AGROCLIMATIC ANALYSIS & OUTLOOK

APRIL 2025

PREPARED BY

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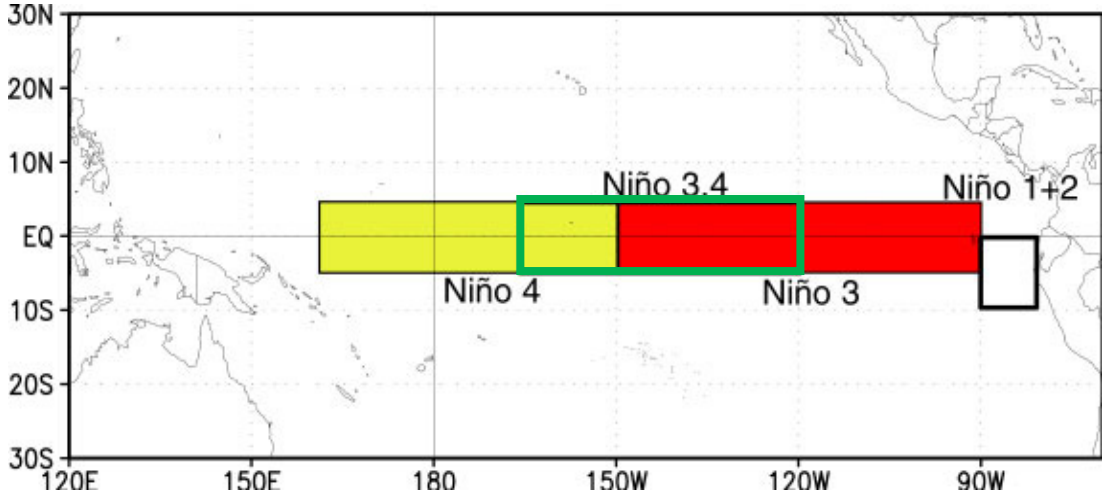
1.0 ENSO (El Niño Southern Oscillation) Outlook

Research conducted over recent decades has shed considerable light on the important role played by interactions between the atmosphere and ocean in the tropical belt of the Pacific Ocean (Figure 1) in altering global weather and climate patterns. During El Niño events, for example, sea temperatures at the surface in the central and eastern tropical Pacific Ocean become substantially warmer than normal. In contrast, during La Niña events, the sea surface temperatures in these regions become colder than normal. These temperature changes are strongly linked to major climate fluctuations around the globe and, once initiated such events can last for 12 months or more. The strong El Niño event of 1997-1998 was followed by a prolonged La Niña phase that extended from mid-1998 to early 2000. **El Niño/La Niña events change the likelihood of particular climate patterns around the globe, but the outcomes of each event are never exactly the same**. Furthermore, while there is generally a relationship between the global impacts of an El Niño/La Niña event and its intensity, there is always a potential for an event to generate serious impacts in some regions irrespective of its intensity.

In March 2025, ENSO-neutral conditions returned, with below-average sea surface temperatures (SSTs) weakening in the central and east-central equatorial Pacific Ocean. The westernmost Niño index values were near zero, while positive index values persisted in the easternmost Niño-3 and Niño-1+2 regions. Below-average subsurface temperatures weakened, but negative anomalies continued in the central equatorial Pacific, extending to 250m depth. A shallow layer of above-average subsurface temperatures continued in the far eastern equatorial Pacific. Low-level wind anomalies remained easterly over the western and central Pacific, while upper-level wind anomalies were westerly over the central Pacific. Convection was suppressed around the Date Line and was enhanced near Indonesia. The traditional and equatorial Southern Oscillation indices were positive. Collectively, the coupled ocean-atmosphere system reflected ENSO-neutral conditions.

The IRI and North American multi-model ensemble indicate ENSO-neutral will continue through the summer. The forecast team also favors ENSO-neutral, with chances well over 50% through summer 2025. Because of reduced forecast accuracy in the spring, the uncertainty increases at longer time horizons, with a 43% chance of ENSO-neutral and a 38% chance of La Niña during November 2025 - January 2026 (chances of El Niño are under 20%). In summary, ENSO-neutral is favored during the Northern Hemisphere summer, with a greater than 50% chance through August-October 2025 (Source: Climate Prediction Center/NCEP/NWS and the International Research Institute for Climate and Society).



Niño 3 Location

Niño 4 Location

Figure 1: The location of The Niño Regions

2.0 Weekly Sea Surface Temperature (SST) Departures during the Last Four Weeks

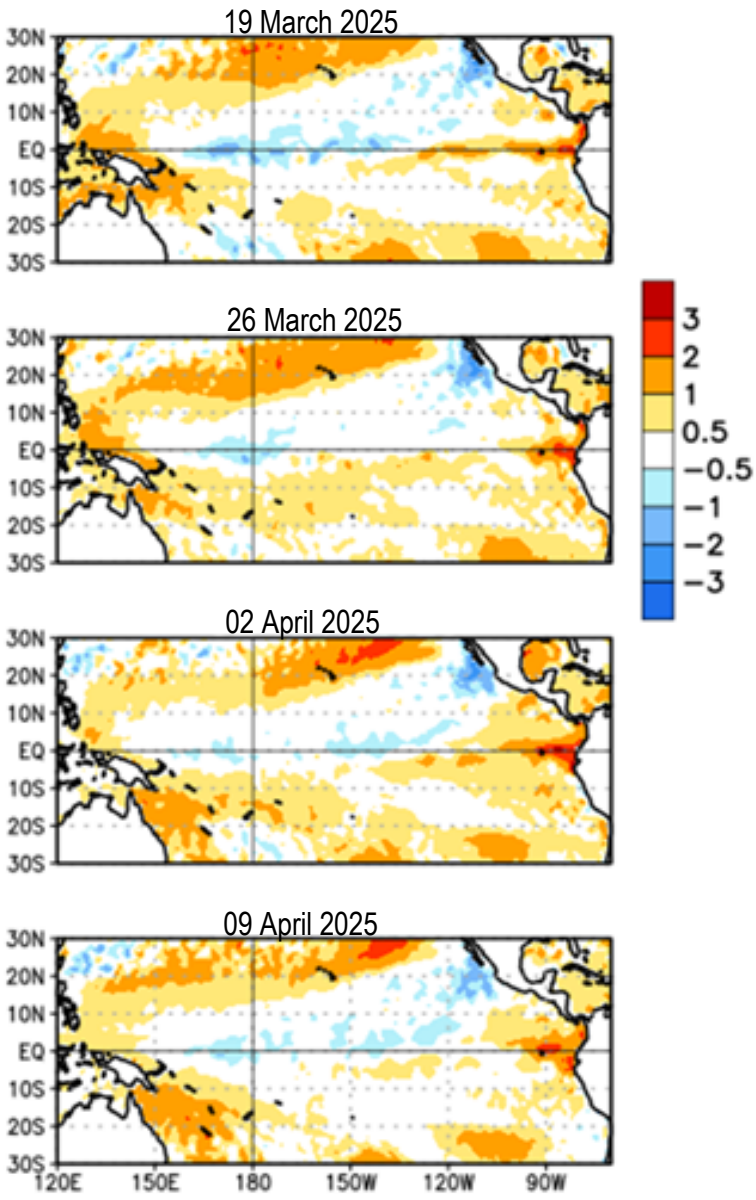


Figure 2: During the last 4 weeks, near-to-below-average SSTs persisted in the central equatorial Pacific Ocean. Above-average SSTs persisted in the eastern Pacific Ocean.

