Asia: Monthly Climate Outlook December to September

Issued: March 2021

Overview

Asia Current Status and Outlook – Temperature

Asia Current Status and Outlook – Rainfall

Global Outlook – Temperature

Global Outlook – Rainfall

Asia Current Status and Outlook - Temperature

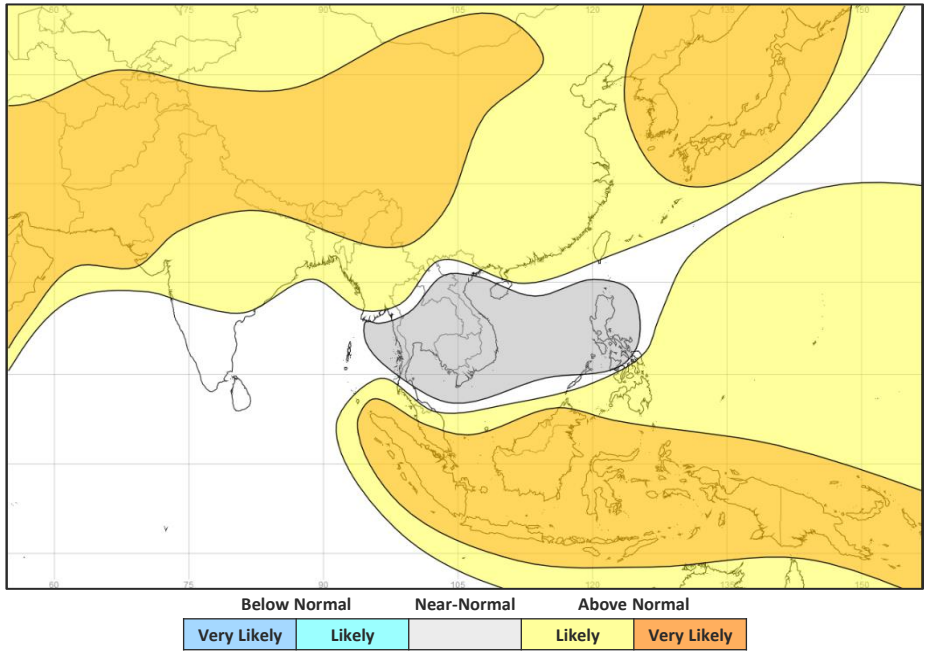
Current Status:

Warm to hot conditions have been steadily increasing in extent across large parts of Asia, extending from the Middle East across to China and southern Russia. To the south of this, more mixed conditions have been experienced over the last three months, with pockets of cool conditions across South East Asia. Indonesia, Malaysia, and Papua New Guinea experienced above average temperatures.

Outlook:

Above normal temperatures are likely across most of the region, and much more likely across large parts of Central Asia, Malaysia, Indonesia and Papua New Guinea. Near-normal temperatures are likely across South East Asia.

