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INDONESIA

Impact Monitoring of Hydrometeorological Hazards

April - June (Q2) 2022



August 2022

A Joint Bulletin by:



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Key Messages

Climate Situation - Q2 2022: From April to June, due to the persisting La Niña phenomenon, rainfall across Indonesia was higher than the thirty-year long-term average. Most districts within the Sumatera, Jawa, Kalimantan, and Bali experienced an increase in rainfall. On the contrary, some districts in Aceh, Kalimantan Barat, Kalimantan Selatan, Kalimantan Timur, Sulawesi Tengah, Maluku, Nusa Tenggara Timur, Papua, and Papua Barat experienced less rainfall indicating drier conditions compared to the long-term average.

Impact of Climate and Hydrometeorological Disasters on Agriculture: Extreme rainfall between April and June 2022 caused floods in several regions. This resulted in damaging chilli and shallot plants and disrupting the production of these commodities, leading to shortages in local markets. The Ministry of Agriculture also reported that floods and droughts impacted paddy fields between April and May in Sumatera, Jawa, Kalimantan, and Sulawesi. However, these events did not have significant influence on the price of unhusked rice and rice, which remained relatively stable during the observed period.

Impact of Disasters - Q2 2022: The National Disaster Management Agency reported at least 784 disasters occurred between April and June 2022. More than 90% were caused by hydrometeorological hazards including floods, extreme weather (e. g. storms, cyclone) and landslides. Half of the total disasters took place in Jawa Barat, Jawa Tengah, and Jawa Timur. However, damage caused by disasters was considerably less than the same period last year when the Seroja cyclone impacted Nusa Tenggara Timur.

Status of Food and Nutrition Security: The National Food Agency has reported that most provinces in Indonesia were food secure in June 2022. Twenty-seven provinces were found to be relatively stable, while 6 provinces were under watch for possible degradation of food and nutrition security. These include Riau, Sumatera Barat, Bali, Nusa Tenggara Barat, Sulawesi Barat, and Maluku. Only Nusa Tenggara Timur was considered vulnerable to food and nutrition insecurity.

Food Commodity Prices: Between April and June 2022, out of the 10 strategic food commodities, the prices of shallots and chillies saw the sharpest increase, rising by more than 70% and 50% respectively. The price fluctuation of these food commodities were heavily influenced by high rainfall intensity and extreme weather events, which led to crop failures and shortages of supply. The prices of egg and wheat flour also increased, but remaining below 15%.

Climate Outlook – Aug to Oct 2022: The La Niña phenomenon is still ongoing and forecasted to continue although with a weaker effect until the end of the year. Most areas across Indonesia are expected to experience increased rainfall above the thirty-year long-term average. Increased rainfall is expected in Kalimantan, Jawa, Sulawesi, Nusa Tenggara, the southern part of Sumatera and Papua. However, at the same time, it is also predicted that there will be less precipitation in Sabu Raijua and Sumba Timur districts in Nusa Tenggara Timur and the northern part of Papua.

Media Reports

Bird's eye chilli and shallot were the cause of inflation in June 2022



(01/07/2022) LIPUTAN6.COM - Statistics Indonesia (BPS) stated that in June 2022, the month-on-month inflation was 0.61 percent. The inflation was significantly influenced by the price of chillies and shallots.

When calculated on an annual basis (YoY), inflation in June 2022 reached 4.35 percent. Again, the volatility of prices was the biggest contributor to this increase. [1].

Weather triggers crop failures for chilli farmers



(14/06/2022) ANTARANEWS.COM - The Surakarta City Trade Office stated that the recent increase in chilli prices was influenced by the weather, which resulted in crop failures in a number of areas.

The Head of the Surakarta City Trade Office, Heru Sunardi, said that the dry season should be coming, but the rain intensity is still high, which damaged chilli plants and caused harvest failures [2].

Weather anomaly, shallot prices soar



(04/07/2022) GATRA.COM - The price of shallots soared above the highest retail price (HET). The decreased supply from farmers due to weather anomalies is the main trigger for price increases.

According to data from the Information System of Price Commodity and Production of the Central Java Regional Inflation Control Team, the price of shallots ranges from IDR 48,000 to IDR 60,000 per kilogram. Meanwhile, the reference price of shallots set by the Government through the Ministry of Trade's Regulation Number 07 of 2020 is IDR 32,000 per kilogram.

The spike in prices of food commodities was due to reduced supplies from farmers in shallot-producing areas. One of them is Brebes Regency, Central Java [4].

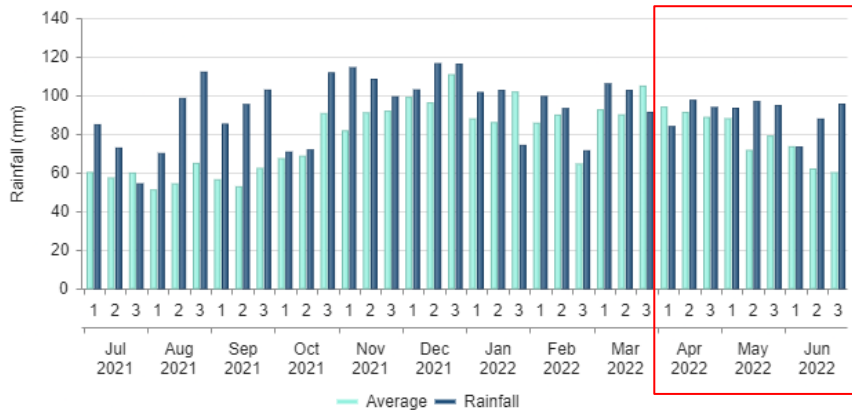
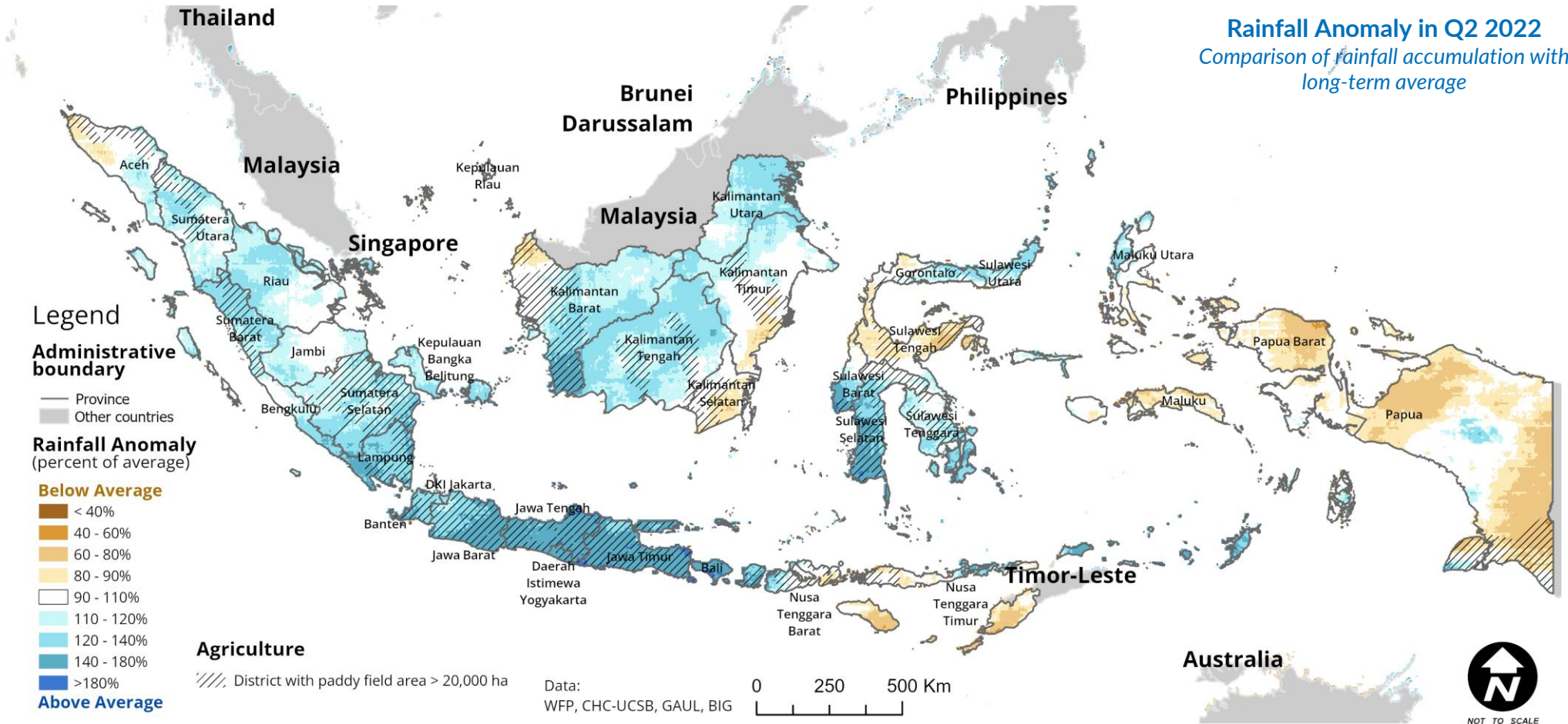
La Niña is strengthening again