3.0 Overview Characteristics of Inter - Monsoon (April - May 2025)

The Inter monsoon has started beginning on 25th March 2025 and expected to end in mid-May 2023 before our country experiencing Southwest monsoon. During the inter-monsoon season, light and variable winds prevail over Malaysia as the westerly winds over the Indian Ocean and northeasterly winds from South China Sea alternatively varies. During this season, the equatorial trough lies over Malaysia and when typhoons frequently develop over the west Pacific and move westwards across the Philippines, southwesterly winds over the northwest coast of Sabah and Sarawak region may strengthen to reach 20 knots or more.

As Malaysia is mainly a maritime country, the effect of land and sea breezes on the general wind flow pattern is very marked especially during days with clear skies. On bright sunny afternoons, sea breezes of 10 to 15 knots very often develop and reach up to several tens of kilometers inland. On clear nights, the reverse process takes place and land breezes of weaker strength can also develop over the coastal areas.

The Inter monsoon period is normally wetter and is caused by stronger convective activities that enhances thunderstorm activities in the afternoons and evenings. There will be generally an increase in rainfall amount during this coming Inter monsoon as compared to the previous two months. Most areas in the west coast states of Peninsular and inland areas of Pahang, Terengganu and Kelantan as well as Sabah and Sarawak would experience frequent thunderstorms that are often accompanied by heavy rainfall and occasionally strong gusting winds. While other areas in Peninsular would experience less frequent showers and thunderstorms in the afternoon and evening.

4.0 Review of Rainfall for March 2025

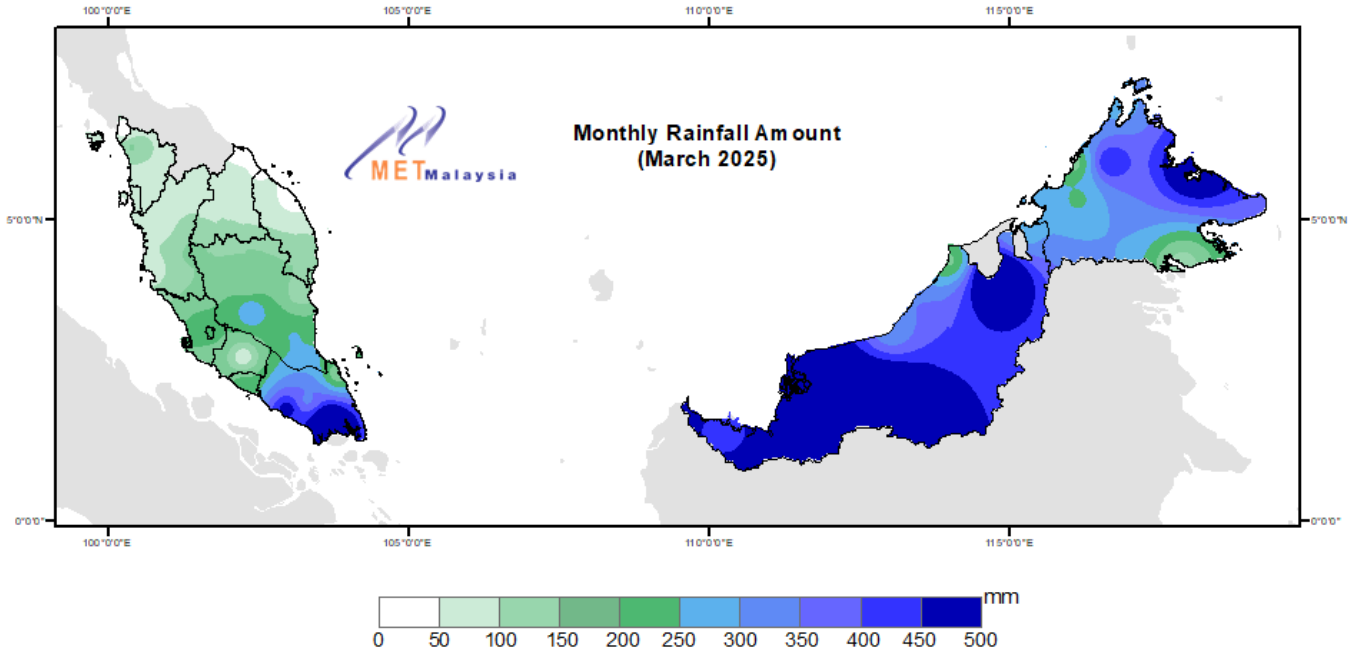


Figure 3: Distribution of Total Rainfall for March 2025

Figure 3 shows the distribution of the total rainfall for March 2025, computed based on data from 42 stations using IDW interpolation method. A closer look at the figures in Peninsular Malaysia highlights Johor as the state with the most significant rainfall, while several northern and east coast states recorded relatively lower amounts. Among all recorded stations, Senai in Johor experienced the highest rainfall at 666 mm while Kota Bharu in Kelantan recorded the lowest (21.8 mm).

Sarawak shows widespread and higher rainfall totals, with multiple exceeding 600 mm and Mulu at the highest (683.2 mm), indicating consistently heavy rain across the state. In contrast, Sabah shows more variation, with eastern areas like Sandakan (585 mm) and Ranau (450 mm) receiving significantly more rain than the west and south, such as Tawau, which recorded the lowest at 131.2 mm.

