Photo by Gilang Aria Seta - WFP

Feb 2024

INDONESIA

A joint collaboration by:

Seasonal Monitoring Bulletin

October – December (Q4) 2023

BMKG · BNPB · BADAN PUSAT STATISTIK · BAPPENAS · BADAN PANGAN NASIONAL · BRIN · WFP

Photo by Gilang Aria Seta - WFP

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Key Messages

Start of the Rainy Season: The Meteorological, Climatological, and Geophysics Agency (BMKG) stated that most areas had entered the rainy season. However, the number of seasonal zones already experiencing rainfall was significantly lower in comparison with long-term average.

Peak of rainy season: BMKG predicts that the peak of the rainy season will occur in the first quarter of 2024, particularly in southern Sumatra, northern Sulawesi, southern Kalimantan, Java, and Papua.

Status of Food Security: According to the National Food Agency (NFA), more than half of all provinces in Indonesia were considered food secure by December 2023. Out of 34 provinces, 21 were categorized as stable. However, compared to December of the previous year, the number of provinces facing potential deterioration in their food security is higher.

Flood disturbances to paddy crops: According to Ministry of Agriculture (MoA), floods has disrupted the growth of paddy crops from October to December 2023. Aceh suffered the most, with floods affecting more than 7500 hectares of paddy fields in December 2023, leading to harvest failures covering more than 1800 hectares.

Hydrometeorological hazards increased: Indonesia's National Disaster Management Agency (BNPB) reported 1,871 disasters between October and December 2023. This represents a 110% increase compared to the same period in 2022 (890 disasters). The most affected provinces were West Java and East Kalimantan. About 40% percent of these disasters are attributed to hydrometeorological hazards.

Continued impact of El Niño: BMKG predicted that moderate El Niño condition is expected to persist throughout the first quarter of 2024.

SEASONAL MONITORING

RAINFALL ANALYSIS

VEGETATION MONITORING

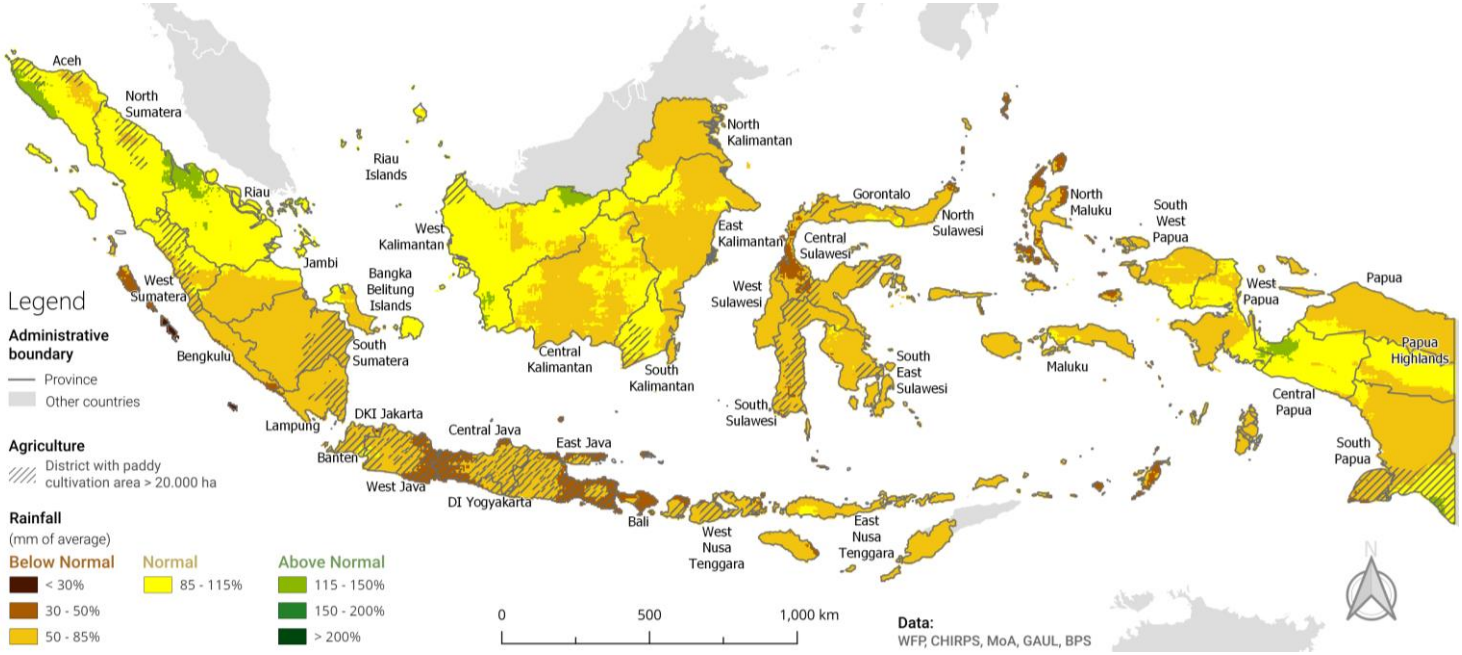
TEMPERATURE MONITORING

SEASONALITY STATUS

DISASTER MONITORING

Rainfall Analysis: October – December 2023

The accumulation of rainfall in comparison to 30-year average (1991-2020)

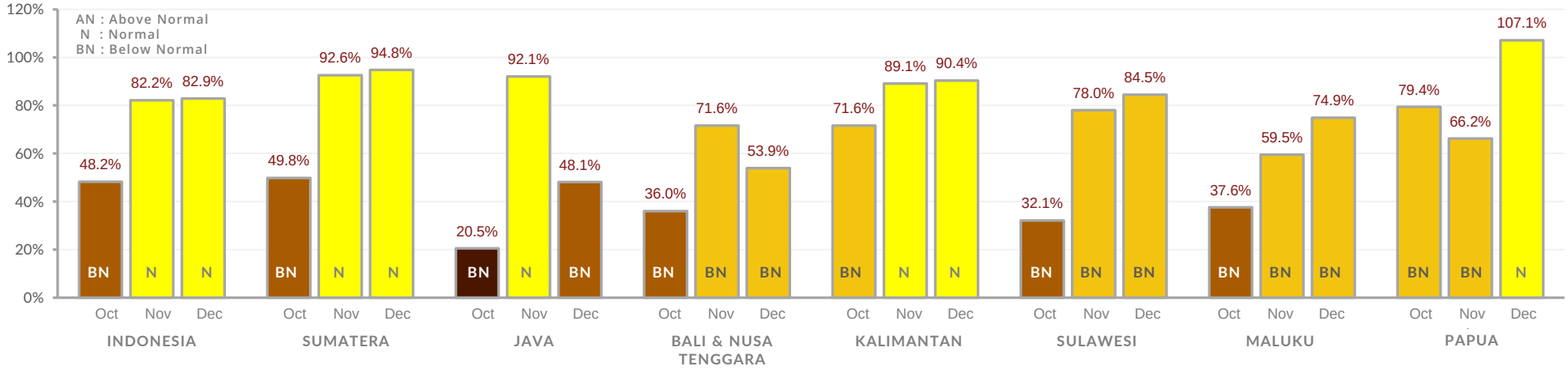


Between October and December 2023, Indonesia experienced below-average rainfall compared to the long-term average for the same three-month period. A significant decrease of rainfall during October to December were happening in most provinces.

In October, 33 provinces experienced dry conditions, followed by 23 provinces in November, and 17 provinces in December.

As presented in the graph below, drier than normal conditions were experienced in Java, Bali, Nusa Tenggara, Sulawesi Maluku, and some parts of Sumatera, Kalimantan, and Papua.