(30/05/2022) KOMPAS.ID - The La Niña phenomenon has been ongoing for the last two years. Although it was found to have weakened in January 2022, latest meteorological reports indicate that it is strengthening again. This condition could have an impact on increasing rainfall in parts of Indonesia as well as delaying the dry season more than what was previously predicted.

"Long-term climate forecast models from several international climate assessment institutions indicate the possibility that La Niña could continue until the end of the year. This can make it three years in a row," said Climate Researcher and Sub-Coordinator for the Production of Climate Information and Air Quality of the Meteorological, Climatological and Geophysical Agency (BMKG), Siswanto, in Jakarta, on Sunday (29/5/2022) [3].

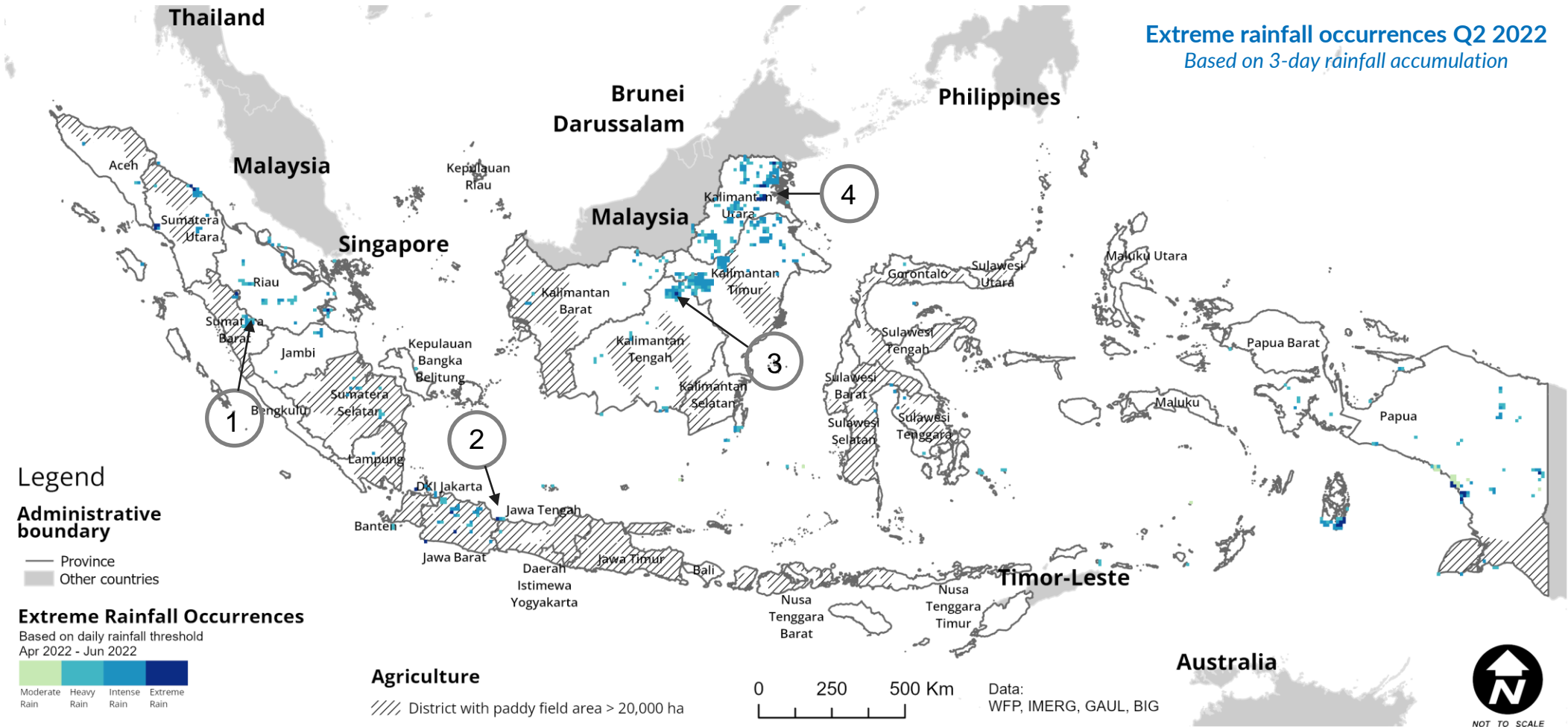
Rainfall Anomaly: April – June 2022

Rainfall Anomaly in Q2 2022
Comparison of rainfall accumulation with long-term average