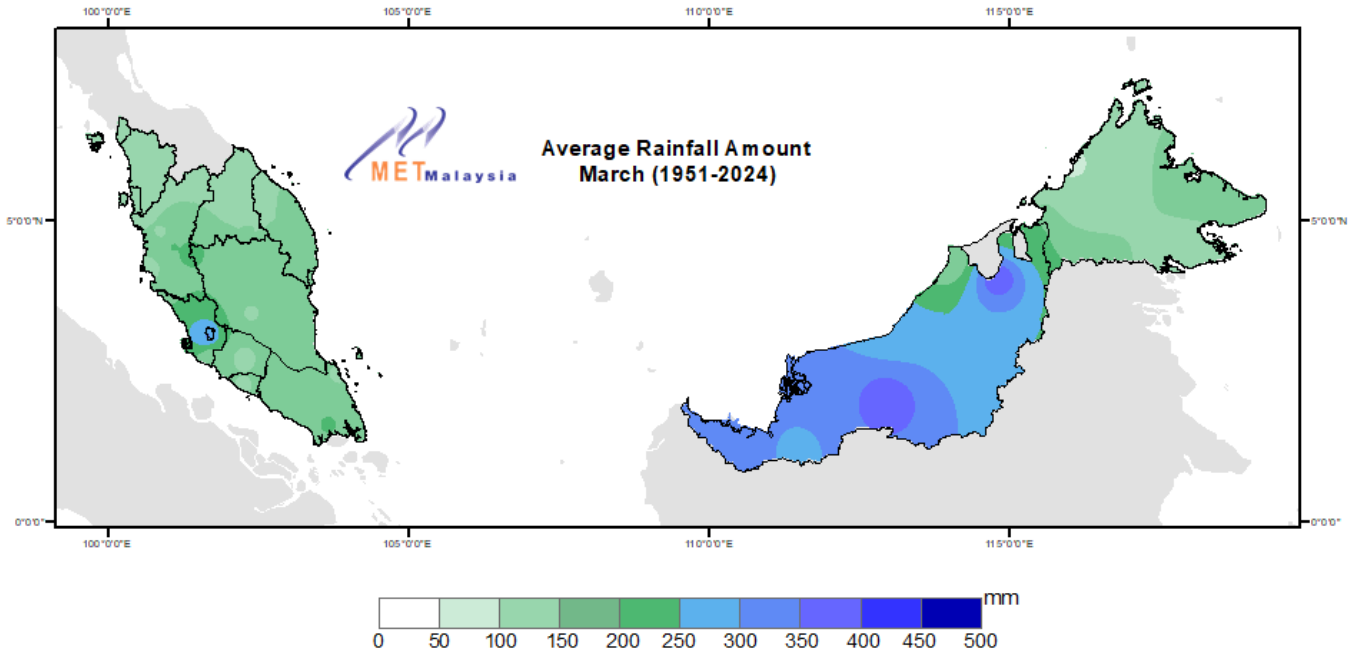


Figure 4: Distribution of Long-Term (1951-2024) Average Rainfall for March

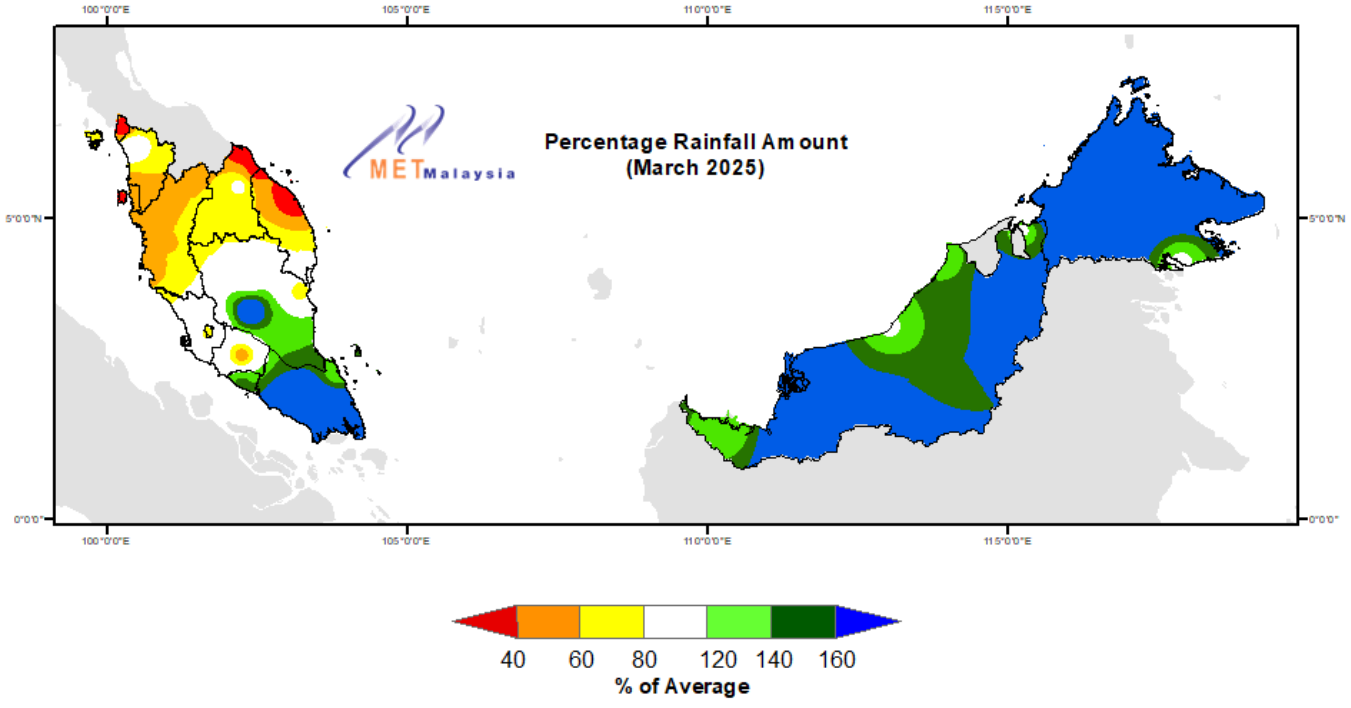


Figure 5: Distribution of rainfall for March 2025 in percentage, compared to the long-term average (1951 - 2024)

The distribution of rainfall for March 2025 was further compared to its long-term average (1951-2024) as shown by both Figure 4 and Figure 5. Most areas in Peninsular Malaysia received average to below-average rainfall with exception of its southern part especially Batu Pahat, Kluang and Senai in Johor, Temerloh and Muadzam Shah in Pahang and Malacca which received more than 20% above average. The rainfall recorded in Senai shows a significant increase of 329% compared to its long-term average of 202.4 mm. Meanwhile the rainfall analysis across Sabah and Sarawak reveals a clear trend of above-average precipitation, with majority recorded levels exceeding 20% of the long-term average. Notably, no stations experienced below-average rainfall, indicating generally wetter conditions across East Malaysia during the month of March.