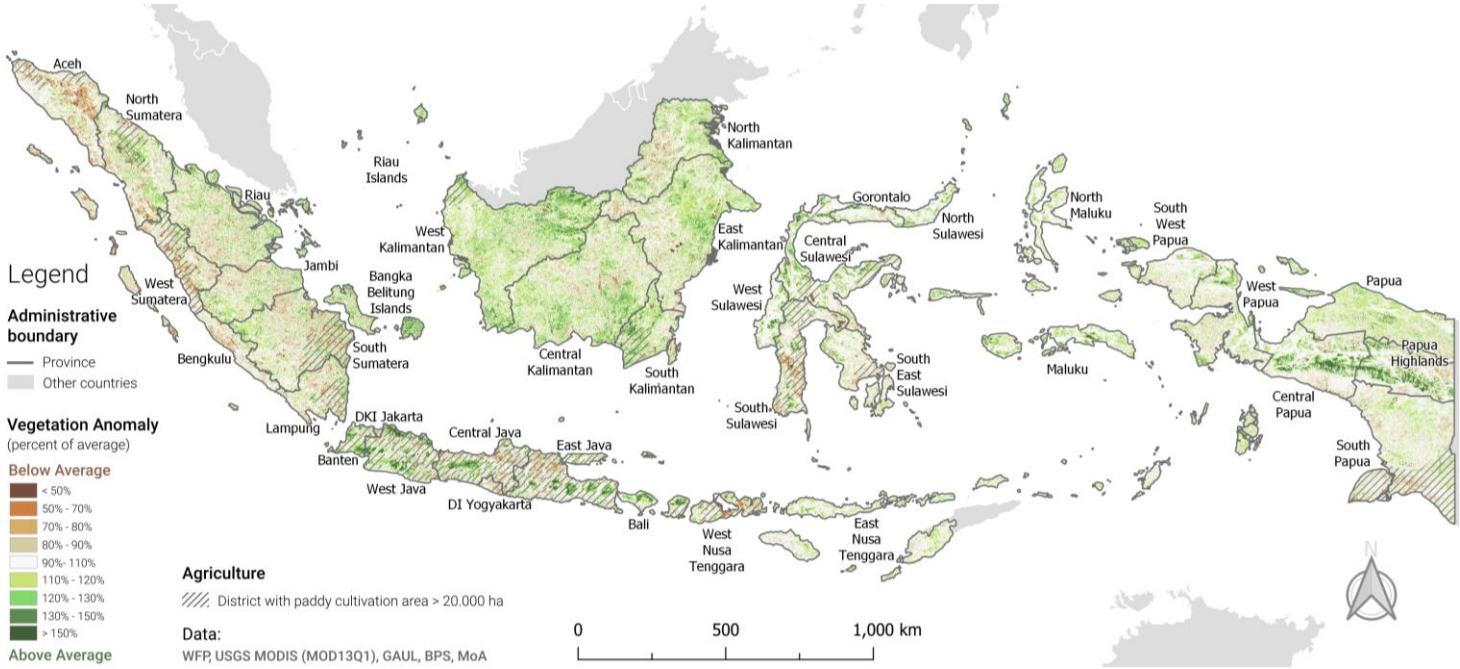
Rainfall Analysis by Region: October -December 2023



Rainfall data source: https://data.chc.ucsb.edu/products/CHIRPS-2.0/

Vegetation Monitoring: October – December 2023

Overall vegetation conditions in comparison to 20-years average (2001-2020)



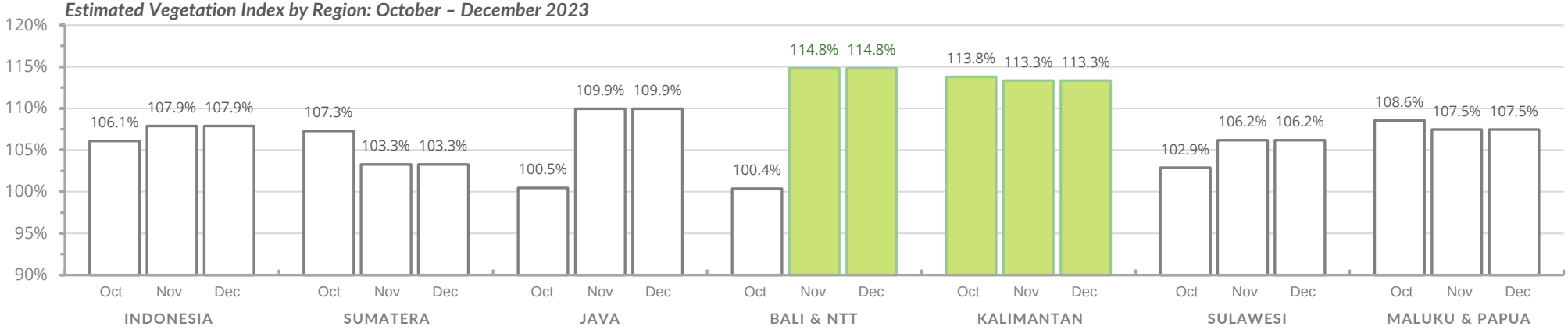
Note: Above average Vegetation indicates an increase in vegetation greenness, which may correlate to healthy vegetation or crops. In contrast, a below-average indicates lower vegetation density and plant health due to environmental stressors, such as climatic hazards, land usage, and land cover changes.

In comparison to long term trends, the Vegetation Index (VI) showed some variation, though remained within the normal range between October and December 2023.

Average VI was observed across Sumatera, Java, Sulawesi, Maluku, and Papua while above-average VI was observed in Bali, Nusa Tenggara, and Kalimantan. However, some provinces, including Aceh, West Sumatera, Bengkulu, and Central Java experience below-average VI.

On the other hand, small variations of above-average VI was observed in West Kalimantan, South Kalimantan, Central Papua, and Papua Highlands.

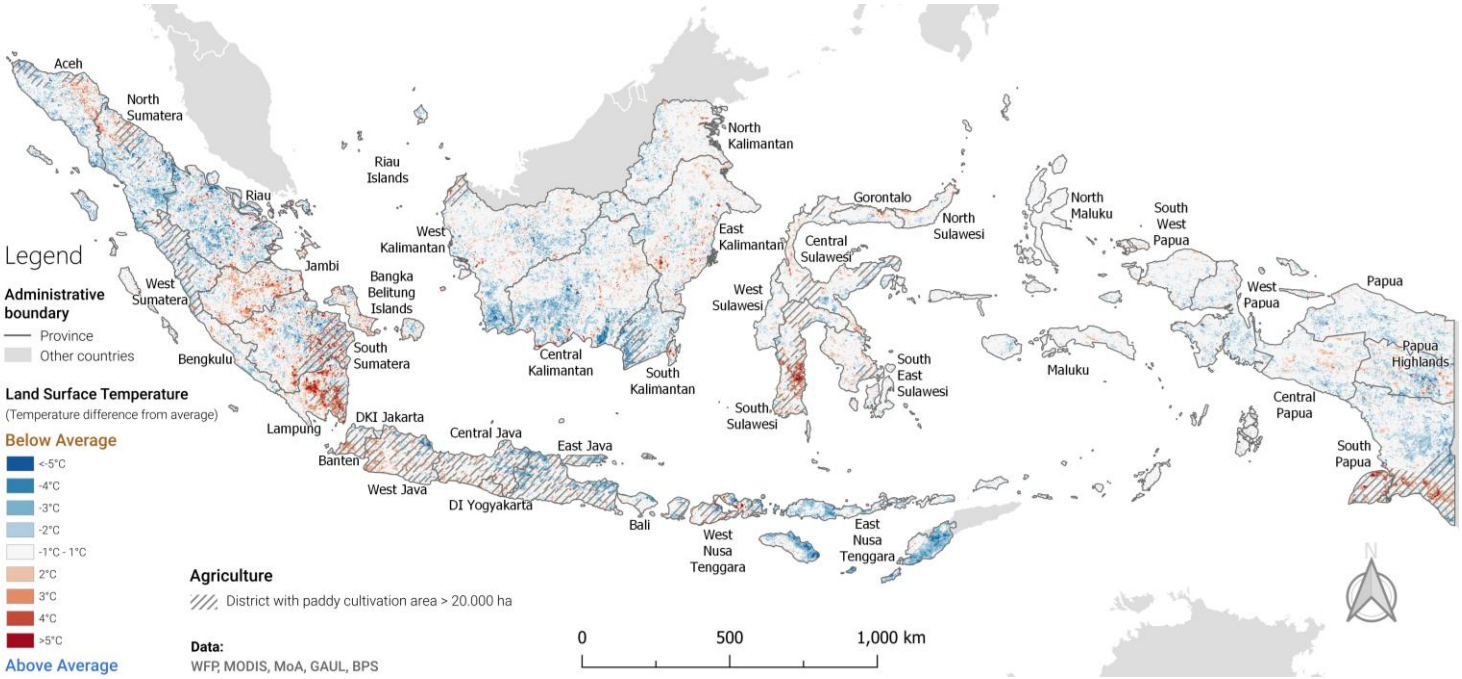
Estimated Vegetation Index by Region: October – December 2023