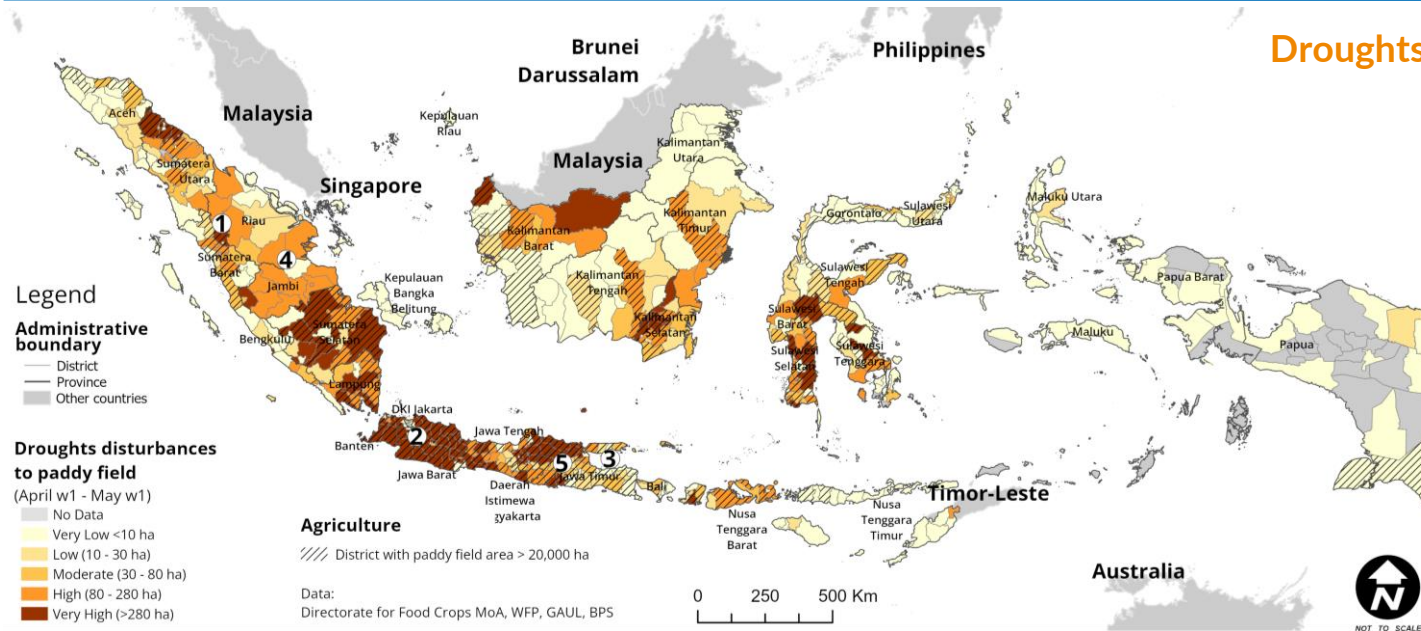
From April to June 2022, rainfall across Indonesia was higher than the long-term average (30 years) especially during the second and third week of June. Most areas in Sumatera, Jawa, Kalimantan, Sulawesi and Bali experienced rainfall above normal condition due to the persisting La Niña phenomenon. On the contrary, some districts in Aceh, Kalimantan Barat, Kalimantan Selatan, Kalimantan Timur, Sulawesi Tengah, Maluku, Nusa Tenggara Timur, Papua, and Papua Barat experienced below average rainfall resulting in drier conditions compared to the long-term average.

Extreme Rainfall Occurrences: April – June 2022



Extreme rainfall was detected in some areas of Kalimantan Tengah, Kalimantan Timur and Kalimantan Utara. The occurrence of these events are associated with the La Niña phenomenon, which caused higher than normal rainfall. As indicated by circles on the map, the incidence of localised extreme rainfall caused floods in Solok (1), Brebes (2), Murung Raya (3), Nunukan and Malinau (4). Floods led to crop failures in Solok and Brebes, which caused supply shortages of chillies and shallots.

Paddy Disturbances by Floods and Droughts: April-May 2022

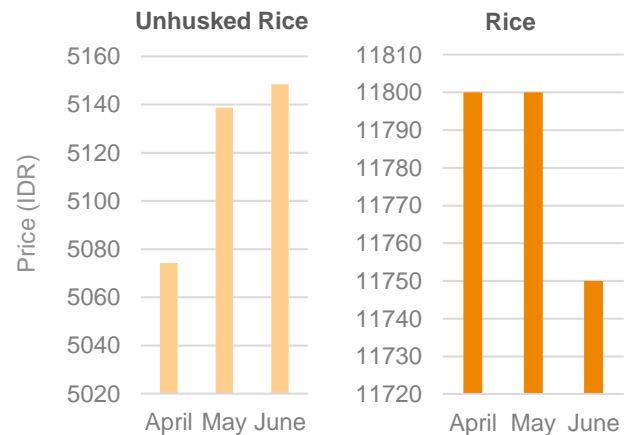
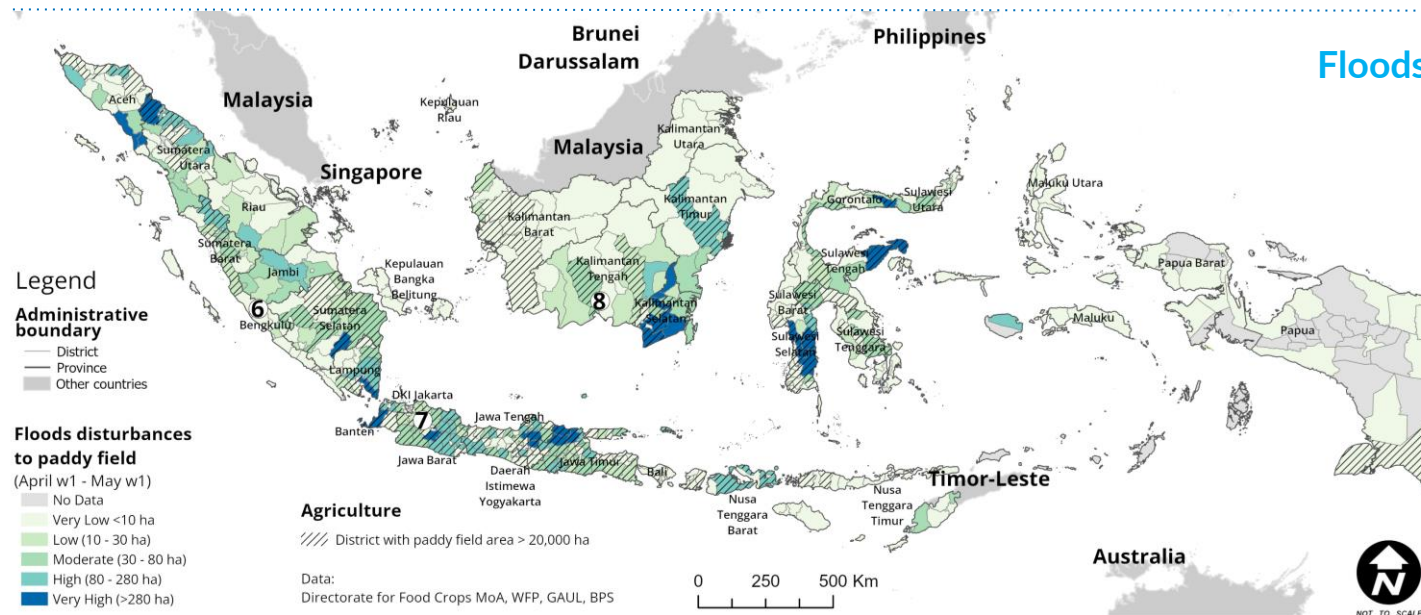


From April to May 2022, as reported by the Ministry of Agriculture, floods and droughts caused disturbances to paddy crops in several areas in Indonesia.










Several factors contributed to exacerbating the effects of drought on paddy fields, including damaged or disruption of irrigation channels in Tanah Datar [1], Bandung Barat [2], and Panarukan [3], reduced water sources due to the long dry season in Batanghari [4], and inefficient use of irrigation water in Kota Batu [5].