3-Month Outlook April to June - Temperature

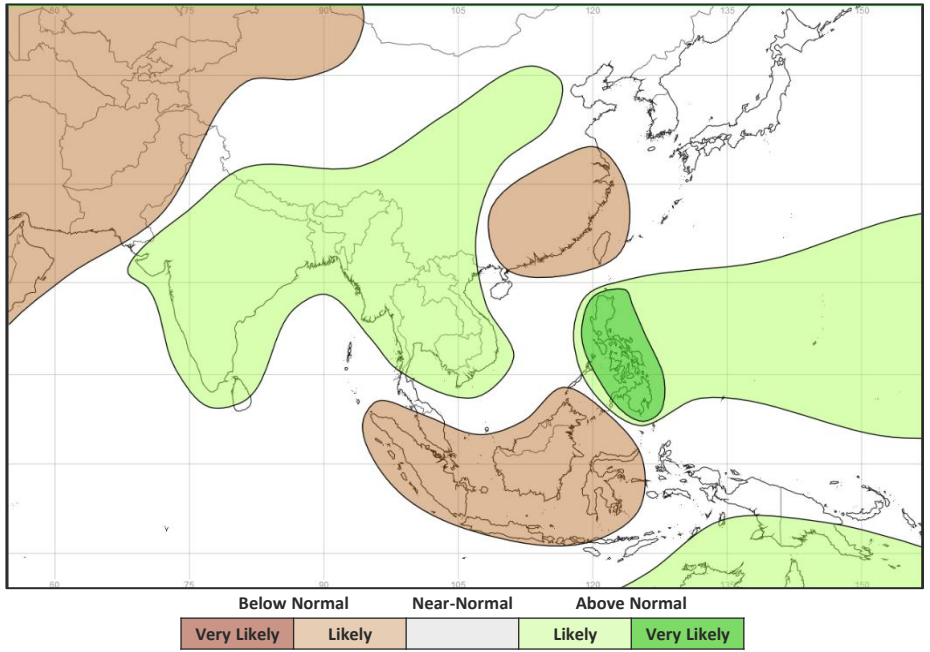


Asia Current Status and Outlook - Rainfall

Current Status:
Rainfall pattern has been highly variable across this region over the past three months. However, consistent with La Niña, pockets of wet and very wet conditions have been observed across tropical parts of southern and south east Asia.

Outlook:
Over the next three months, above normal rainfall is more likely across a swathe of the region, from India, across South East Asia to the Philippines, where it is much more likely to be above normal. It is likely to be drier than normal across eastern China, Malaysia and Indonesia.

3-Month Outlook April to June - Rainfall



Global Outlook - Temperature

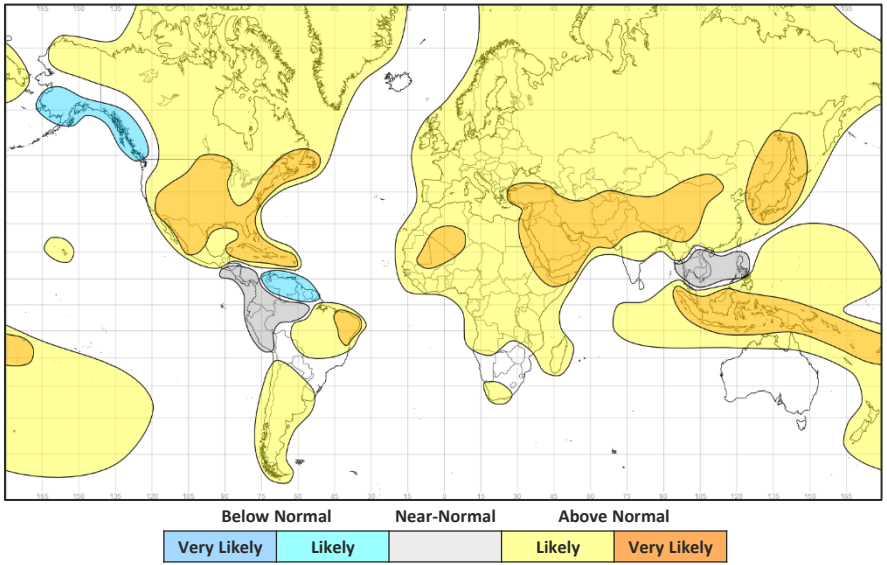
Outlook:

With the current El Niño–Southern Oscillation (ENSO) prediction indicating the possibility of change to neutral conditions over the next three months, La Niña is having less of a cooling influence on the forecast. In the context of climate change, this means that most of the the world's land area is likely to see above normal temperatures.

For the next three months, temperatures are very likely to be warmer than normal across most of the US and Caribbean, the Middle East extending east across Central Asia towards Japan, as well as Malaysia/Indonesia and adjacent countries.

Notable exceptions to this are northern parts of South America, which is accompanied by wetter than normal conditions (see slide 6). The Pacific coast of Canada and Alaska is also likely to be cooler than normal.

3-Month Outlook April to June - Temperature



Global Outlook - Rainfall

Outlook:

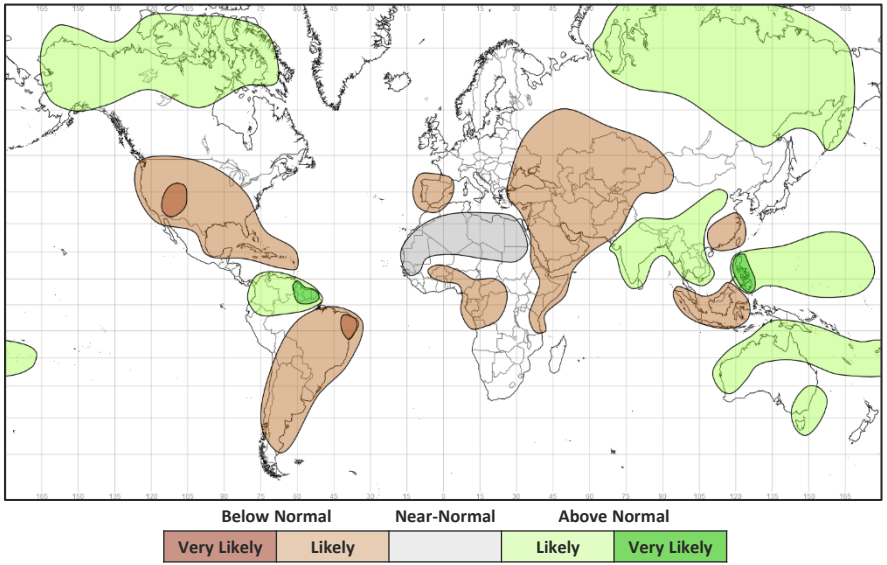
Whilst La Niña conditions are predicted to decline, La Niña will still have an influence on rainfall patterns through some of this period (though it is more weakly represented in the total 3-month outlook period)

The La Nina associated suppression of rainfall over the tropical Pacific Ocean can also lead to increases in rainfall across the tropical land areas; this below normal and above normal rainfall pattern is predicted for Indonesia and South East Asia respectively over the next three months.

For the next three months, conditions are likely to be drier than normal for large parts of the Americas, the main exception being northern South America where due to a northward displaced Intertropical Convergence Zone, conditions are likely to very likely to be wetter than normal on the Atlantic facing coasts and adjacent countries.

For the next three months as the seasonal rains advance northwards it is likely to be drier than normal in east Africa, especially near the coast. Parts of west Africa are also likely to be drier than normal due to indications that the West African Monsoon may be less active than normal over the next three months. Conditions are also likely to be drier than normal across most of the Middle East and into Central Asia.

3-Month Outlook April to June - Rainfall



Current Status

Current Status maps

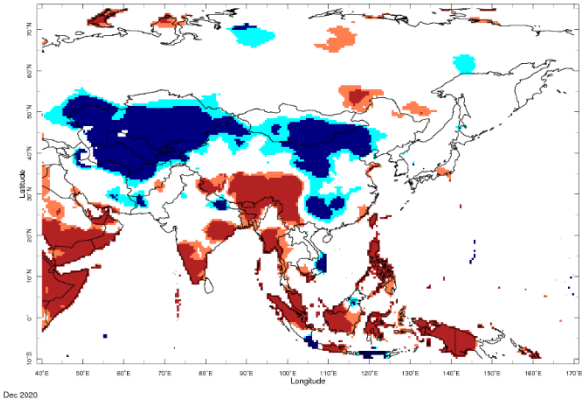
Central Asia

Southern Asia

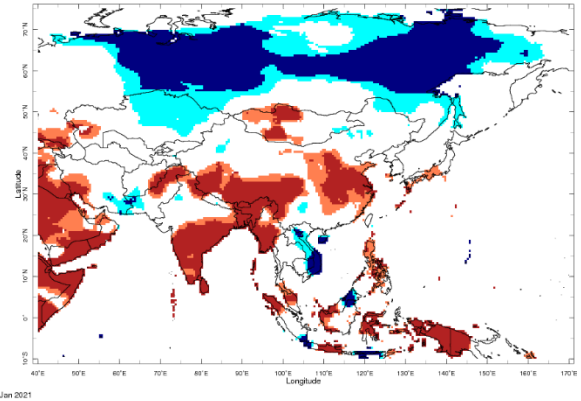
Southeast Asian Peninsula

Southeastern Asia / Indonesia

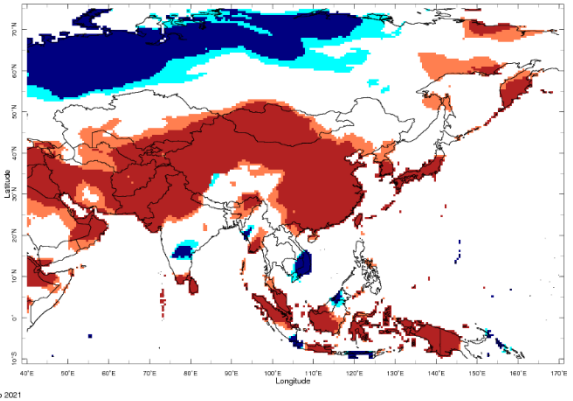
Current Status – Temperature percentiles