NDVI data source: https://lpdaac.usgs.gov/products/mod13q1v061/

Temperature Monitoring: October – December 2023

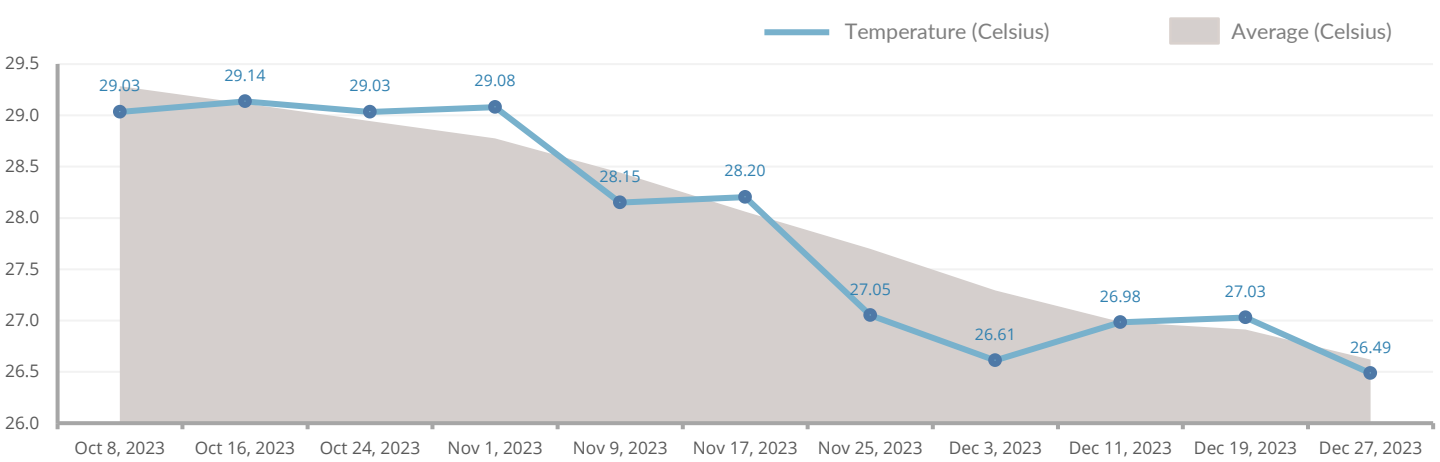
Surface temperature difference in comparison to 20 years of data average (2001-2020)

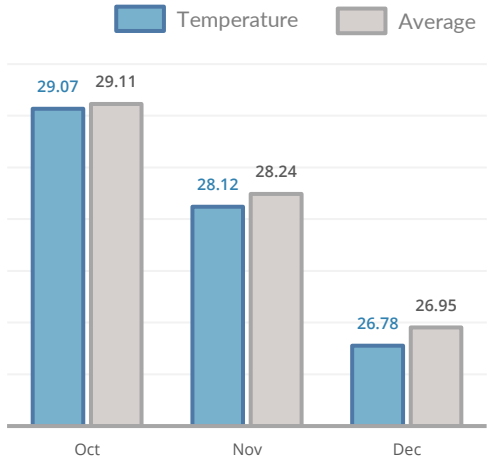


Throughout the final quarter of 2023, the average land surface temperature over Indonesia was slightly lower compared to the long-term average for the same period.

The week-to-week variation indicates that from the first week of November onwards, the surface temperature began to decline towards the year's end. This trend is anticipated as certain regions of Indonesia enter the rainy season.

Below-average surface temperatures were observed in several provinces in Sumatra, Kalimantan, and Papua. On the contrary, the western part of Java and the southern part of Sumatra, Sulawesi, and Papua experienced higher-than-normal surface temperatures.

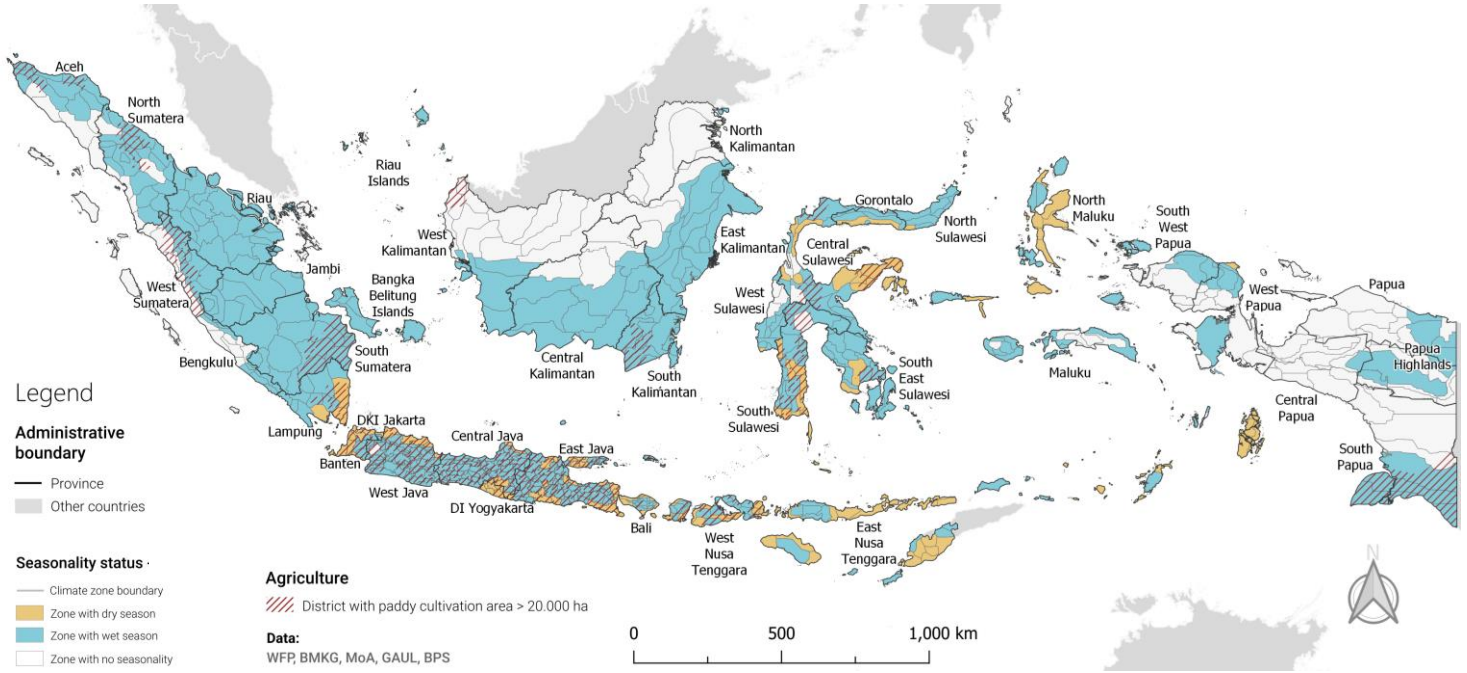




Surface temperature data source: https://lpdaac.usgs.gov/products/mod11a2v061/

Seasonality Status: January 2024

Seasonal zone that currently experience dry or rainy season

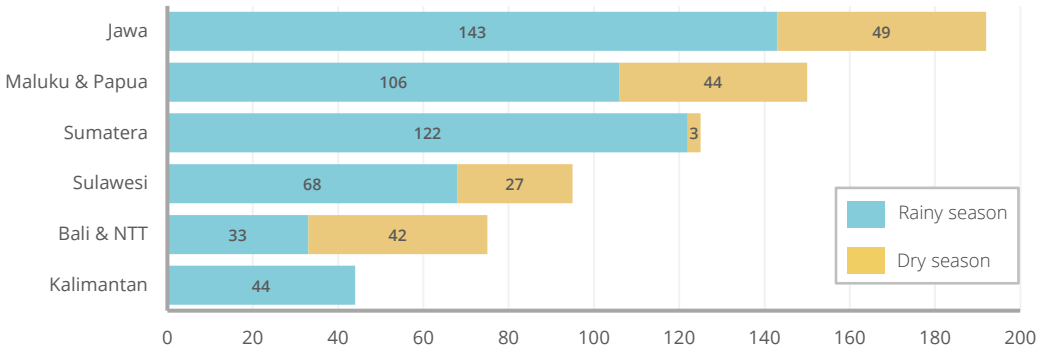


Rainfall patterns in Indonesia can be characterized into three types: monsoonal, equatorial, and local. Given this condition, the distribution of rainfall patterns for each seasonal zone may vary based on regional and local factors.

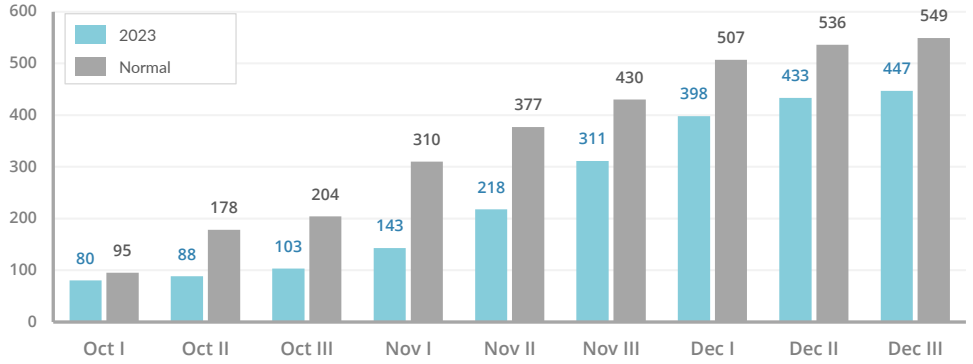
The latest report published in January 2024 from the Meteorological, Climatological, and Geophysical Agency (BMKG) highlighted 492 (70%) out of the total 699 seasonal zones already entered the rainy season. Only 94 (13%) of the seasonal zones are still experiencing dry season, this includes areas in Lampung, Banten, D.I Yogyakarta, East Java, The Nusa Tenggaras, Central Sulawesi, South Sulawesi, and North Maluku.