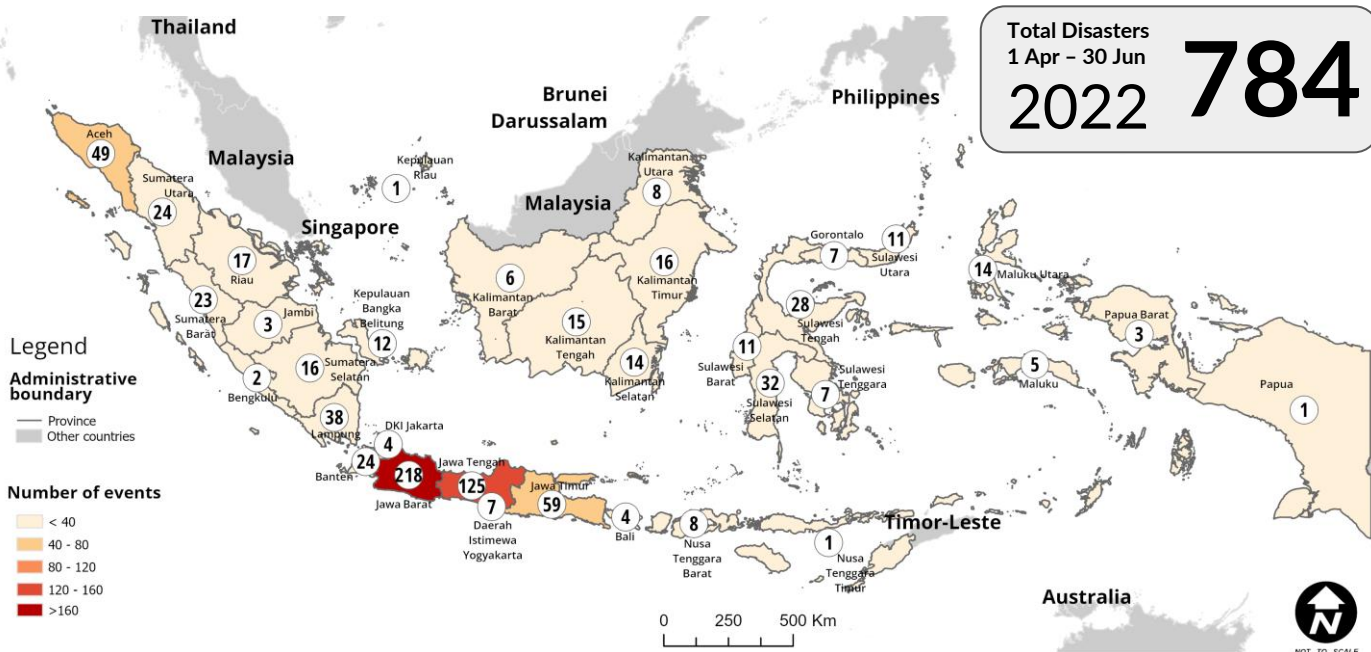
Floods caused by extreme rainfall and affecting paddy fields occurred in Bengkulu [7], Cianjur [6], and Kalimantan Tengah [8].

Despite these disturbances in several areas, the prices of unhusked rice and rice from April to June were relatively stable. The price of unhusked rice increased by about 1.5%, while the price of rice decreased by 0.5%.



Impact of Disasters in Indonesia: April – June 2022

	2022 Apr-Jun	2021 Apr-Jun	
 Flood	294	189	+53.1%
 Extreme weather	282	172	+63.9%
 Landslide	165	104	+58.6%
 Land & forest fire	35	33	+6%
 Earthquake	4	4	0%
 Tidalwave & abrasion	3	9	-66.7%
 Drought	1	1	0%
Disaster Impact			
 Impacted population	741 thousand	1.1 million	-32.6%
 Damaged house	4,633	72,337	-93.6%

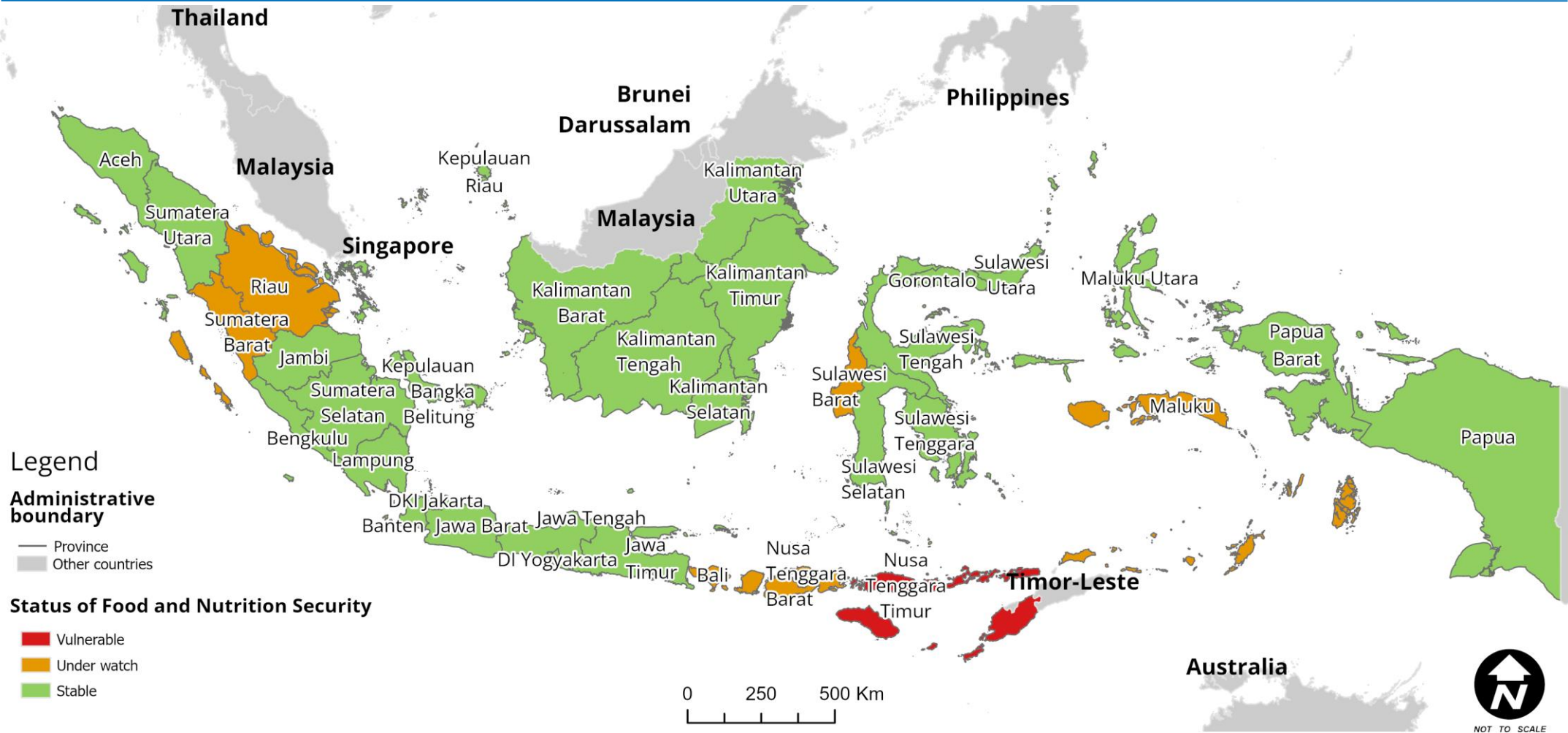


Total Disasters
1 Apr – 30 Jun
2022 784

The National Disaster Management Agency reported the occurrence of at least 784 disasters between Apr-Jun 2022, which is a 53% increase compared to the same period in 2021 (512 disasters). A number of hydrometeorological disasters like floods, extreme weather (e.g. storms and cyclones) and landslides increased more than 50%, representing 94.5% of the total disasters in the observed period. The majority of disasters happened in Jawa Barat, Jawa Tengah, and Jawa Timur with a total of 402 disasters combined.

