

CLIMATE CHANGE INDUCED CHANGES IN RAINFALL PATTERNS IN NEPAL

Although Nepal experienced above-normal pre-monsoon rainfall, the Department of Hydrology and Meteorology (DHM) forecasts below-average rainfall for much of the June–September 2026 monsoon season. The provinces most likely to receive below-normal rainfall are Madhesh, Lumbini, Karnali, and Koshi (DHM, 2026). Meteorologists also expect rainfall to become more irregular, with short periods of intense rainfall followed by extended dry spells, increasing the risks of both floods and droughts (Prakash, 2026).

El Niño is expected to bring delayed and reduced rainfall, which is already affecting paddy transplantation.

The monsoon season in Nepal is considered to span from June to September, during which approximately 80% of the country's annual rainfall occurs.

This uncertainty in the monsoon is expected to have a direct impact on the country's agriculture and hydropower sectors.

According to meteorologists, two main weather systems appear to be responsible for this year's weak monsoon: The El Niño effect and the Indian Ocean Dipole (IOD) (Ghimire, 2026).

In 2026, climate change and El Niño conditions are causing an erratic, delayed, and weaker monsoon in Nepal, featuring below-average total seasonal rainfall (WMO, 2026).

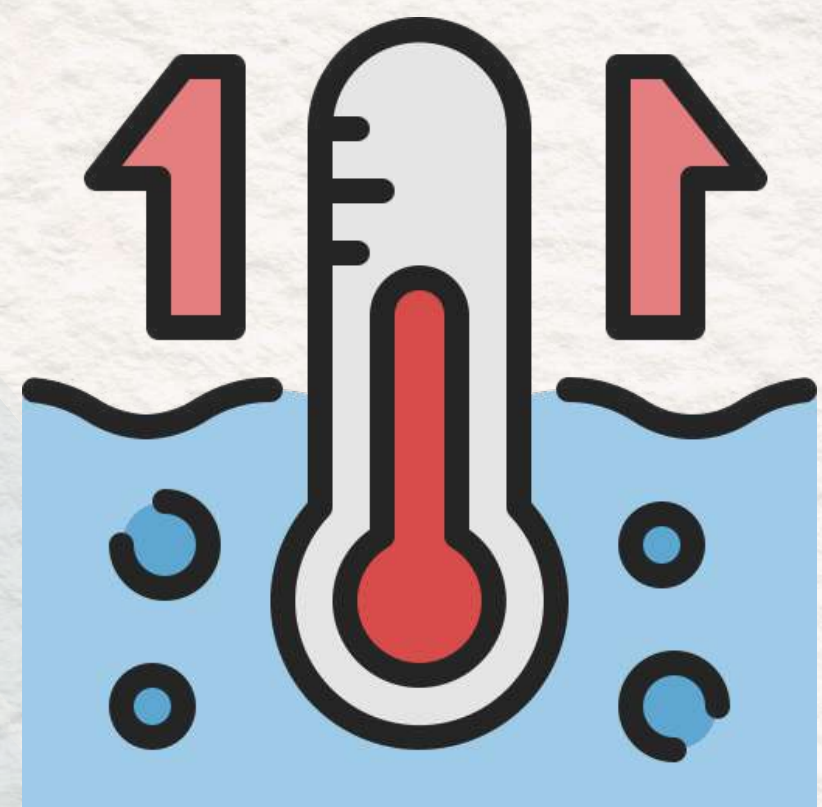


Why was the 2026 monsoon delayed?

Nepal's summer monsoon arrived six days later than the climatological average in 2026. According to the Department of Hydrology and Meteorology (DHM), the delayed onset was mainly linked to the developing El Niño–Southern Oscillation (ENSO), which altered large-scale atmospheric circulation over the Indian Ocean and South Asia. Warmer sea surface temperatures in the central and eastern Pacific weakened the moisture-carrying monsoon winds, delaying the arrival of monsoon rainfall in Nepal (DHM, 2026; NepalNews, 2026).