In comparison with the long-term average, as depicted in the chart below, the number of seasonal zones that already entered in rainy season is significantly lower.

Seasonality Status: January 2024



Number of seasonal zone with Rainy Season in 2023 compared to long-term average

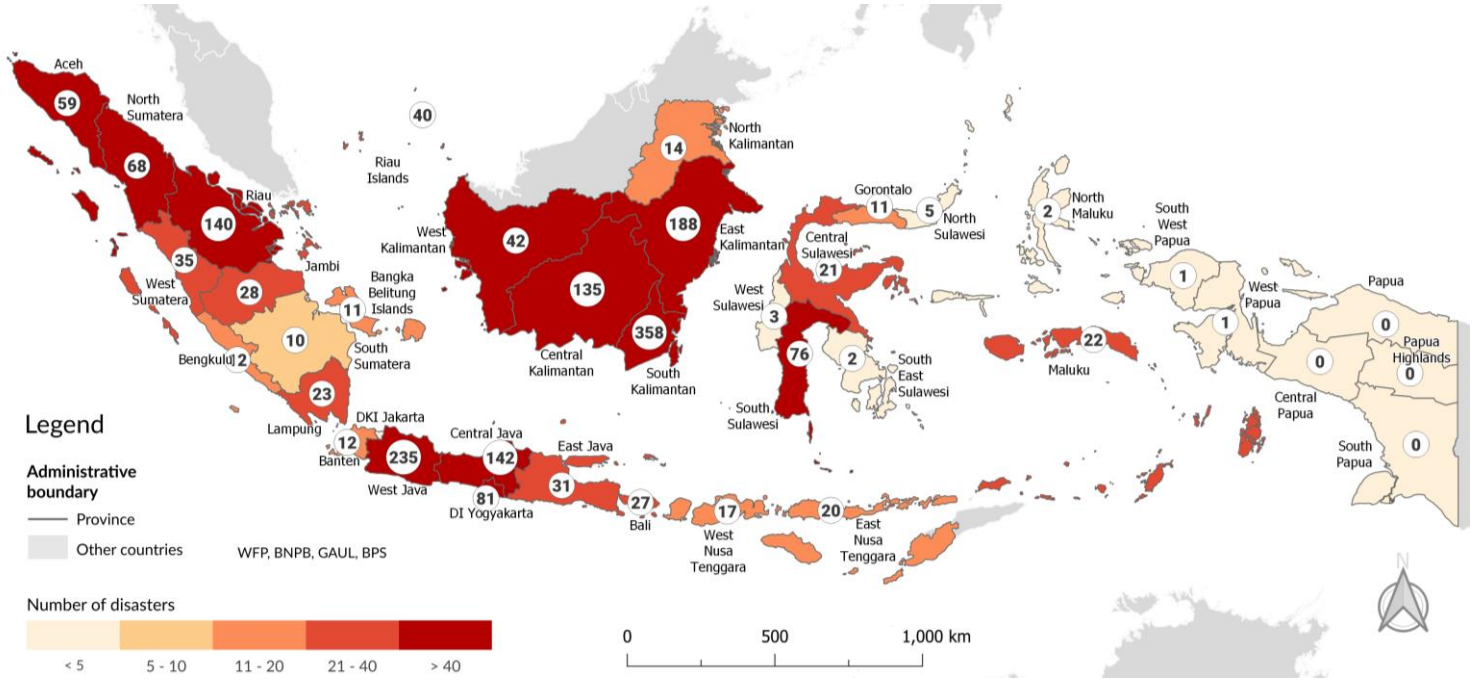


BMKG Seasonality Status: https://cdn.bmkg.go.id/web/02.-Dinamika-Atmosfer-Dasarian-II-Januari-2024.pdf

Seasonal Zone is an area where the average rainfall pattern has a clear difference between the dry season and the rainy season. Areas where the average rainfall pattern does not have a clear difference between the dry season and the rainy season are called Non-Seasonal Zones. The area of a seasonal zone is not always the same as the area of a government administrative area. Thus, one seasonal zone can consist of several districts, and conversely one district area can consist of several seasonal zones.

Disaster Monitoring: October – December 2023

Number of reported disasters by the National Disaster Management Agency



The National Disaster Management Agency reported 1871 disasters between October and December 2023. This represents a 110% increase compared to the same period in 2022 (890 disasters). The most affected provinces were West Java and East Kalimantan.

About 40% of these disasters were attributed as hydrometeorological (731 out of 1871). The hydrometeorological disasters happened in the fourth quarter of 2023 are slightly lower in comparison to 2022 within the same time period. However, the number of drought disasters during this period has increased significantly.

In comparison to the same period in 2022, the number of people impacted by disasters and damaged infrastructures increased by about 85 % this year.

	Flood	Extreme Weather	Landslide	Land & Forest Fire	Tidal Wave & Abrasion	Earthquake	Drought	TOTAL DISASTERS	Damaged Infrastructures	Impacted Population
2023 Oct - Des	257	289	124	1,134	7	6	54	**1,871**	9,443	3,565,831
2022 Oct - Des	479	212	169	17	5	8	0	**890**	66,735	2,406,052
	-46.35%	+36,32%	+26,63%	+6570,6%	40%	-25.0%	+5400%	+110,22%	+85.59%	+86.32%