Despite the increasing number of disasters, casualty losses caused by disasters decreased around 30% compared to Apr-Jun 2021. It was reported that 21 people died, 5 people went missing, 83 people were physically injured, and 741 thousand people were impacted by disasters and consequently were displaced. The total damage to houses and public facilities were significantly lower compared to the same period last year when Nusa Tenggara Timur was heavily impacted by the severe Seroja Cyclone.

Status of Food and Nutrition Security : June 2022



According to the latest analysis of the Food and Nutrition Surveillance System (SKPG), the National Food Agency has reported that most provinces in Indonesia were food secure in June 2022. Twenty-seven provinces were found to be relatively stable, while 6 provinces were under watch for possible degradation of food and nutrition security. These include Riau, Sumatera Barat, Bali, Nusa Tenggara Barat, Sulawesi Barat, and Maluku. Only Nusa Tenggara Timur was considered vulnerable to food and nutrition insecurity.

On a monthly basis, the NFA through SKPG monitors the food and nutrition status of provinces by using several indicators including planted areas and crop failures, average prices of food commodities, changes in the weight of children under five and presence of malnutrition cases.¹⁰

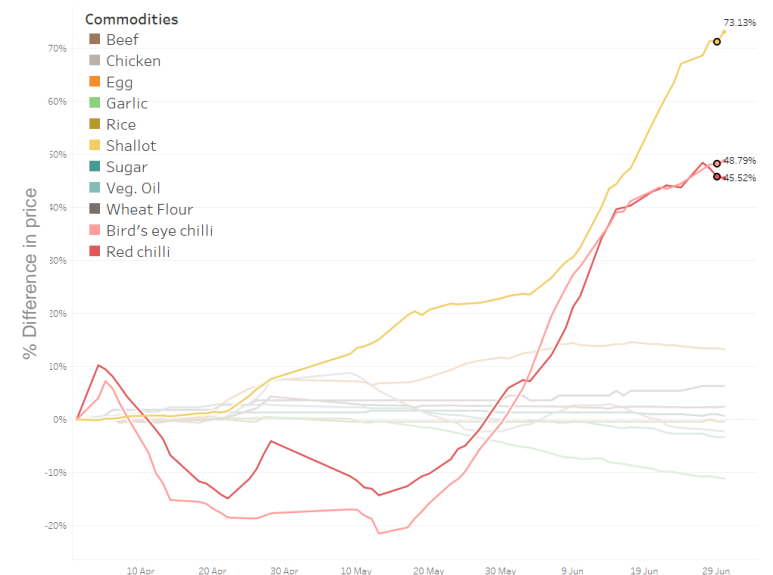
Food Commodity Prices: April - June 2022

According to the National Strategic Food Price Information Centre (PIHPSN) of Bank Indonesia, the prices of red chilli, bird's eye chilli and shallot experienced a sharp increase from April to June. Over this three-month period, the price of shallots increased by more than 70%, while the price of red chilli and bird's eye chilli increased by almost 50%.

The price fluctuation of these food commodities were first influenced by Eid al-Fitr celebrations, followed by the wet season, where high rainfall intensity and extreme weather caused damage to crops and led to harvest failures. As a result, the prices of red chilli, bird's eye chilli and shallot soared since there were limited supplies to accommodate the market's demand.

The prices of egg and wheat flour also experienced an increase between April and June, but still below 15%. Meanwhile, other food commodities such as beef, sugar, rice, chicken and vegetable oil were relatively stable. In comparison with other food commodities, only the price of garlic decreased (around 10%) during the same period.

National Food Commodities Price Trend

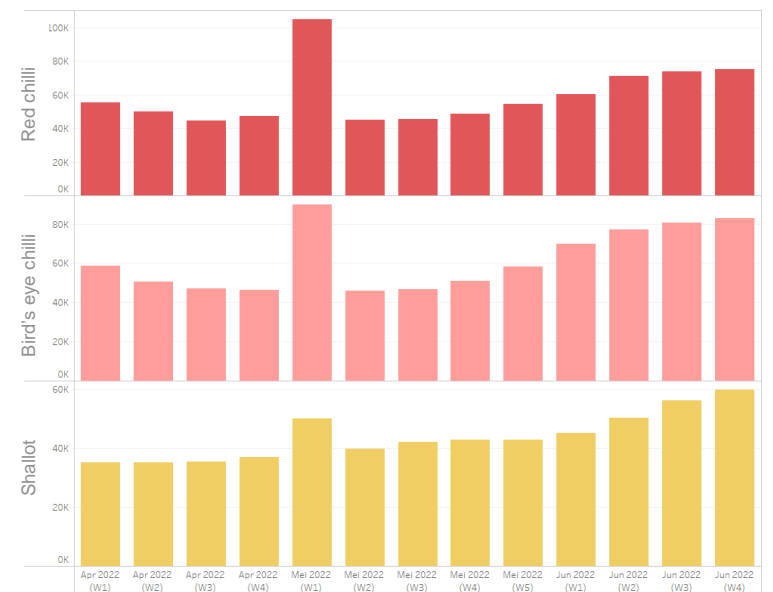


The price of chilli was the most volatile compared to other food commodities mainly due to lower supplies caused by crop failures. From Apr to Jun, the weekly average prices of red chilli and bird's eye chilli were IDR 59,654/kg and IDR 61,600/kg, respectively. In Apr, the prices of both food commodities decreased, but spiked during the first week of May because of high demand for Eid al-Fitr. Starting in the third week of May, the prices continued to increase until the end of Jun, reaching IDR 76,150/kg for red chilli and IDR 83,250/kg for bird's eye chilli.