December



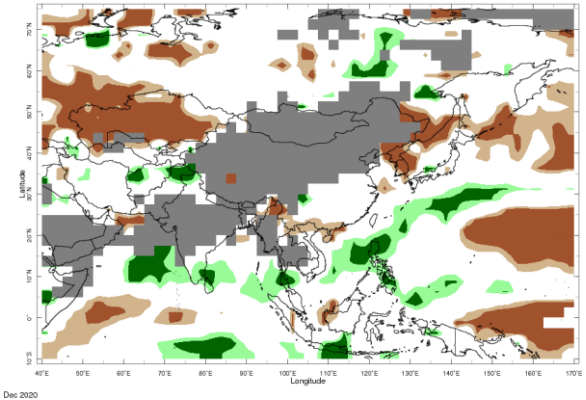
January



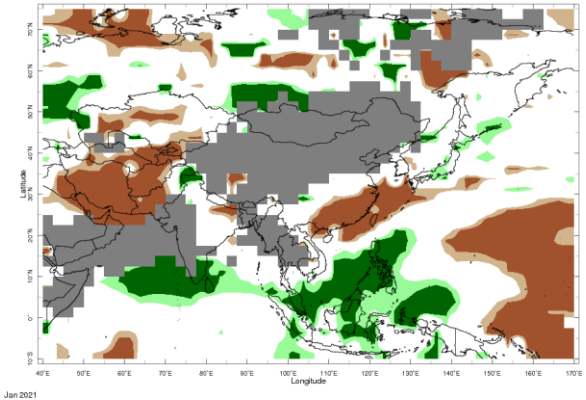
February

Notes: The percentiles shown in the map indicate a ranking of temperature, with the 0th percentile being the coolest and the 100th percentile being the warmest in the 1981-2010 climatology. Orange and red shading represent values above the 80th (Warm) and 90th (Hot) percentile, respectively; regions shaded in light and dark blue indicate values below the 20th (Cool) and 10th (Cold) percentile, with respect to the 1981-2010 climatology. The data used in this map are from the NOAA Climate Prediction Center.

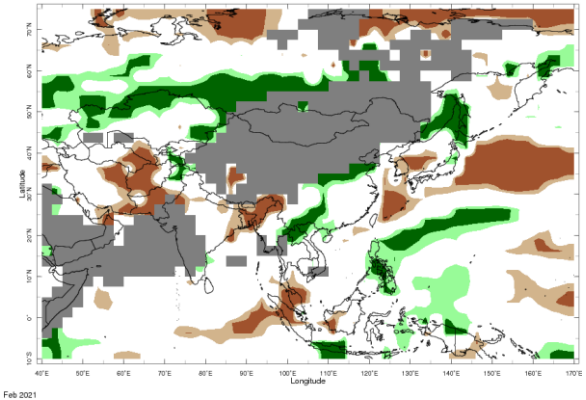
Current Status – Precipitation percentiles



December



January



February

Notes: The percentiles shown in the map indicate a ranking of rainfall, with the 0th percentile being the driest and the 100th percentile being the wettest in the 1981-2010 climatology. Green and dark green shading represent values above the 80th (Wet) and 90th (Very Wet) percentile, respectively; regions shaded in light and dark brown indicate rainfall below the 20th (Dry) and 10th (Very Dry) percentile, with respect to the 1981-2010 climatology. Grey areas on the map mask out regions that receive less than 10 mm/month of rainfall on normal in the 1981-2010 climatology for the month. The data used in this map are from the NOAA Climate Prediction Center.