BNPB Disaster Monitoring: BNPB

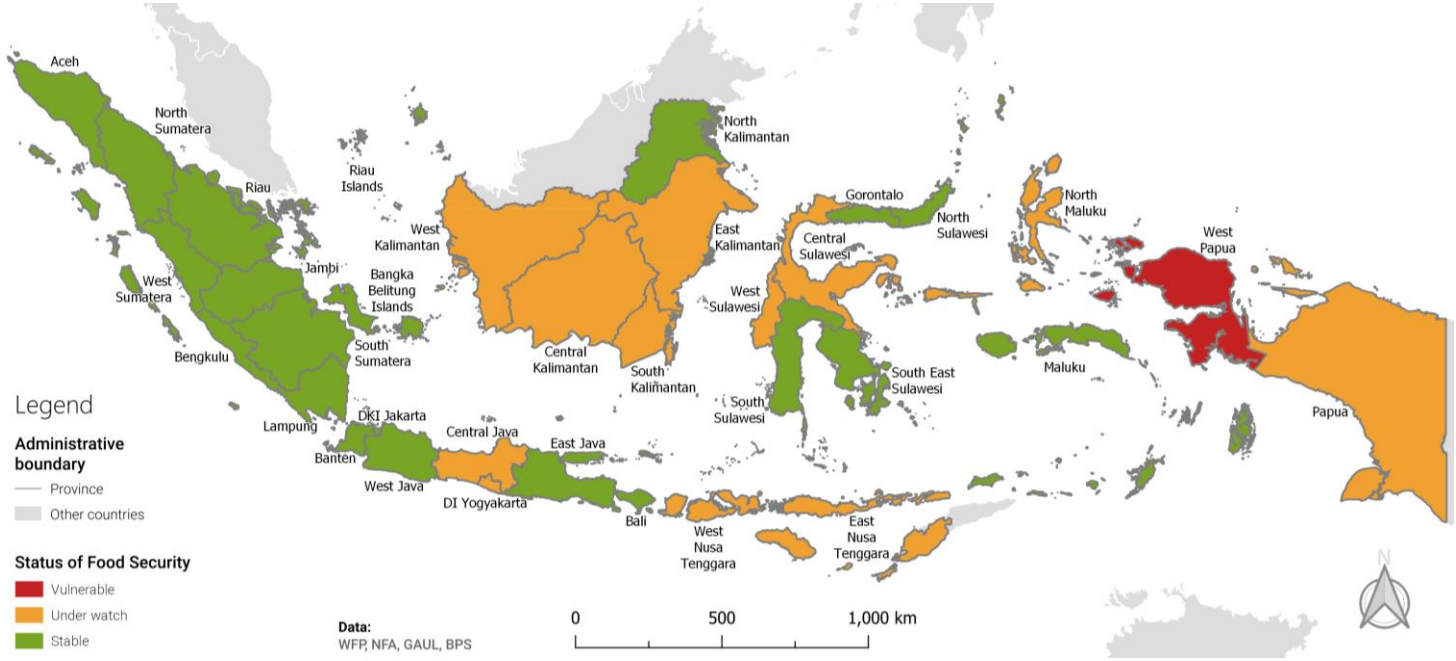
FOOD SECURITY

STATUS OF FOOD SECURITY

DISTURBANCES TO PADDY CROPS

Status of Food Security: December 2023

SKPG: Composite Food Security Index Map

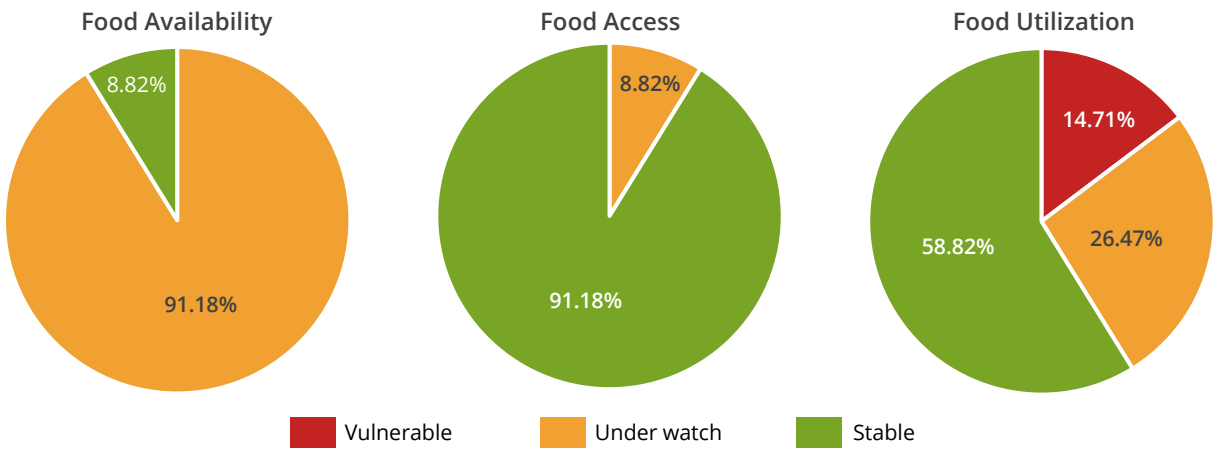


Food access remained stable for most of Indonesia. However, according to analysis of the Food and Nutrition Awareness System (SKPG) (December 2023), 12 provinces were categorised as “under watch” category for possible degradation of food and nutrition security. Whilst, one province, West Papua is the only province categorised as "Vulnerable".

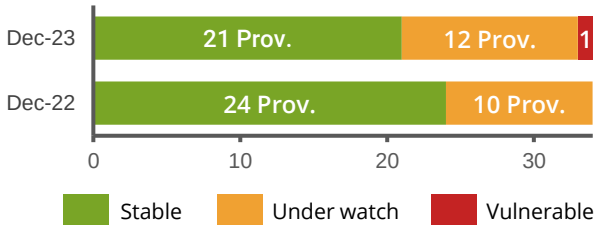
More than 90% of provinces are categorized as under watch with respect to Food availability, one of the three pillars of food security.

In December 2023 analysis, approximately 60 percent of the provinces were in in stable condition. Yet, 25 percent of the provinces were categorised as "Under watch" and 15% were categorized as “Vulnerable”.

In comparison with the food security and nutrition status from December 2022, the number of provinces under the "Under Watch" category has increased by two, and one additional province is now classified as "Vulnerable."

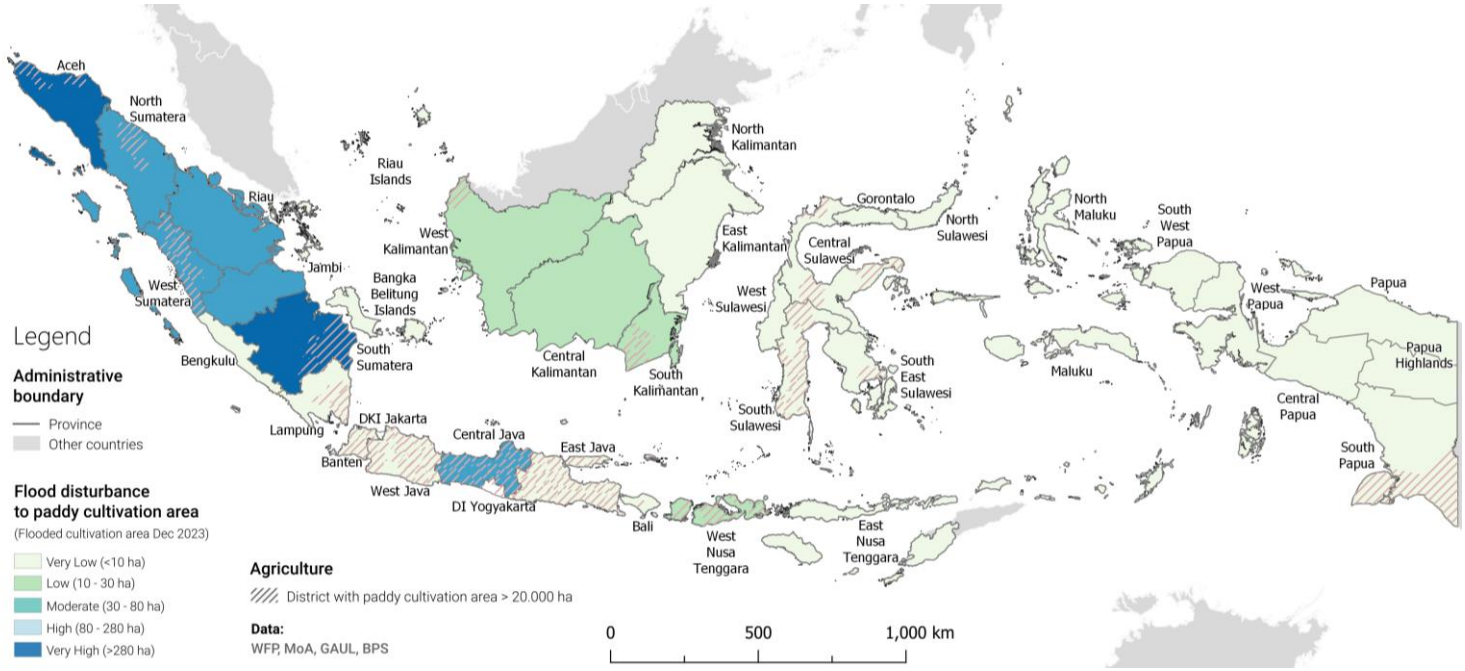


Comparison of Food Security Status
2022 & 2023

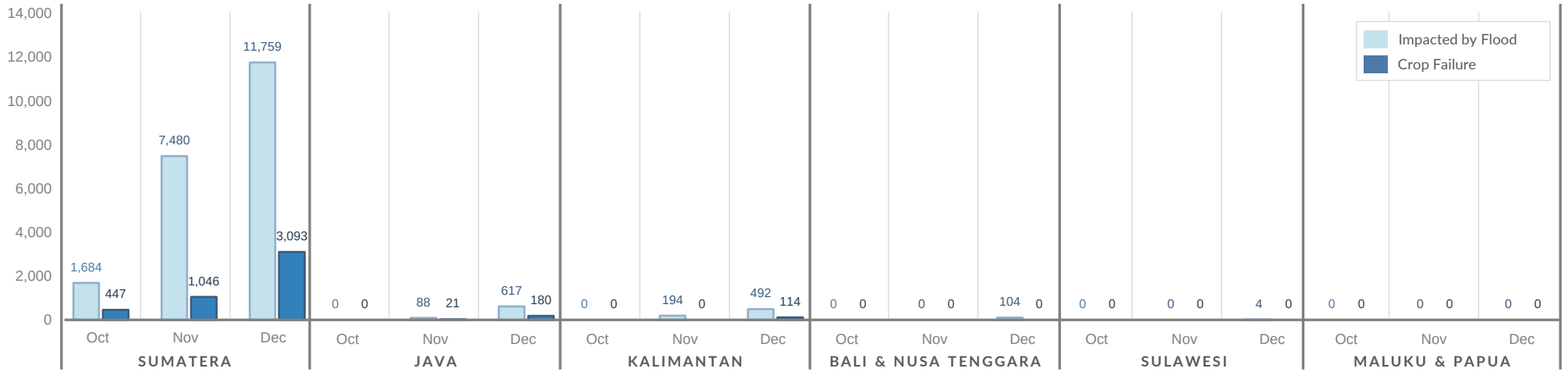


Disturbances to Paddy Crops: October - December 2023

Impacted paddy cultivation area by floods



Flood Impacted paddy cultivation area (hectare)



*Based on total paddy field area in *Lahan Baku Sawah* 2019

According to data from the Ministry of Agriculture, floods in several areas across Indonesia disrupted the growth of paddy crops in October – December 2023.

From October to December 2023, floods impacted a total of 22,420 hectares of paddy cultivation areas, resulting in 4,899 hectares of harvest failure, equivalent to 22% of the flood-impacted paddy cultivation areas.