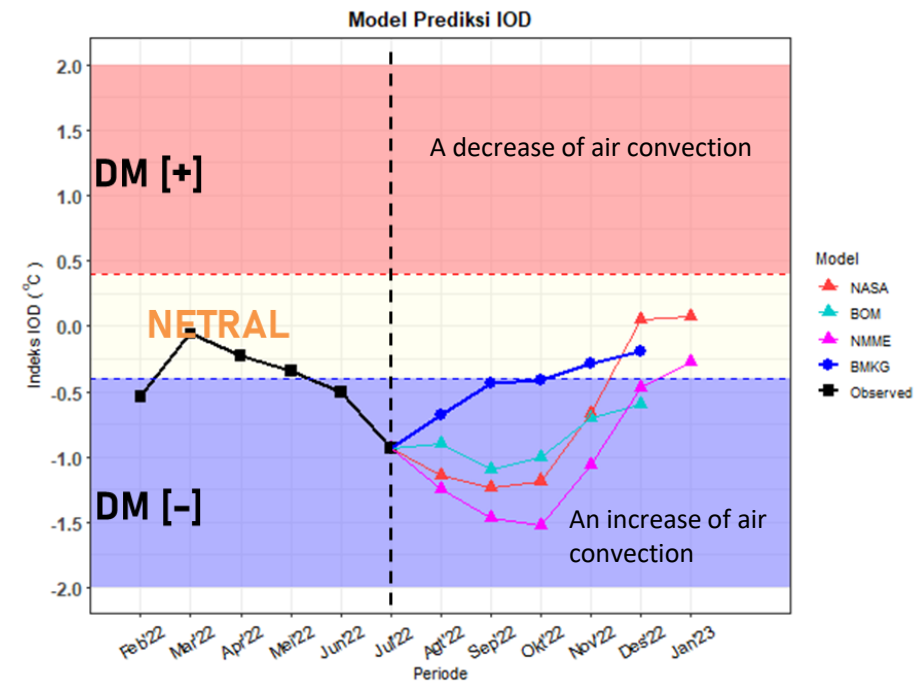
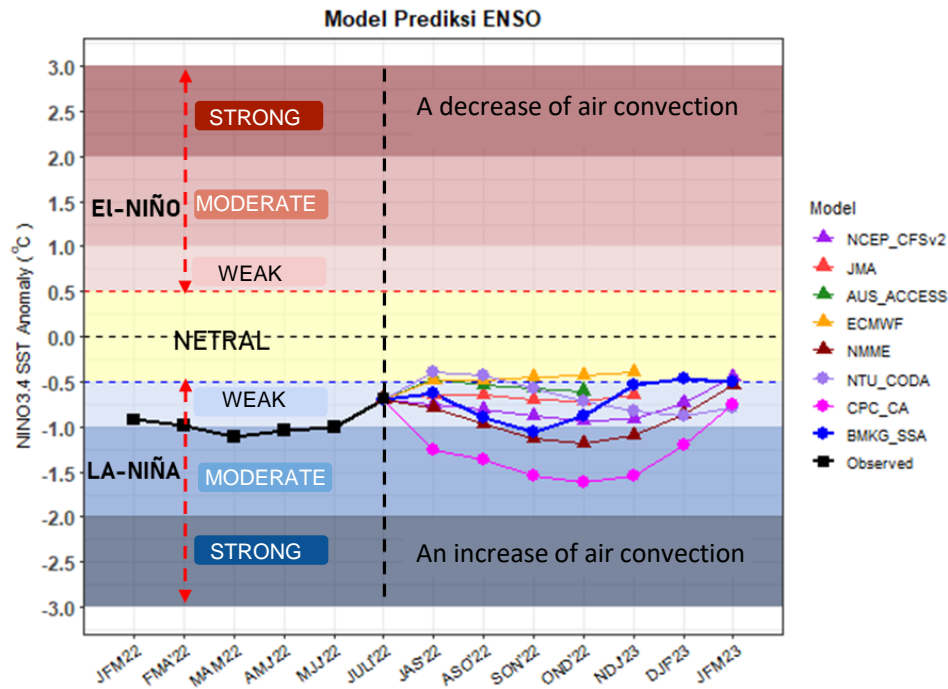


Excessive rainfall contributed to harvest failures, which caused the market supply of shallots to decrease and affected the price due to scarcity. The price of shallots gradually increased from Apr to Jun 2022 with the weekly average price of IDR 43,873/kg. Similar to chilli, the price of shallots spiked in the third week of May due to Eid al-Fitr. Starting in the third week of May, the prices continued to rise reaching a 40% increase with the highest daily price recorded at IDR 60,250/kg in late Jun.

National Weekly Food Commodities Price Trend



ENSO and IOD Outlook: July 2022



Monthly ENSO Outlook Values

As of July 2022, La Niña still remains in Indonesia. Although some effects are persisting, a relatively weaker intensity is expected in the coming months.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2020													INACTIVE
2021													La Niña WATCH
2022													La Niña ALERT
													LA NIÑA

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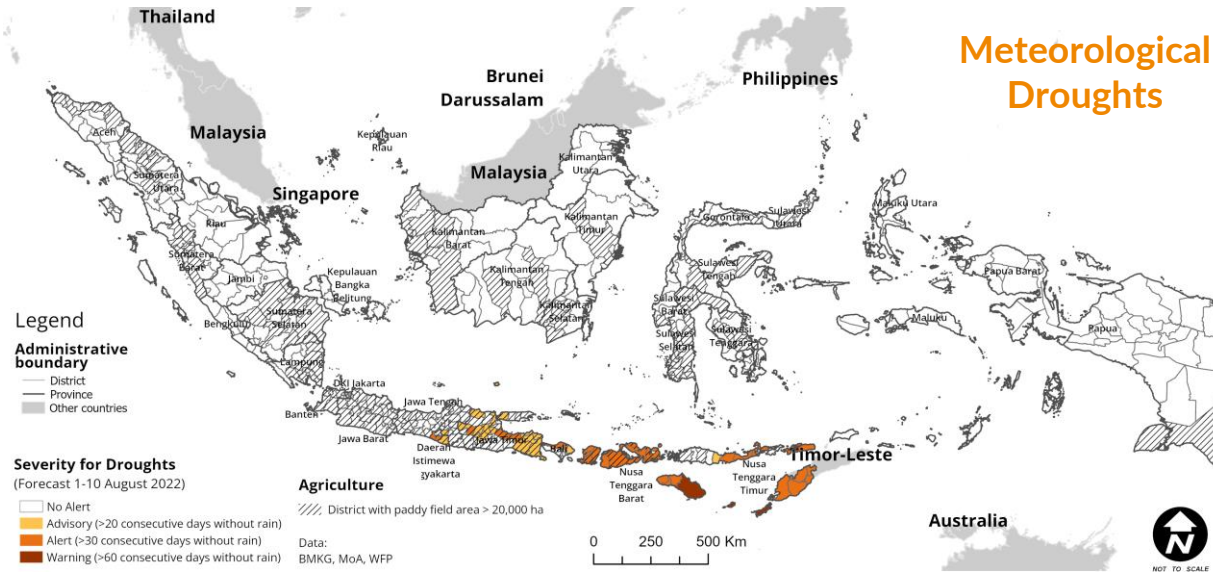
ENSO and IOD Analysis

The rainfall variability in Indonesia is generally influenced by El Niño–Southern Oscillation (ENSO) and Indian Ocean Dipole (IOD). Both phenomena contribute to an increase in convective activity, which causes more air to flow from the Pacific Ocean and Indian Ocean towards Indonesia. Consequently, it often causes heavy rains and increases the potential of floods. Atmospheric and oceanic indicators suggest ongoing La Niña.

The ENSO index is used to identify La Niña or El Niño as well as the rainfall patterns associated with these climate phenomena. The historical ENSO observation shows that La Niña has continued to prevail for three consecutive years since 2020, which is quite rare. Such long-lasting La Niña phenomena only occurred two previous times in Indonesia’s history, from 1973-1975 and from 1998-2000. Based on the latest oceanic observation, the ENSO and IOD show negative values of -0.69 and -0.93 in Jul 2022 which indicates a persisting (although weak) La Niña phenomenon in Indonesia.