Current Status – Central Asia

	Current Status: Temperature			Current Status: Rainfall		
	December	January	February	December	January	February
Afghanistan	Cold	Normal	Hot	Normal	Very Dry	Dry
Tajikistan	Cold	Normal	Hot	Normal	Very Dry	Very Wet
Kyrgyzstan	Cold	Normal	Hot	Normal	Very Dry	Normal

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

^Note:

Current Status – Southern Asia

	Current Status: Temperature			Current Status: Rainfall		
	December	January	February	December	January	February
Pakistan	Normal	Mixed	Hot	Normal	Mixed^^	Mixed^^^^^
India	Mixed^	Hot	Mixed^^^^	Normal	Mixed^^^	Normal
Nepal	Mixed	Normal	Normal	Normal	Normal	Normal
Bangladesh	Hot	Hot	Normal	Normal	Normal*	Very Dry

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

^Note: Mainly normal in east of country, hot elsewhere in October. For November, the northwest was Cool, east and south Hot and elsewhere near normal. In December, Hot in the East and South, normal elsewhere

^^Note: Very Wet in parts of the north, Very Dry in parts of the south.

^^^Note: Very Wet in the far south

^^^^Note: Hot in the northeast, mostly Normal elsewhere, apart from very cold in central-southern regions.

^^^^^Note: Very Dry in the south, but Very Wet in the north.

Current Status – Southeast Asian Peninsula

	Current Status: Temperature			Current Status: Rainfall		
	December	January	February	December	January	February
China	Cool^	Mixed	Hot	Normal	Very Dry^^	Normal
Myanmar	Warm	Hot	Mixed	Normal	Normal	Normal
Vietnam	Cool	Cool	Cold	Normal	Normal	Normal*

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

^Note: Hot conditions continued across southern parts of China, whilst a large area of cold developed across many northern areas.
^^Note: In the south and southeast. Normal elsewhere

Current Status – Southeastern Asia / Indonesia

	Current Status: Temperature		
	December	January	February
Indonesia	Hot^	Mixed	Hot
Papua New Guinea	Hot	Hot	Hot

	Current Status: Rainfall		
	December	January	February
Indonesia	Normal	Mixed^^	Mixed
Papua New Guinea	Normal	Normal	Normal

Notes:

The table gives an assessment of whether temperature and rainfall across each country have been above normal, normal or below normal over the past three months, using data from the NOAA Climate Prediction Center and the IRI Map Room: http://iridl.ldeo.columbia.edu/maproom/.

* Region usually experiences less than 10mm/month rainfall during the month (dry season).

Additional Information:

^Note: whilst most of the country was hot, Java and islands to the east were cold.
^^Note: Highly variable, all areas normal or wet/very wet

Outlooks

Outlooks – Notes for use

Central Asia

Southern Asia

Southeast Asian Peninsula

Southeastern Asia / Indonesia

Outlooks: Notes for use

Outlooks for months 4 to 6:

As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range.

Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Climatological odds:

A forecast is only provided in the outlooks where there is information in the model data about likely outcomes. Therefore, where the likelihoods for above-, near- and below- normal conditions are evenly balanced the phrase 'climatological odds' will be used. This means the outcome could fall anywhere within the possible climatological range. Near-normal conditions should not necessarily be assumed, and users should update with shorter-term forecasts when available.

Outlook: April to September – Central Asia

		Forecast summary		
		April	April to June	July to September
Afghanistan	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal	Climatological odds – see note
Tajikistan	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal	Likely to be drier than normal
Kyrgyzstan	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal	Likely to be near-normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: April to September – Southern Asia

		Forecast summary		
		April	April to June	July to September
Pakistan	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal	Climatological odds – see note
India	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal** in the north, but Climatological odds – see note in the south	Climatological odds – see note
	Rainfall	Likely to be wetter than normal in the far south, otherwise likely to be near-normal	Likely to be wetter than normal	Climatological odds – see note
Nepal	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Climatological odds – see note	Likely to be wetter than normal	Climatological odds – see note
Bangladesh	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal** in the north, more likely to be warmer than normal in the south	Likely to be warmer than normal
	Rainfall	Climatological odds – see note	Likely to be wetter than normal	Climatological odds – see note

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: April to September – SE Asian Peninsula

		Forecast summary		
		April	April to June	July to September
China	*Temperature*	Likely to be warmer than normal	Likely to be warmer than normal to **much more likely be warmer than normal**	Likely to be warmer than normal
	Rainfall	Climatological odds – see note	Likely to be drier than normal in the far northwest and southeast, likely to be wetter than normal in parts of Central China	Climatological odds – see note
Myanmar	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal** in the north, likely to be near-normal in the south	Much more likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Climatological odds – see note
Vietnam	*Temperature*	Likely to be near-normal	Likely to be near-normal	Likely to be warmer than normal
	Rainfall	Likely to be wetter than normal	Likely to be wetter than normal	Climatological odds – see note