Around 90% of the affected paddy fields were in Sumatra, resulting in harvest failures in 4,586 hectares of paddy cultivation areas.

Aceh suffered the most, with floods affecting more than 7500 hectares (4%)* of paddy fields in December 2023, leading to harvest failures covering more than 1800 hectares (1%)*.

CLIMATE FORECAST

ENSO OUTLOOK

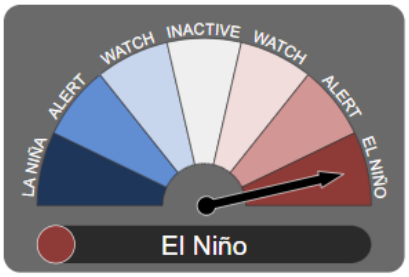
PEAK OF RAINY SEASON

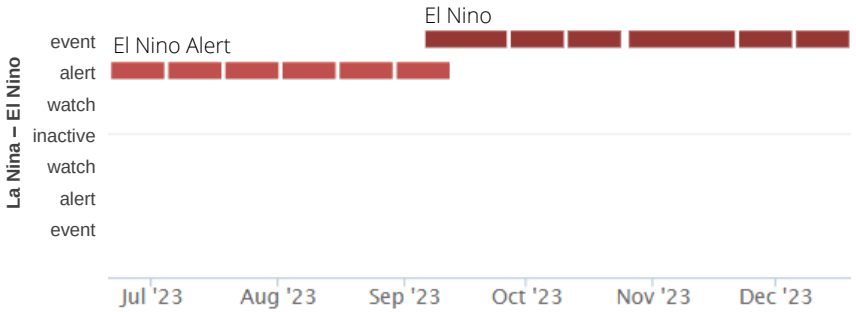
BMKG EARLY WARNING INFORMATION

BMKG RAINFALL FORECAST

CLIMATE OUTLOOK

ENSO Outlook: January 2024

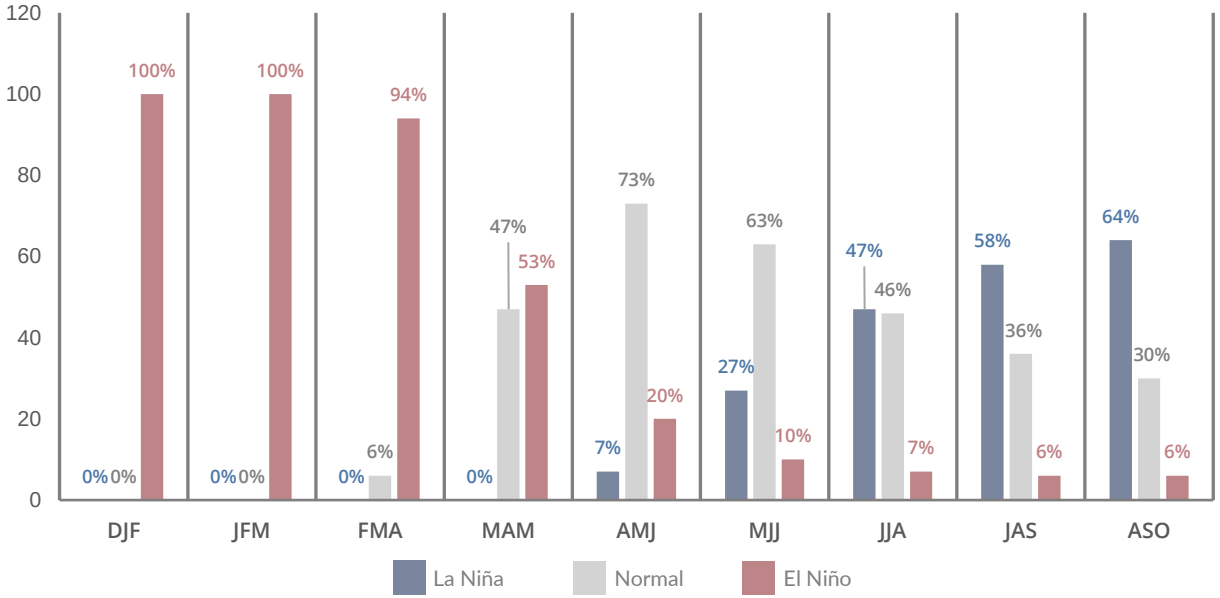


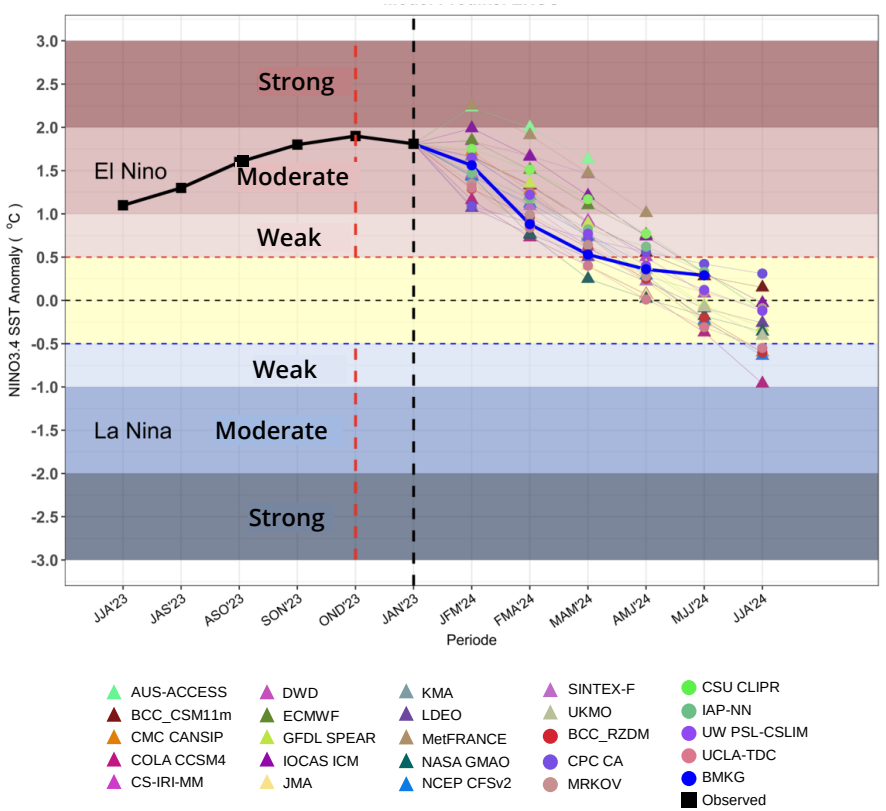


The El Niño–Southern Oscillation (ENSO) outlook issued in January 2024 suggests the continued presence of a moderate El Niño. This condition is expected to persist throughout the first quarter of 2024.

El Niño typically brings drier and warmer conditions to Indonesia, resulting in reduced rainfall and potential drought conditions. It is important to recognize that the El Niño impact on the amount and distribution of rainfall may vary across different provinces.

ENSO Probabilities (%)





BMKG ENSO & IOD Analysis: https://cdn.bmkg.go.id/web/02.-Dinamika-Atmosfer-Dasarian-II-Januari-2024.pdf
Historical ENSO Outlook: http://www.bom.gov.au/climate/enso/outlook/
ENSO Probabilities: https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_plume

Peak of Rainy Season

Peak of rainy season estimation across Indonesia

Sep – Dec 2023

Aceh
Most of North Sumatera
Riau & Riau Islands
West Sumatera
East of Jambi
Bengkulu
North of South Sumatera
Most of Bangka Belitung

Parts of Banten
Parts of Central Java

West Kalimantan
West & North of Central Kalimantan
Most of North Kalimantan
Parts of East Kalimantan
Parts of South Kalimantan

Parts of North Sulawesi
Most of Gorontalo
Parts of Central Sulawesi
Parts of West Sulawesi

Small parts of North Maluku
Small parts of Maluku

Parts of South-West Papua
Central Parts of West Papua
Parts of Central Papua
North Parts of Papua
Central Parts of South Papua

Jan – Feb 2024

West of Jambi
South of South Sumatera
South of Lampung

Most of Banten & DKI Jakarta
Most of West Java
Most of Central Java
DI Yogyakarta & East Java

Bali & NTT
Parts of NTB

South of East Kalimantan
East of Central Kalimantan
East & West of East Kalimantan
Most of South Kalimantan

Most of North Sulawesi
Most of Gorontalo
Parts of Central Sulawesi
Parts of West Sulawesi
Parts of South Sulawesi

Most of North Maluku
Parts of Maluku

Parts of South-West Papua
Parts of West Papua
Parts of Central Papua
Most of Papua
South of South Papua