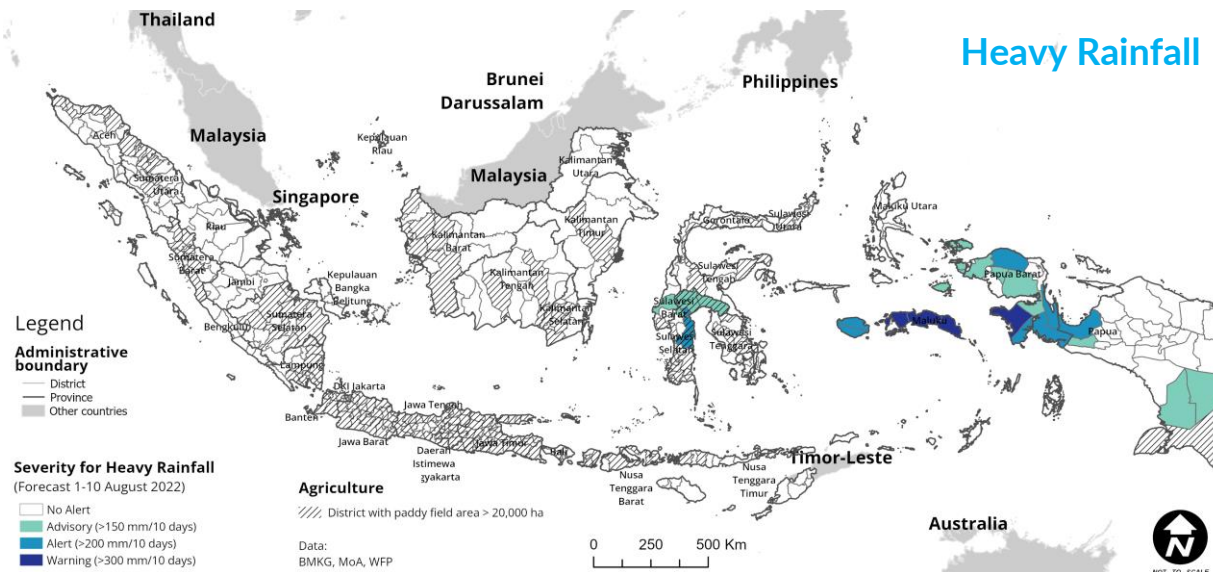
BMKG predicts that the ENSO and IOD indexes will gradually move to neutral, which indicates that the effects of La Niña will be weaker in the coming months. In other words, this suggests that there will be less rainfall occurrence in Indonesia. However, several other models also suggest that La Niña will be in moderate to neutral phase until the end of 2022.

Early Warning: Heavy Rainfall and Meteorological Drought - August 2022



Based on BMKG's early warning data as of 31 July 2022, there are indications of potential meteorological drought and heavy rainfall in several districts in Indonesia during the first 10 days of August. Despite the ongoing La Nina phenomenon, BMKG reported that 73% of Indonesia's territory has entered the dry season.

Meteorological drought can cause a reduction of water supplies for agricultural and household needs. From the observation of consecutive days without rain and low chance of rain (<20mm/day), drought is expected to continue during the first ten days of August in several districts within the provinces of Jawa Tengah, Yogyakarta, Jawa Timur, Bali, Nusa Tenggara Barat and Nusa Tenggara Timur. As of 31 July, several districts including Lombok Timur (Nusa Tenggara Barat) Kupang and Rotendau (Nusa Tenggara Timur) did not experience rain for at least 31 consecutive days, while Sabu Raijua and Sumba Timur in Nusa Tenggara Timur did not experience rain for at least 61 consecutive days.

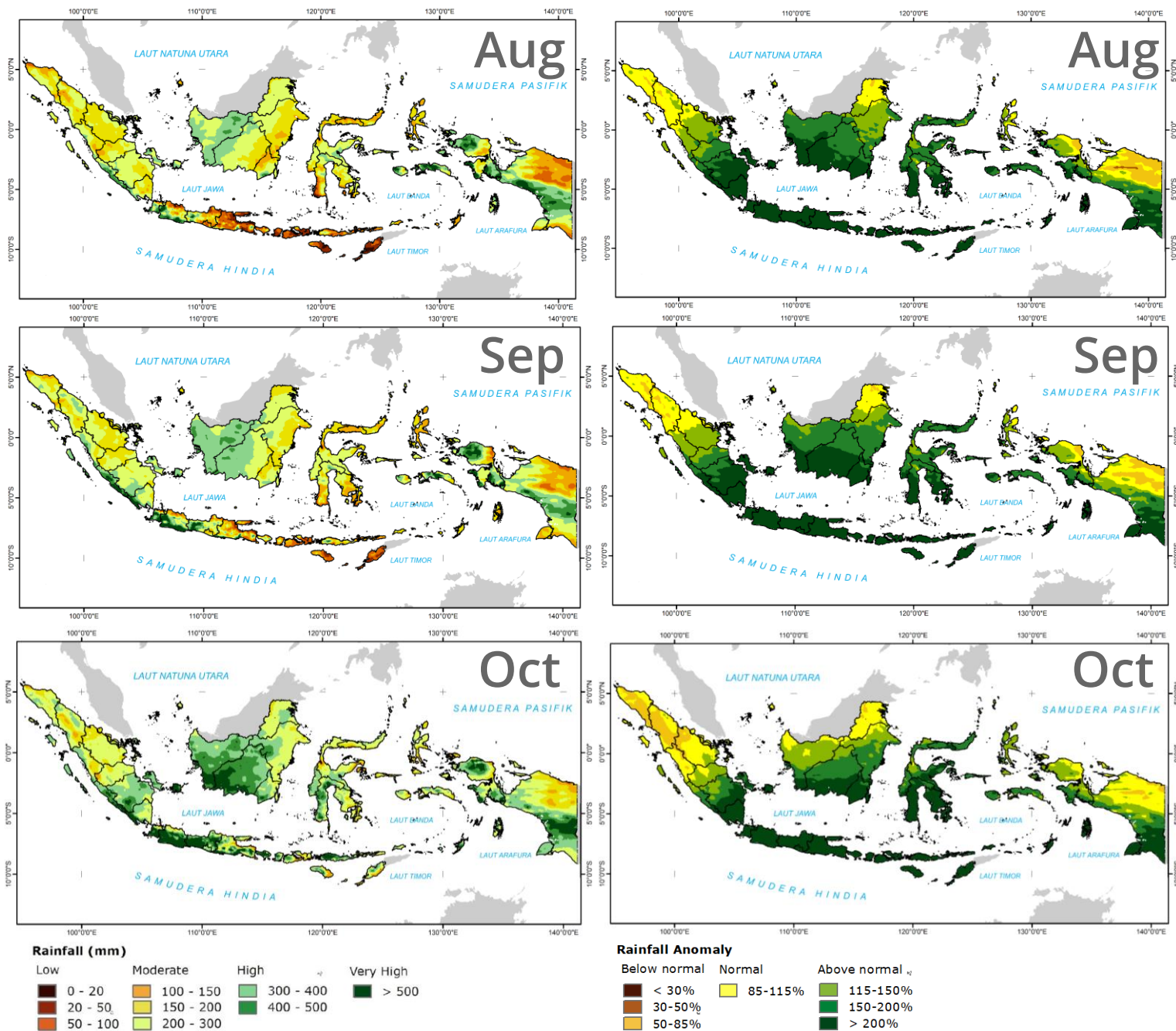


Extreme weather accompanied by heavy rainfall can increase the chance of floods and landslides. The probability of heavy rainfall (>200mm/10 days) is predicted during the first ten days of August in several districts in the provinces of Sulawesi Selatan, Maluku, Papua Barat and Papua. Thus, it is critical to increase awareness in districts that could be potentially affected, namely: Bone and Wajo (Sulawesi Selatan), (Maluku), Fak-Fak and Kaimana (Papua Barat), Deiyai, Dogiyai, Mimika (Papua), Buru, Seram Barat, Buru Selatan, Kota Ambon and Maluku Tengah (Maluku).

Notes for maps:

The severity is the combination of monitoring climate variability data and the forecast for the first 10 days of August.