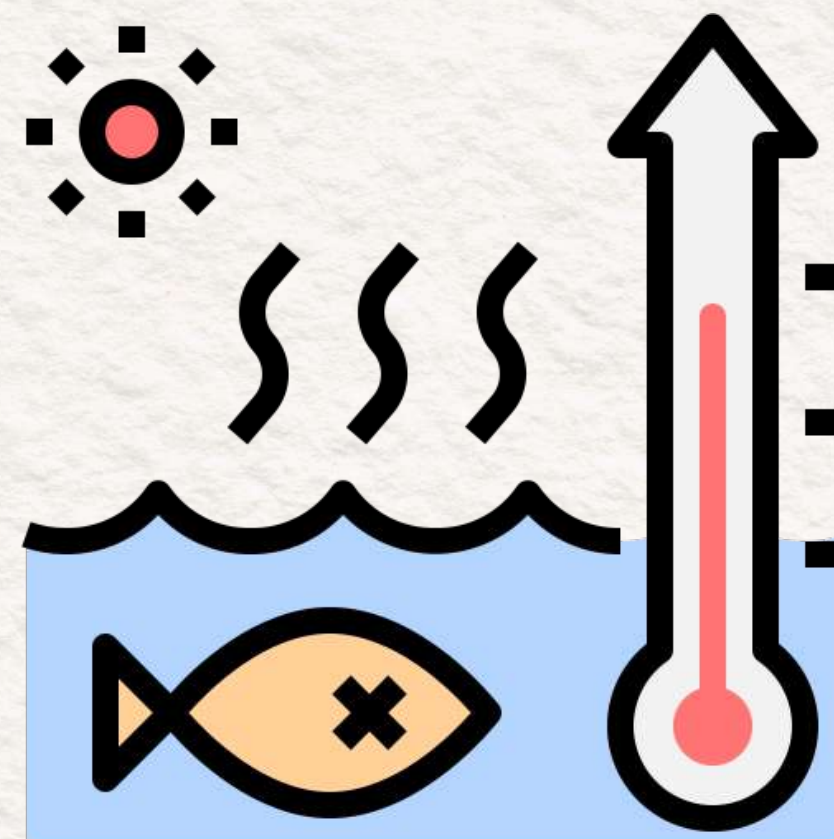
What is El Niño?

El Niño is the warm phase of the El Niño–Southern Oscillation (ENSO), a natural climate phenomenon characterized by unusually warm sea surface temperatures in the central and eastern tropical Pacific Ocean. Although it originates in the Pacific Ocean, El Niño influences weather patterns across the globe. In South Asia, El Niño often weakens the summer monsoon by reducing moisture transport from the Indian Ocean, increasing the likelihood of below-normal rainfall, higher temperatures, and drought conditions (WMO, 2026; IPCC, 2022).



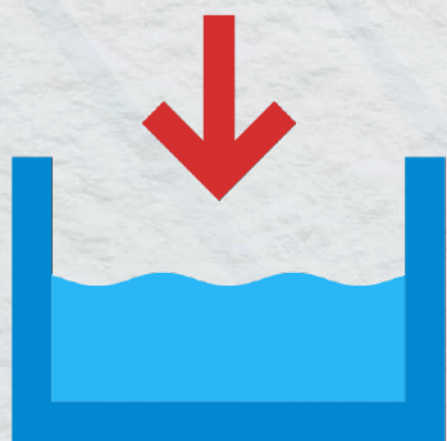
How does climate change influence El Niño?

Climate change does not directly cause El Niño, but scientific evidence suggests that a warmer climate can intensify the impacts of El Niño by increasing atmospheric moisture, raising temperatures, and making rainfall more variable and extreme. As a result, Nepal may experience longer dry spells, delayed monsoons, and occasional heavy rainfall events even during an overall drier monsoon season (IPCC, 2022).



Rainfall Outlook for Nepal (2026)

According to the Department of Hydrology and Meteorology (DHM) and regional climate outlooks:



55–65%
probability of
below-normal
rainfall.



- Most parts of Nepal are expected to receive below-normal rainfall during the June–September monsoon.

Southern Karnali, most of Lumbini, eastern Madhesh, and southern Koshi have a 55–65% probability of below-normal rainfall.

Maximum and minimum temperatures are likely to remain above normal.

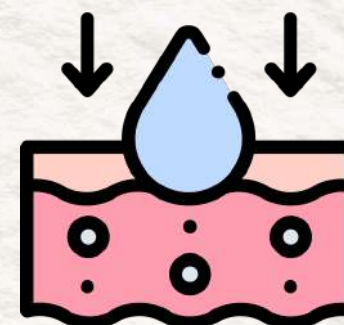
Despite the forecast of lower seasonal rainfall, localized intense rainfall events may still occur, increasing the risk of floods and landslides.

Impacts of delayed monsoon in Nepal

Agriculture



Delayed rice transplantation



Reduced soil moisture



Increased irrigation demand

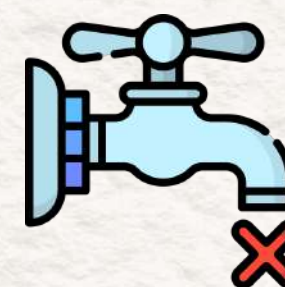


Lower crop yields

Water Resources



Drying springs and streams



Water shortages for drinking and irrigation



Reduced hydropower generation

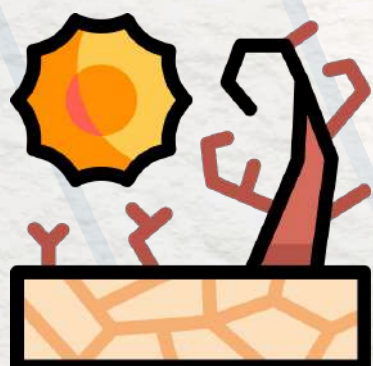


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Impacts of delayed monsoon in Nepal

Disasters



Higher drought risk in regions with rainfall deficits



Flash floods and landslides from localized heavy rainfall



Increased soil erosion

Sources

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