5.0 Decadal Weather Outlook of 5000ft Wind and Total Rainfall (mm) for 1st – 30th April 2025

The Numerical Weather Prediction (NWP) gridded data from TCC (Tokyo Climate Centre) is used in this outlook. The next sections are the output from TCC NWP climate models with 10 – days time interval called daily decade for Malaysia.

Studies have found that based on climatology, normally from March to May there is an increased rainfall intensity, as the Intertropical Convergence Zone (ITCZ) moves in northern direction over the Peninsular. (L.R. Oldeman and M. Frère, 1982). Southwest to north western part of Peninsular receives more rainfall during this period. While east coast part of Peninsular is drier during this period.

5.1 Rainfall 1st Decade (1st – 10th April 2025)

In Figure 6, the rainfall distribution is expected to range between 40 mm to 100 mm over Peninsular Malaysia. In Sarawak, most areas are expected to receive the amount of rainfall above 70 mm while Sabah is expected to receive below 60 mm. The outlook for wind conditions shows the easterly wind of less than 5 knot over the country (Figure 7).

5.2 Rainfall 2nd Decade (11th – 20th April 2025)

Figure 8 shows the rainfall outlook for the second decade is expected to range between 30 mm to 90 mm over Peninsular Malaysia, above 60 over Sarawak and below 100 mm over Sabah. The second decade as in Figure 9, shows the light and variable wind is expected over the country.

5.3 Rainfall 3rd Decade (21st – 30th April 2025)

The outlook for the third decade in Figure 10 shows the rainfall distribution is expected to range between 30 mm

and 110 mm over Peninsular Malaysia, above 50 over Sarawak and below 60 mm over Sabah. Figure 11 shows the westerly wind of 5 knots is expected over the country.

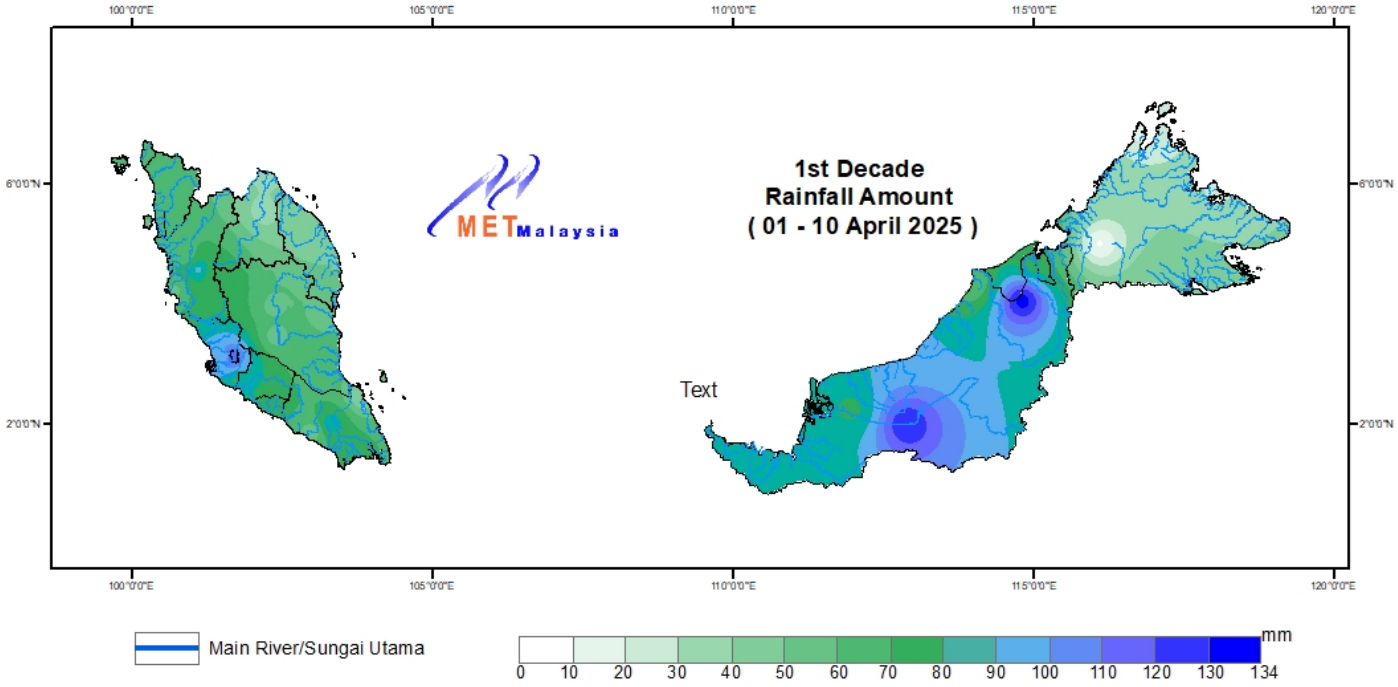


Figure 6: Outlook of Rainfall Distribution for the 1st Decade (01/04 – 10/04/2025)