Climate Outlook Aug - Oct 2022: BMKG Rainfall Forecast



Based on BMKG forecasts, the total monthly precipitation in Indonesia will gradually increase during the period Aug-Oct 2022 due to the persisting effect of La Niña. Although it is considered weaker, it is still influencing the amount of rainfall which is expected to be above normal condition during this period.

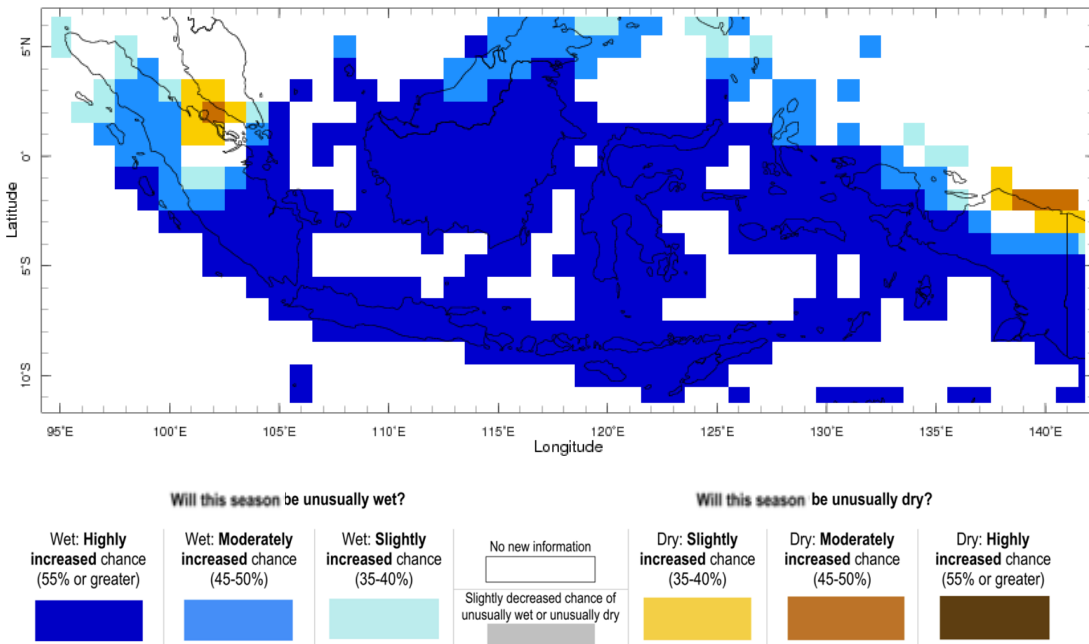
In Aug, areas in Nusa Tenggara, Sumatera, Kalimantan, Sulawesi, the eastern part of Jawa, and the northern part of Papua are expected to face low to moderate rainfall. Meanwhile, Kalimantan Barat, Papua Barat, Maluku Selatan and the southern part of Papua are expected to have high precipitation above the range of normal rainfall anomaly.

In Sep, low rainfall is predicted to continue in Nusa Tenggara, some areas in Sulawesi, and northern parts of Papua and Maluku. Rainfall above normal condition is expected across Indonesia except in Aceh, Sumatera Utara, Kalimantan Utara, and the southern part of Papua.

In Oct, increasing rainfall is expected to occur in Jawa, Kalimantan, and southern areas of Sumatera, Sulawesi, and Papua. However, rainfall below normal condition are predicted in Aceh, Sumatera Utara, and parts of Riau.

Climate Outlook Aug - Oct 2022: Indonesia in Global Rainfall Forecast

Forecast for Aug-Oct 2022, Forecast Issued Jul 2022

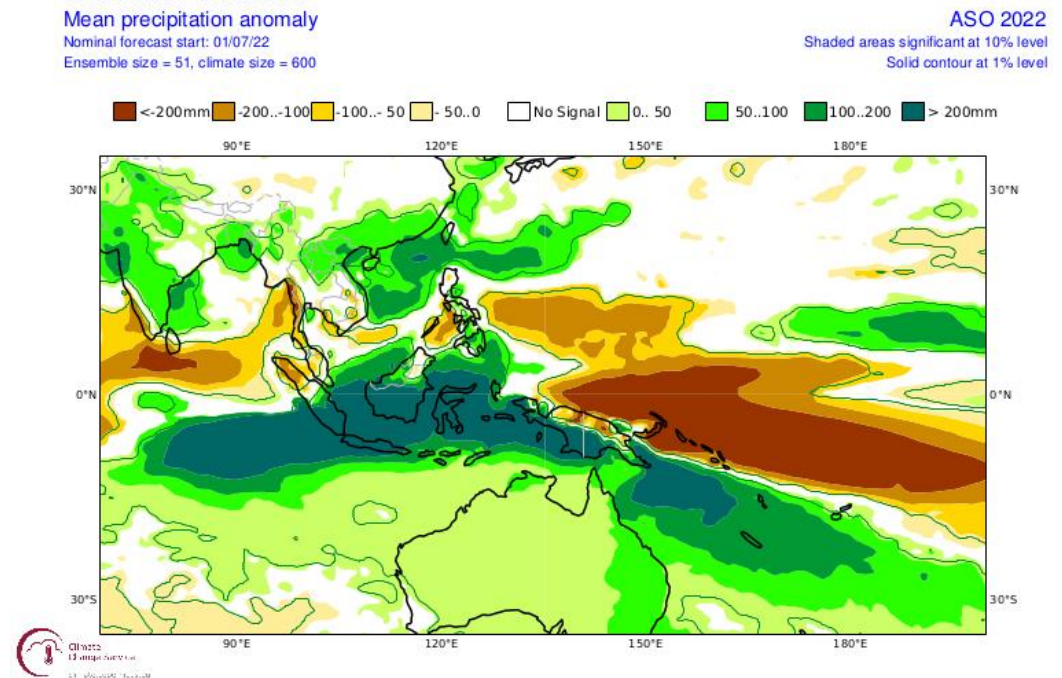


IRI Columbia University and ECMWF show a similar precipitation forecast for the period of Aug - Oct 2022.

Most areas in Indonesia are expected to have increasing rainfall during this three-month period. The island of Kalimantan, Jawa, Sulawesi, Nusa Tenggara and most areas in Sumatera and Papua face a high chance of increased precipitation. On the other hand, there might be a slight change of rainfall pattern and less precipitation surrounding Riau and the northern part of Papua.

These forecasts show the probability of accumulated rainfall over the next three months, either situated above or below normal conditions compared to the long-term average. It does not indicate chances of individual heavy rainfall events and should not be used to forecast local conditions or floods.

C3S: ECMWF contribution
Mean precipitation anomaly
Nominal forecast start: 01/07/22
Ensemble size = 51, climate size = 600



Left: IRI Columbia University seasonal forecast for Aug - Oct 2022 indicates a probability of total precipitation within the next three months to be unusually high or low:

http://iridl.ldeo.columbia.edu/maproom/IFRC/FIC/prcp_fcst.html?bbox=b%3A94.584%3A-11.255%3A141.811%3A6.308%3Abb

Right: ECMWF three-month seasonal forecast for Aug - Oct 2022 where green, white, and brown shades indicate wet, normal, and dry condition, respectively:

https://climate.copernicus.eu/charts/c3s_seasonal/c3s_seasonal_spatial_emf_rain_3m?facets=Parameters,precipitation&time=2022070100,744,2022080100&type=enm&area=area12



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