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Outlook: April to September – SE Asia / Indonesia

		Forecast summary		
		April	April to June	July to September
Indonesia	*Temperature*	Likely to be warmer than normal	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Likely to be drier than normal	Likely to be drier than normal	Likely to be wetter than normal
Papua New Guinea	*Temperature*	**Much more likely to be warmer than normal**	**Much more likely to be warmer than normal**	Likely to be warmer than normal
	Rainfall	Climatological odds – see note	Climatological odds – see note away from the far south, where **likely to be wetter than normal**	Likely to be wetter than normal

Outlooks for months 4 to 6: As forecast uncertainty generally increases with longer range **the 4-6-month outlook is less reliable than the 1-3 month outlook**. Outlook information will only be provided when the model data signals likely outcomes. Additionally, the longer range outlook utilises fewer models because not all seasonal models are available for the extended range. Information provided in this presentation should be used to raise early awareness of potential hazards only and should be updated with the 3-month outlook when available.

Annex 1 – Supplemental Information

For further information

WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME)
https://www.wmolc.org/

International Research Institute for Climate and Society (IRI)
http://iridl.ldeo.columbia.edu/maproom/

NOAA El Niño technical info
https://www.ncdc.noaa.gov/teleconnections/enso/indicators/sst.php

Met Office
https://www.metoffice.gov.uk/services/government/international-development

The South Asian Climate Outlook Forum (SASCOF) http://www.imdpune.gov.in/Clim_RCC_LRF/Index.html
Latest Output (Apr 2020) - http://rcc.imdpune.gov.in/SASCOF16/concensus.html

Technical notes

The WMO lead centre for long-range forecast multi-model ensemble (LC-LRFMME) produce a probabilistic multi-model mean forecast product in which the multi-model mean is based on uncalibrated model output with a model weighting system that accounts for errors in both the forecast probability and ensemble mean. The method used by LC-LRFMME separately computes a probabilistic forecast and calculates tercile probabilities with respect to climatology for each individual model, before creating the weighted multi-model mean. In seasonal prediction, shifts in the tercile probabilities are always closely associated with the shifts in the probability of extremes, and we can use the probability of terciles to provide information on the likelihood of above- or below- normal conditions. The thresholds used in the forecast summaries are defined below.

Seasonal forecasts rely on the aspects of the global weather and climate system that are more predictable, such as tropical sea-surface temperatures or the El Niño–Southern Oscillation (ENSO). However, whilst such forecasts may be able to show what is more or less likely to occur, they acknowledge that other outcomes are possible.

In addition, forecast uncertainty generally increases with longer range so the 6-month outlook is less reliable. It is also based on less information, because not all models are available to this range. Therefore the information presented here should be used to raise early awareness of potential hazards, and should be updated with the 3-month outlook when available.

In the report and tables precipitation is referred to as rainfall but in fact encompasses any form of water, liquid or solid, falling from the sky. Temperatures are the (2 metre) near-surface temperature.

Description	Definition
Much more likely to be below normal	When probability of lower tercile > 70%
More likely to be below normal	When probability of lower tercile is 40-70%
Likely to be normal	When probability of middle tercile is 40-70%
Much more likely to be near-normal	When probability of middle tercile > 70%
Likely to be above near-normal	When probability of upper tercile is 40-70%
Much more likely to be above normal	When probability of upper tercile > 70%
Climatological odds	When probabilities for all categories are roughly 33%

Global Producing Centres (GPC) forecasts used by WMO LC-LRFMME:

- GPC CPTEC (INPE),
- GPC ECMWF,
- GPC Exeter (Met Office),
- GPC Melbourne (BOM),
- GPC Montreal (CMC),
- GPC Moscow (Hydromet Centre of Russia),
- GPC Offenbach (DWD),
- GPC Pretoria (SAWS),
- GPC Seoul (KMA),
- GPC Tokyo (JMA),
- GPC Toulouse (Meteo France),
- GPC Washington (NCEP)

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