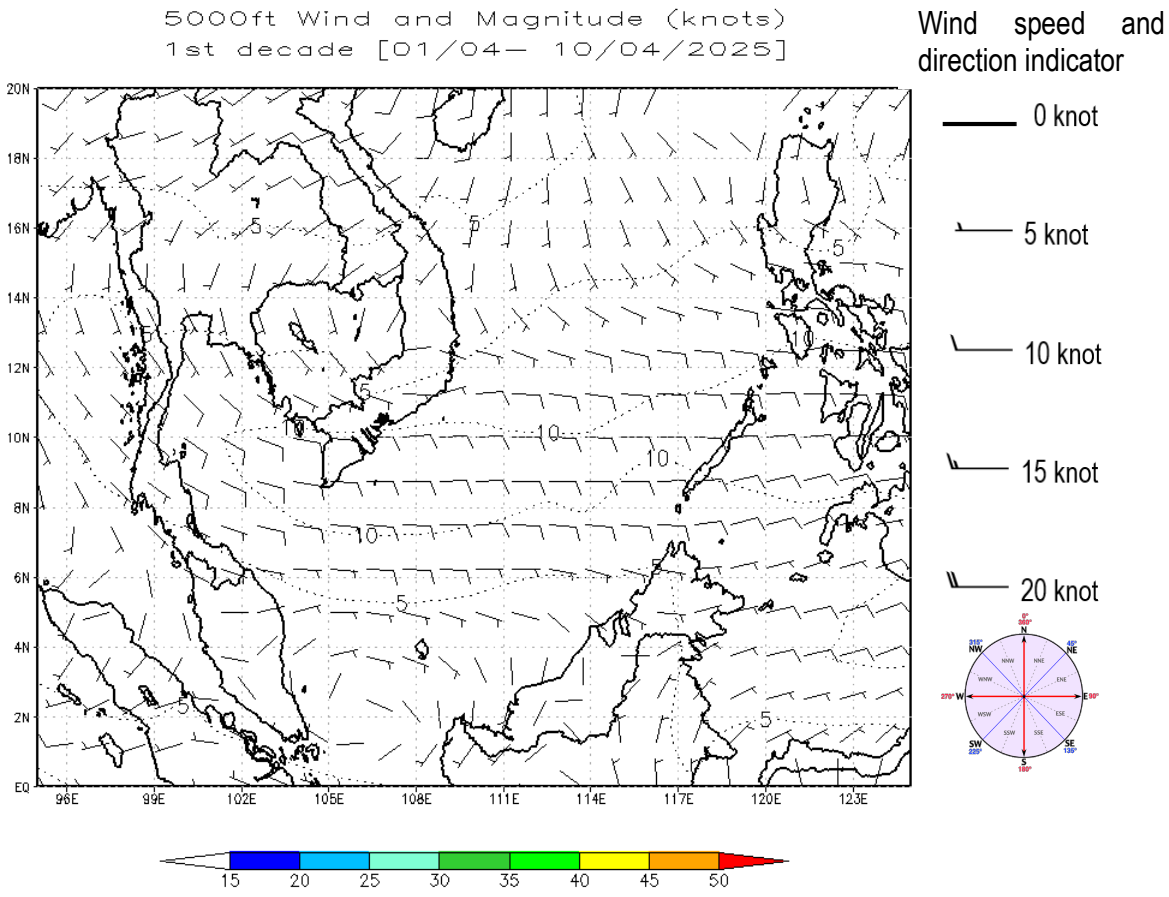


Figure 7: Wind conditions outlook over the region for the 1st decade (01/04– 10/04/2025)

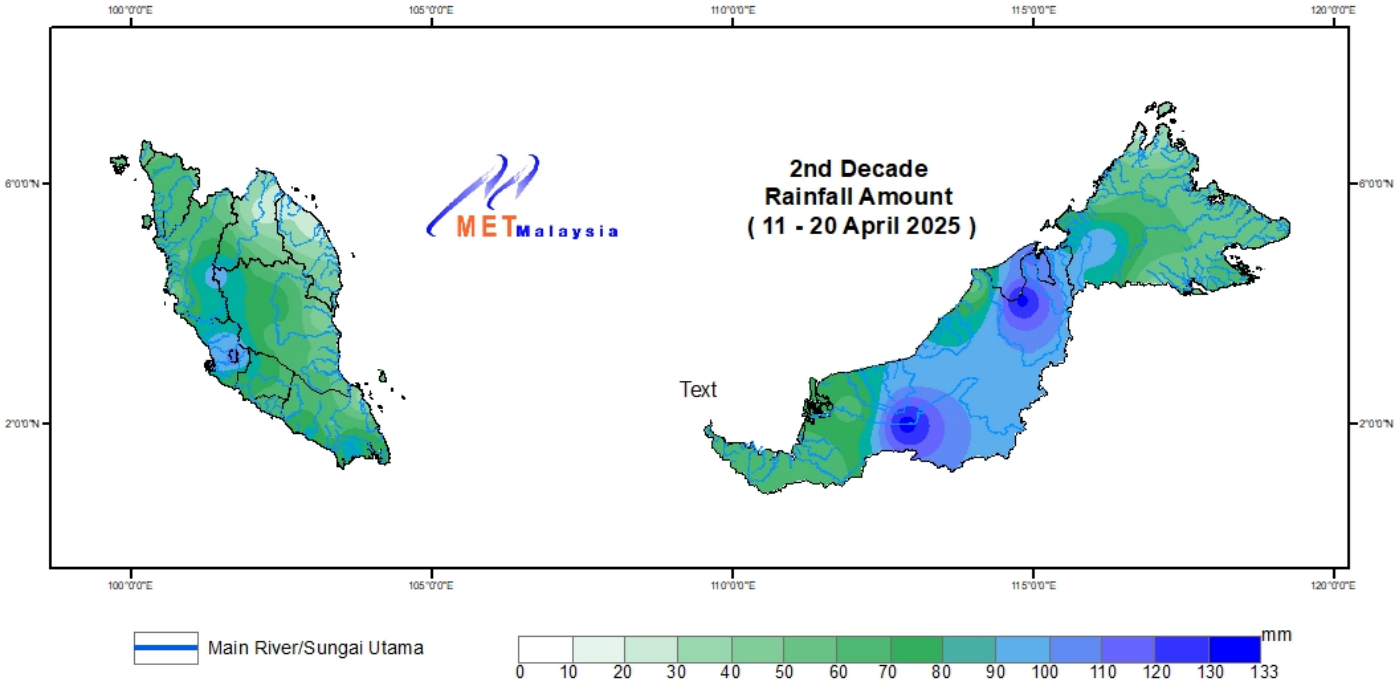
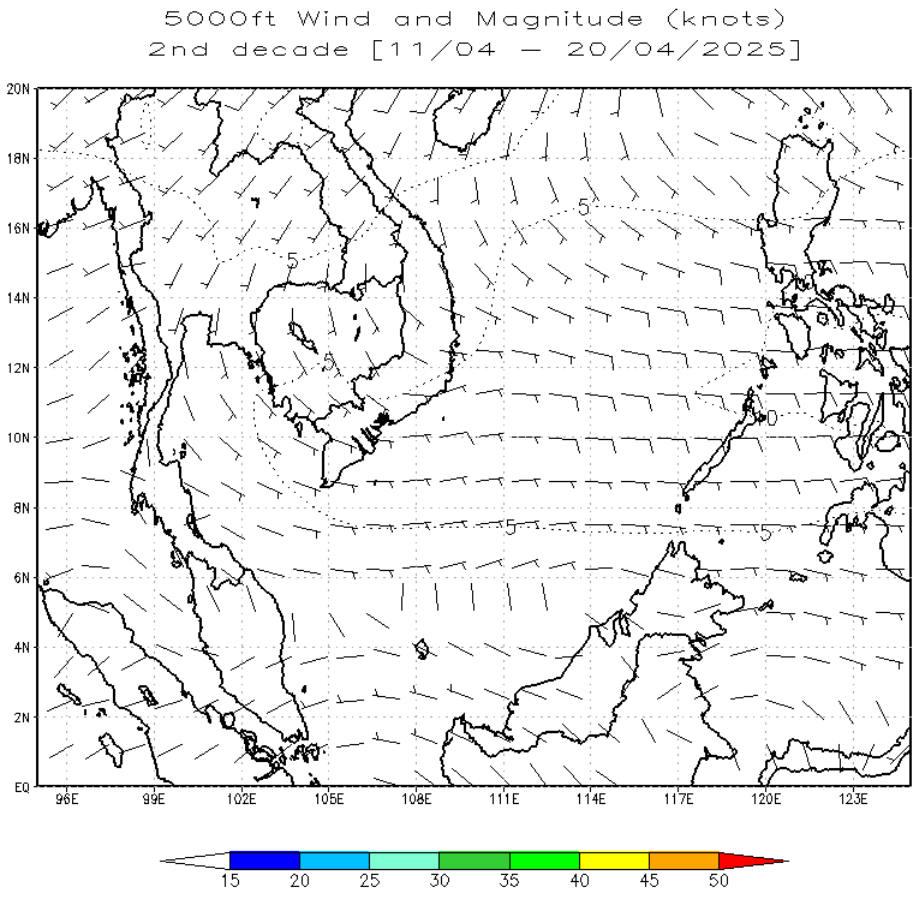