Mar – Apr 2024

Parts of North Sumatera
Parts of South Sumatera
West & North of Lampung

Parts of West Java

Parts of NTB

Small parts of South Kalimantan
Parts of East Kalimantan

Parts of Central Sulawesi
Parts of West Sulawesi
Parts of South Sulawesi
Parts of South-West Sulawesi

Parts of Maluku

Papua Highlands

May - Jun 2024

Small parts of South Kalimantan

Small parts of North Sulawesi
Parts of Central Sulawesi
Parts of South Sulawesi
Parts of South-West Sulawesi

Parts of Maluku

Jul - Sep 2024

Parts of Central Sulawesi

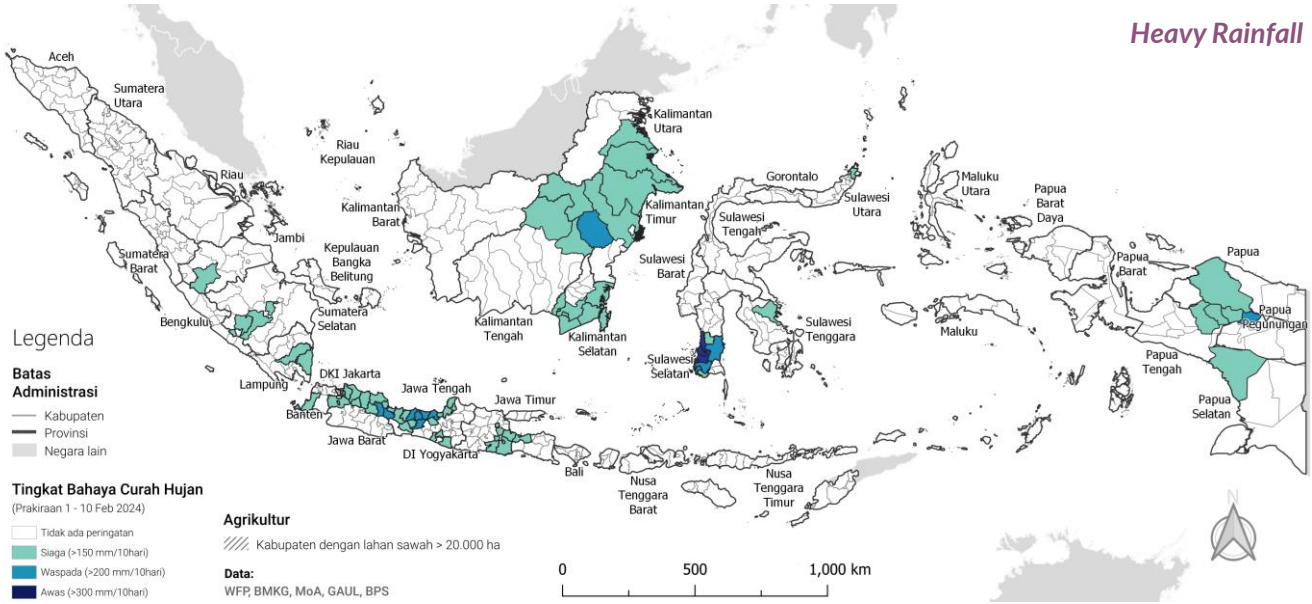
North & East of South-West Papua
North of West Papua

Data source: BMKG

BMKG Early Warning Information: February 2024

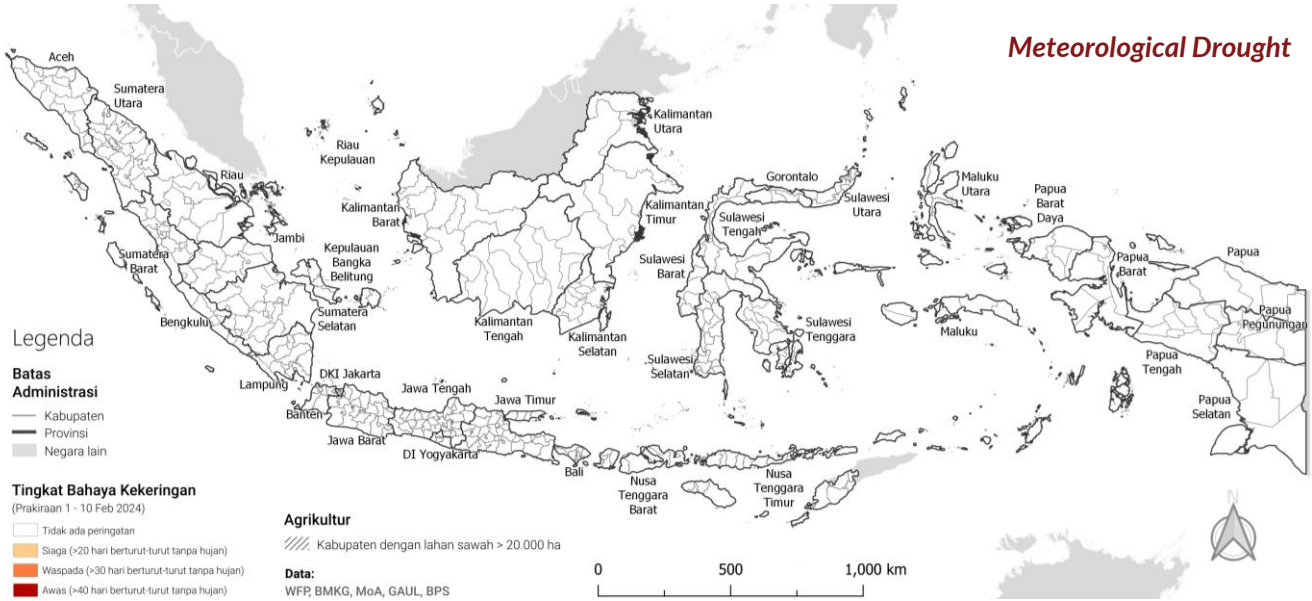
Early warning on meteorological heavy rainfall events and drought

Heavy Rainfall



Early warning information released by BMKG in late February 2024 indicates a risk of heavy rainfall that may occur in the island of Java, East Nusa Tenggara and Papua. Advisory level of heavy rainfall was released for areas in Jambi, Sumatera Selatan, Lampung, Central Java, East Java, East Nusa Tenggara, and some parts of Kalimantan, Sulawesi, and Papua. Meanwhile, Alert and Warning level of heavy rainfall were released for areas in Central Java, East Kalimantan, South Sulawesi, West Nusa Tenggara, and Papua Province.

