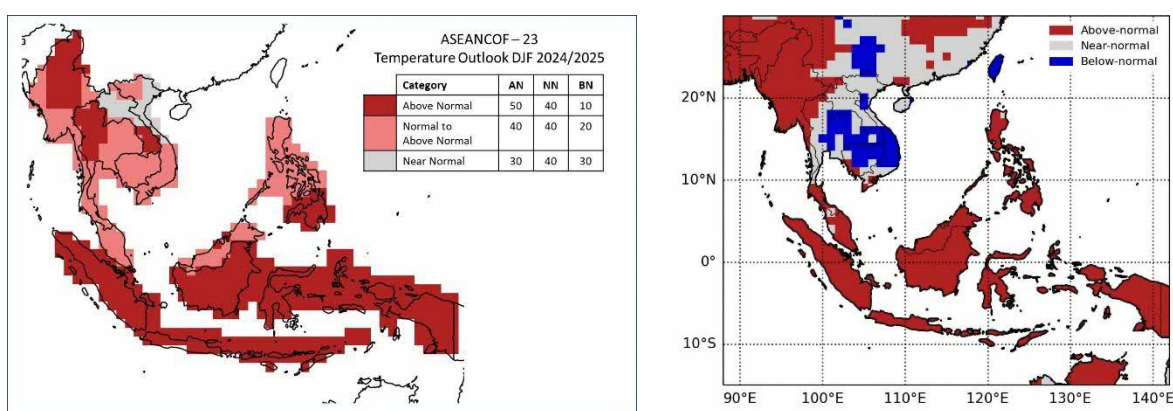


Figure E2: DJF 2024/2025 ASEANCOF outlook (left) observed temperature in terciles (right, climatology 1991-2020). The temperature dataset is from ERA-5.

Table E2: Observed temperature based on the national level assessment. The Most Likely Category from the ASEANCOF-23 outlook (MLC), the observed temperature as noted by the NMHS (obs. tercile) are included. The tercile categories are above normal (AN), near normal (NN), and below normal (BN). Bold texts highlights discrepancies between the outlook and observed.

Country	Outlook (MLC*)	NMHS Observed Tercile
Brunei	AN	AN
Cambodia	NN-AN	NN - AN
Lao PDR	Northern: NN Rest: AN	NN - AN
Malaysia	NN-AN	AN
Myanmar	Northern: AN, Rest: NN-AN	AN
Philippines	Southern: AN, Rest: NN - AN	NN - AN
Singapore	AN	AN
Thailand	Western: AN Rest: NN-AN	Northern, Southwest: AN Northeast: BN , Rest: NN
Viet Nam	Southern and northwestern: NN - AN, Rest: NN	Rest: NN Central: BN , Northwestern: AN

Annex E: Review of DJF 2024/2025 Consensus Outlook

SIGNIFICANT EVENTS

There were several notable low pressure and rainfall-related events throughout the ASEAN region between December 2024 to February 2025. The Philippines saw heavy rainfall from shear lines and thunderstorms, triggering floods, landslides, and evacuations. Brunei and Malaysia recorded above-normal rainfall, leading to widespread flooding—Malaysia alone saw over 130,000 displaced, especially in Kelantan. Singapore had its 7th wettest January since 1980 due to monsoon surges. Meanwhile, Myanmar reported intense low-pressure systems over the Bay of Bengal and recorded new rainfall and temperature extremes across multiple stations.

During DJF2024-25, Vietnam experienced cold spells in January and February, while Myanmar recorded temperature extremes with new highs and lows in some stations. In Thailand, onset of cooler weather was delayed due to prolonged rainfall into late October 2024, influenced by La Niña conditions.

REFERENCES

CHIRPS: Funk et al. 2014: A quasi-global precipitation time series for drought monitoring: U.S. Geological Survey Data Series 832, 4 p., doi:110.3133/ds832.

ERA5: Hersbach et al. 2019: Global reanalysis: goodbye ERA-Interim, hello ERA5. ECMWF Newsletter, doi:10.21957/vf291hehd7.