Figure 8: Outlook of Rainfall Distribution for the 2nd Decade (11/04 – 20/04/2025)



Note:
Wind speed and direction indicator

0 knot

5 knot

10 knot

15 knot

20 knot

Figure 9: Wind Conditions Outlook Over the Region for the 2nd Decade (11/04 – 20/04/2025)

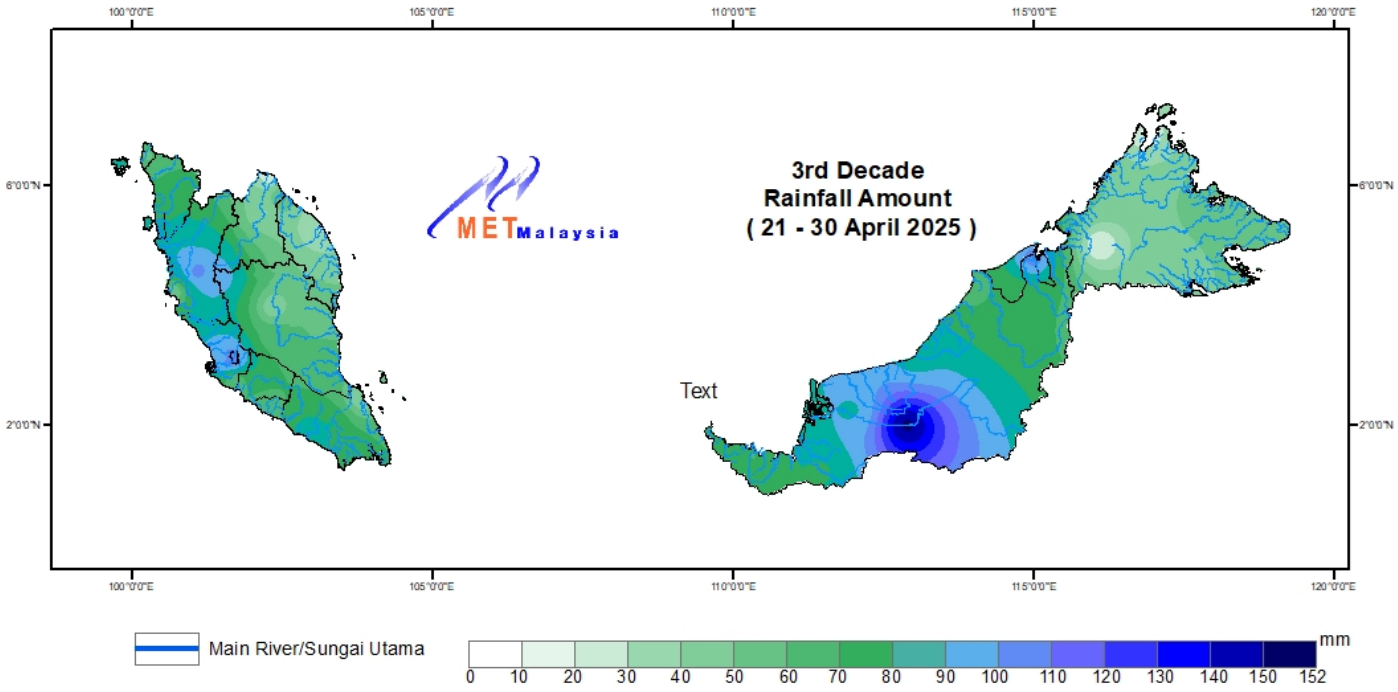


Figure 10: Outlook of Rainfall Distribution for the 3rd Decade (21/04 – 30/04/2025)