Meteorological Drought

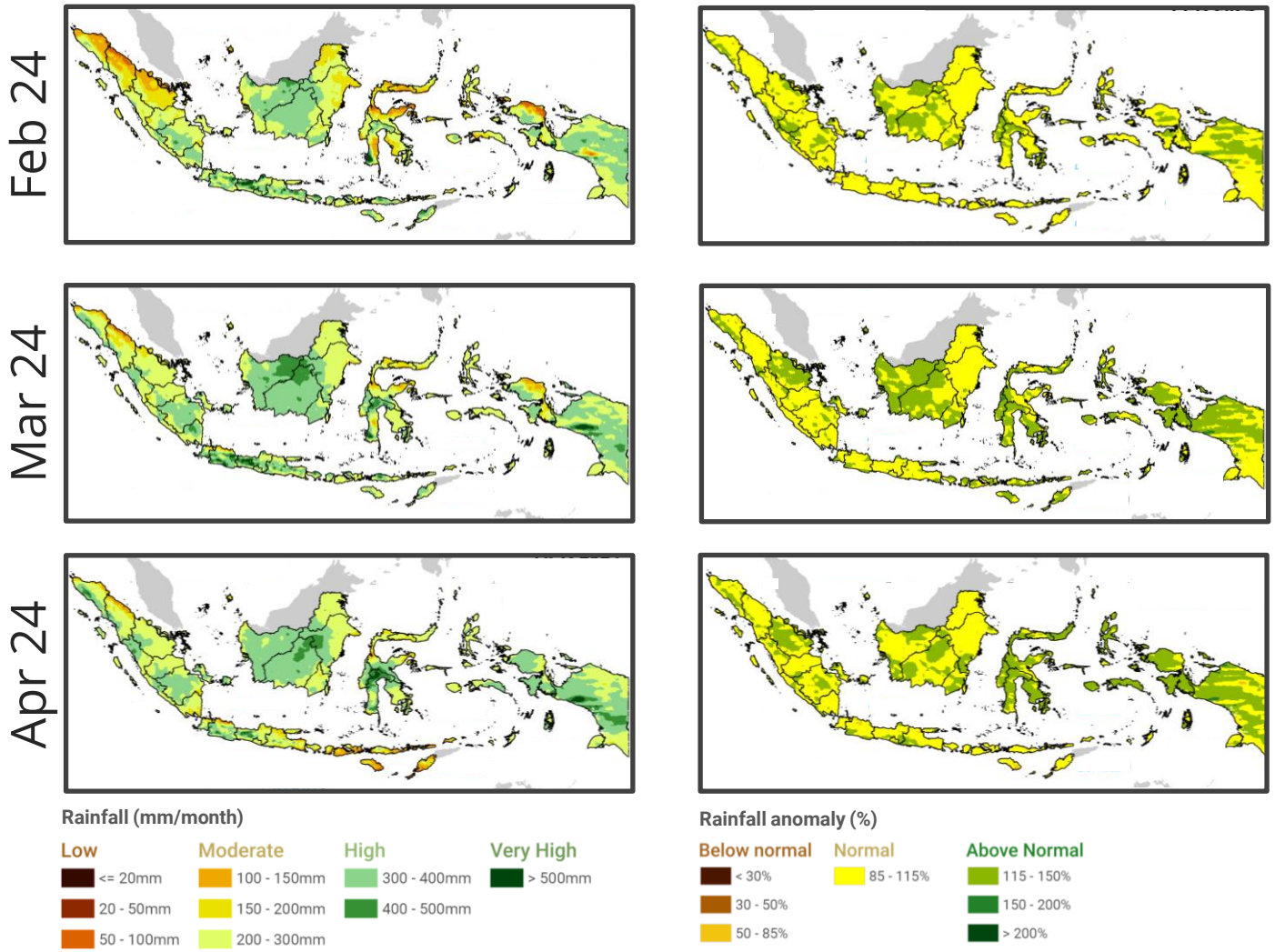


In its latest update, BMKG has not issued any early warnings for meteorological drought. This aligns with Indonesia entering the rainy season, characterized by frequent rainfall occurring in different areas of Indonesia which reduced the risk of meteorological drought.

BMKG Climate Early Warning System: https://cews.bmkg.go.id/

BMKG Rainfall Forecast: February – April 2024

Monthly rainfall accumulation and anomaly forecasts by BMKG



Forecast data source: https://www.bmkg.go.id/iklim/buletin-iklim.bmkg

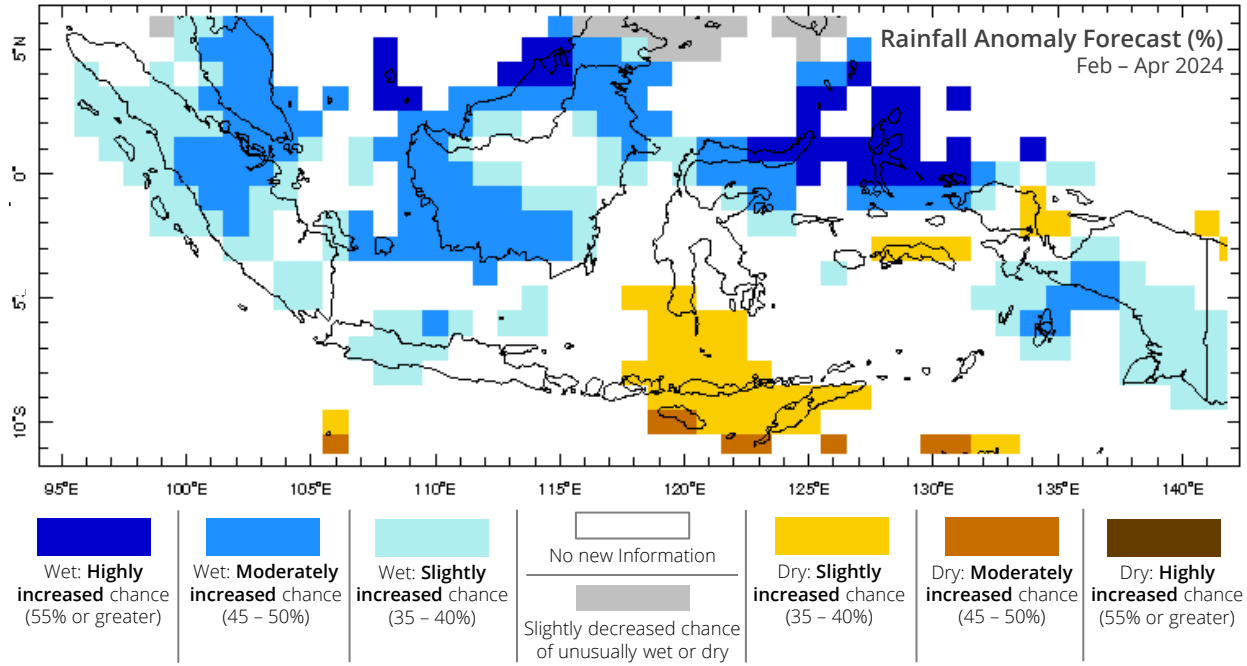
February 2024 - Indonesia's territory is forecasted to experience moderate to high-intensity rainfall across the country. Higher amount of rainfall are expected in the southern parts of Sumatera, Kalimantan, Java, and Papua. These precipitation patterns are within the normal range for this time of year.

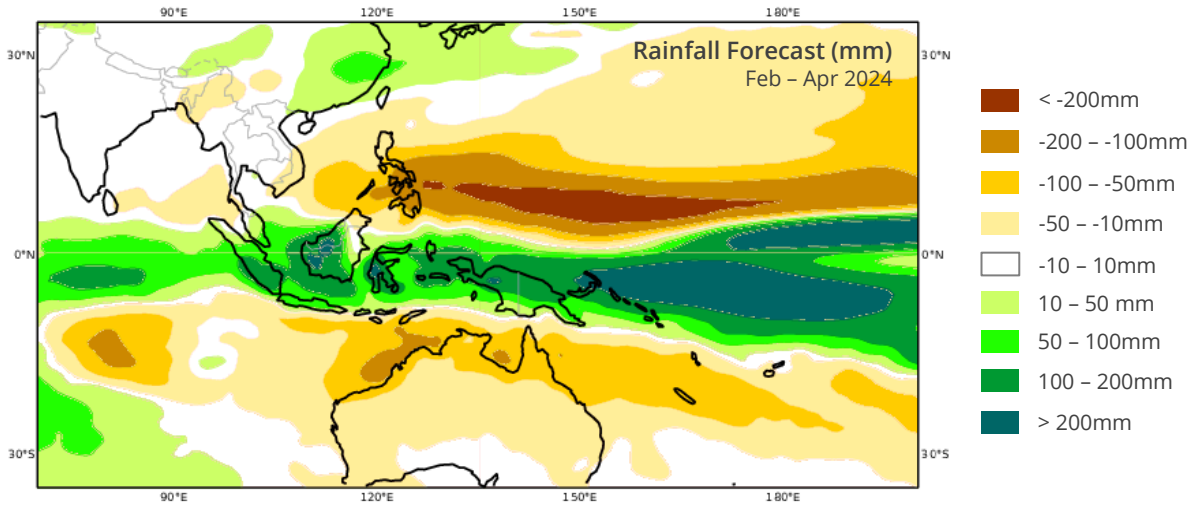
March 2024 - High amounts of rainfall are forecasted for Java Island, western part of Sulawesi, central part of Kalimantan, and Papua. Above-normal rainfall is expected in Sulawesi, Papua, the Nusa Tenggara Islands and several provinces in Sumatera and Kalimantan.

April 2024 - Rainfall with high intensity is anticipated across Indonesia, although the islands across The Nusa Tenggaras may experience comparatively lower amount of rainfall. Above-normal rainfall is expected in Sulawesi, Maluku, Papua, and certain parts of Sumatera and Kalimantan.

Climate Outlook: February – April 2024

Forecast of seasonal rainfall





The three-month seasonal rainfall anomaly forecast from IRI Columbia University (top) and ECMWF (bottom) indicates a high possibility of increased rainfall across Indonesia from February to April 2024.

Wet conditions are anticipated in various islands, including Sumatera, Kalimantan, Java, Sulawesi, and Papua, with above-normal rainfall expected. On the other hand, dry conditions may prevail in parts of Maluku, Papua, and Nusa Tenggara Islands.

Normal rainfall is anticipated in some parts of Aceh, South Sumatera, Banten, D.K.I Jakarta, Central Java, D.I Yogyakarta, Bali, West Nusa Tenggara, Central Kalimantan, East Kalimantan, West Sulawesi, Central Sulawesi, Southeast Sulawesi, Papua, and Papua Highlands.

The seasonal forecasts provide an indication of likelihood of rainfall amounts/anomaly over the next three months. However, they do not indicate any individual extreme rainfall events, for which weather forecasting products to be referred.

IRI: http://iridl.ldeo.columbia.edu/maproom/IFRC/FIC/prcp_fcst.html?bbox=bb%3A94.584%3A-11.255%3A141.811%3A6.308%3Abb
ECMWF: https://climate.copernicus.eu/charts/packages/c3s_seasonal/products/c3s_seasonal_spatial_mm_rain_3m?area=area12&base_time=202401010000&type=ensm&valid_time=202402010000

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