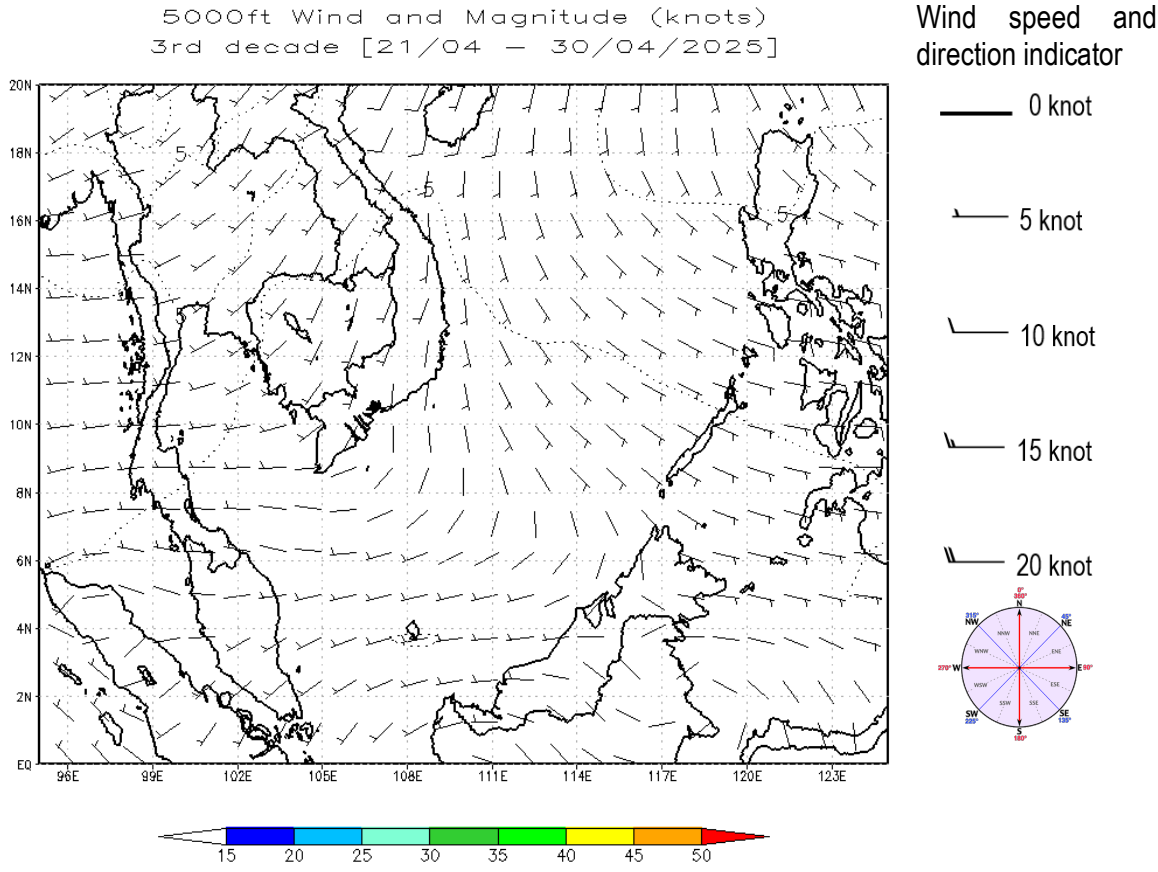


Figure 11: Wind Conditions Outlook Over the Region for the 3rd Decade (21/04 – 30/04/2025)

6.0 General Discussion

MET Malaysia rigorously monitored the El Niño Southern Oscillation (ENSO) conditions for the country. Information from various climate prediction centers was gathered and evaluated by an expert team in the monitoring. Majority of climate models indicate that ENSO-neutral are present with the Oceanic Niño Index (ONI) value for January - March 2025 standing at -0.4 ˚C while the latest weekly temperature anomaly at Niño 3.4 region is -0.1˚C. ENSO-neutral is favored during the Northern Hemisphere summer, with a greater than 50% chance through August-October 2025.

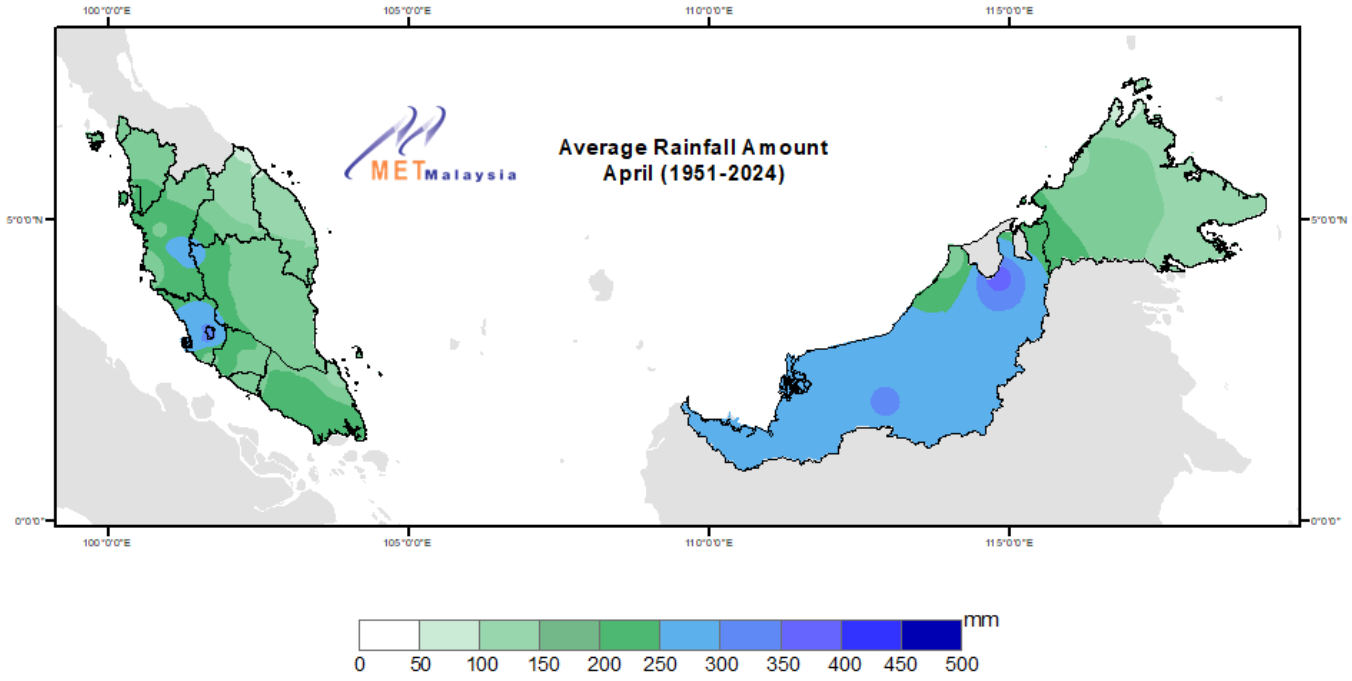


Figure 12: Distribution of Long-Term (1951-2024) Average Rainfall for April

Figure 12 shows the average rainfall distribution from 1951 – 2024 for April as climatic guidance. In Peninsular Malaysia, several west coast and highland stations receive high rainfall exceeding 200 mm while lower rainfall is expected on the east coast. Sarawak generally experiences high average rainfall in April, with most stations recording well over 250 mm of rain while Sabah shows more variation in rainfall, varies between 70 mm. to 190 mm. In summary, April is generally a wet month for many areas across Malaysia, particularly in the west coast of Peninsular Malaysia and central Sarawak, while some coastal and inland areas in the east and north receive less rain.

7.0 Probability of Weather Condition Impact on the Agricultural Sector for April 2025

The consensus of meteorologists, based on model analysis and seasonal predictions issued by **European Centre for Medium-Range Weather Forecast (ECMWF)**, **NCEP coupled forecast system model version 2 (CFSv2), JMA Ensemble Prediction System (Tokyo Climate Centre), Seasonal Climate Forecast, International Research Institute for Climate Society (IRI) and Seasonal Forecast WRF-CFS Met Malaysia;** have concluded for April 2025 weather outlook.

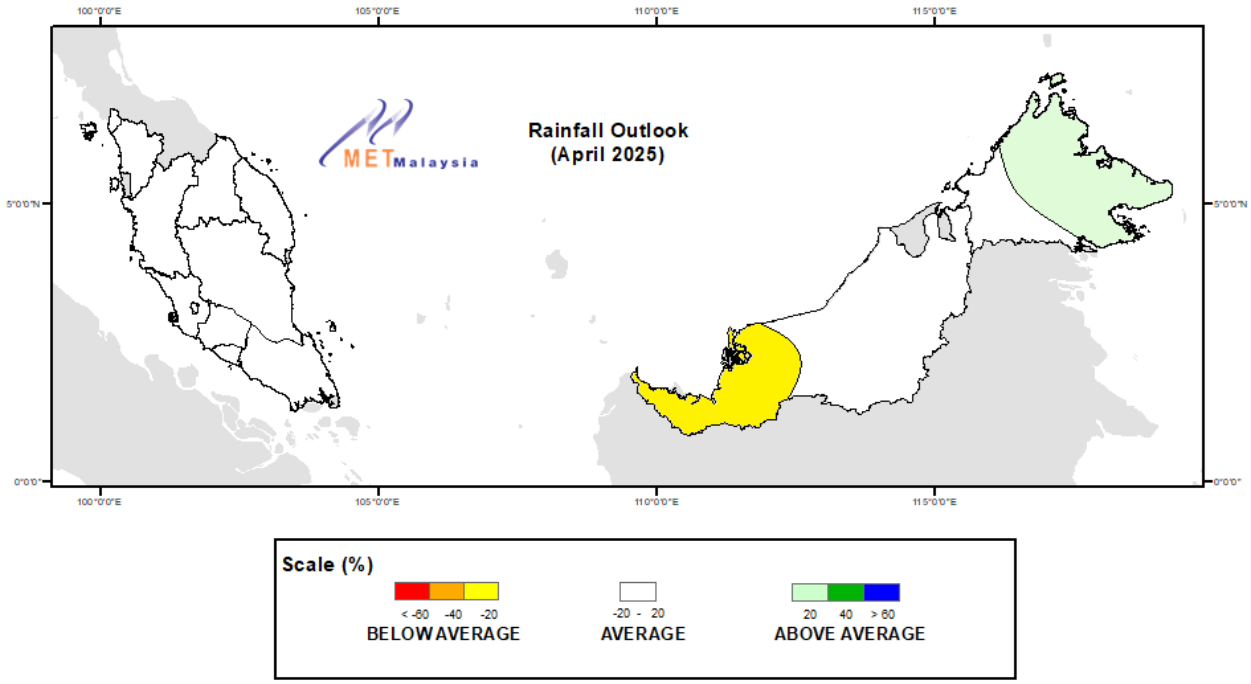


Figure 13: Outlook of Rainfall Distribution for April 2025 in Percentage

In April 2025, all areas in Peninsular Malaysia are expected to receive average amounts ranging from 70 mm to 410 mm. In Sarawak, most parts are forecasted to receive average rainfall ranging from 140 mm to 460 mm, with exception of Kuching, Samarahan, Sri Aman, Betong, Sarikei, Sibu and Mukah which forecasted to receive slightly below average between 160 mm and 210 mm of rainfall. Meanwhile in Sabah, most parts are forecasted to receive above-average rainfall ranging from 90 mm to 250 mm except West Coast and Interior Division which forecasted to receive average rainfall between 100 mm and 250 mm.

Two main crops identified as a large commodity source in Malaysia are rice and palm oils. Studies conducted had found their best growth conditions. Hence from these studies, the agricultural sector has concluded that monthly rainfall amounts of **200 – 300 mm** for the **rice** crops and **150 – 200 mm** for the **palm oil** crops are needed to support their best growth. In April 2025, all areas in Kelantan (except Gua Musang), Terengganu, Mersing in Johor and Kudat

in Sabah are expected to receive a lower range of rainfall for rice crops and palm oils (less than 150 mm), while the rest of the states have met the minimum requirement for both crops. Thus, good management of the irrigation system is needed to support the growth of crops.

However, water demands for various crops differ during their subsequent growth stages. Not only are crops more sensitive during certain stages, but also the rooting depth and the soil moisture reservoir change during their growth (L.R. Oldeman and M. Frère, 1982). These factors also need to be better understood in order to increase the yield of the crops.

Info Note: Fourth Biennial Update Report to the UNFCCC

In 2011, policies on food production and agro - commodities were separated and developed under two distinct policy documents, namely the National Agrofood Policy (2011-2020) and the National Commodity Policy (2011-2020). For the post 2020 period, agriculture development is being guided by the National Agrofood Policy 2021- 2030 and the National Agri-Commodity Policy 2021-2030. Sustainable development is a key principle in both policies besides strengthening the two subsectors' contributions to food security and socio-economic development.

Agricultural Crops -The agriculture area consists of primarily commodity crops such as oil palm, rubber and cocoa. Paddy is also an important agricultural crop and the planted areas involved double cropping. Table 1.25 reflects the changes in planted areas of major agricultural crops in selected years between 2005 and 2019.

Table 1.25: Planted Areas of Major Agricultural Crops

Year	Crops ('000 ha)			
	Rubber	Oil Palm	Cocoa	Paddy
2005	1,271.3	4,051.4	34.0	666.8
2015	1,074.5	5,642.9	18.1	681.6
2016	1,078.0	5,738.0	17.4	688.8
2017	1,081.7	5,811.1	17.5	685.5
2018	1,127.0	5,849.3	15.6	699.9
2019	1,131.9	5,900.1	5.9	672.1

Sources: Ministry of Agriculture and Food Security; Ministry of Plantation and Commodities

Malaysia's Fourth Biennial Update Report to the UNFCCC, Ministry of Natural Resources, Environment and Climate Change, Malaysia 2022. (Page 27)

a. For a general description of the current Long-Range Weather Outlook and ENSO event please refer to our web page: https://www.met.gov.my/data/climate/tinjauancuacajangkapanjang.pdf

b. For detailed report on drought monitoring, please refer to our web page: - https://www.met.gov.my/data/climate/kemarau.pdf

c. The El-Niño conditions are updated (on a necessary time basis) by MET Malaysia at: https://www.met.gov.my/data/climate/status_elnino.pdf

El Nino Southern Oscillation (ENSO) is a planetary scale atmosphere oceanic phenomenon that has an impact on global climate including our region. In particular, during an intense ENSO event for example in 1997, our region will experience drier weather conditions.

Last update: 22 April 2025