Meteorological Data and Climatology Lead Executive

Climatology and Remote Sensing Desk

Ten Daily Satellite Rainfall Estimation and Vegetation Coverage Bulletin

2nd Dekad of June 2026

Date: June 22, 2026

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As an entity responsible for monitoring local and country-wide climatic features and their day-to-day evolution, the National Meteorological Agency of Ethiopia strives hard to present useful information to different socio-economic activities. The production of satellite-based rainfall estimates and vegetation greenness bulletin is part of this effort.

The launch of meteorological satellites which happens as a result of technological advancement opens a new horizon in weather and climate monitoring. Unlike manned point observations, satellites collect data on clouds, vegetation, and other parameters from parts of the world that are not easily reachable or accessible. Satellite observation supplements ground manned observation and when it comes to vegetation cover, it is the only source of information.

The Ethiopian Meteorological Institute uses products from the TAMSATA group based in UK and Copernicus for producing dekadal rainfall estimates and vegetation greenness bulletins. We have a strong belief that various socio-economic activities related to planning disaster mitigation, water resources management, construction, environmental protection, transportation, recreation, tourism, and others will benefit most from the careful and continuous use of this bulletin. Meanwhile, your comments and constructive suggestions are highly appreciated to make the objectives of this bulletin a success.

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Introduction

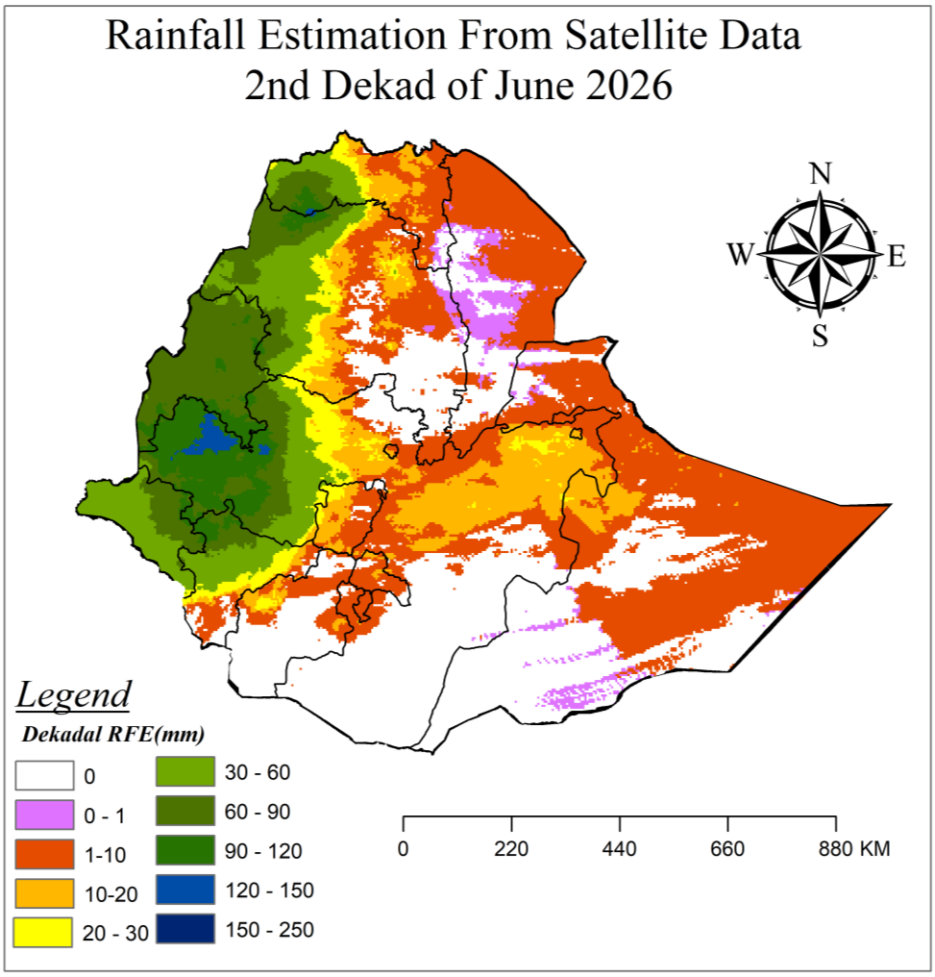
Satellite remote sensing is a valuable tool for estimating vegetation distribution and productivity across large spatial scales. Among the various indices used, the Normalized Difference Vegetation Index (NDVI) is the most widely applied for assessing vegetation greenness and has been utilized in numerous studies (Brandt et al., 2015; Chen et al., 1998; Santos & Negri, 1997; Zhang et al., 2009). The spatial distribution of NDVI, and consequently of terrestrial vegetation, is largely influenced by climatic factors such as rainfall and temperature. A well-documented relationship between NDVI and rainfall exists across various spatial and temporal scales (Davenport et al., 1993; Grist et al., 1997; Nicholson et al., 1990; Potter & Brooks, 1999; Wang et al., 2001). While results vary, these studies consistently highlight rainfall as a key predictor of vegetation distribution, particularly in transitional zones where ecosystems shift from humid to arid or semi-arid conditions. This relationship is especially evident in regions like the Sahel of Africa, where rainfall patterns significantly impact vegetation cover (Zhao et al., 2015).

Rainfall is a critical resource for many socioeconomic activities, particularly in African countries that rely heavily on rain-fed agriculture. Over recent decades, these countries have experienced significant challenges due to rainfall variability and long-term changes in both the amount and distribution of rainfall. However, the network of rain gauges across Africa is sparse, unevenly distributed, and deteriorating, limiting the accuracy and reliability of ground-based rainfall measurements. To address this gap, satellite-based rainfall estimates are increasingly being used as a substitute for, or to supplement, gauge observations, providing broader spatial coverage and more consistent monitoring of rainfall patterns (Tufa Dinku et al.).

In this bulletin, satellite-derived rainfall estimates and vegetation greenness conditions for the second dekad of June 2026 were analyzed using TAMSAT rainfall data and METEOSAT vegetation products. During this period, moderate rainfall was recorded in some Kiremt rain-benefiting areas. As a result of the strong relationship between rainfall and the Normalized Difference Vegetation Index (NDVI), most Kiremt-benefiting areas, including the northern, northwestern, and central parts of the country, as well as several other regions, exhibited good vegetation cover. Conversely, Afar, Somali, and southern Oromia regions, along with some pocket

areas of Amhara and Tigray, received little to no rainfall. Consequently, sparse to bare vegetation conditions were observed in these areas.

Rainfall Estimation from Satellite Data

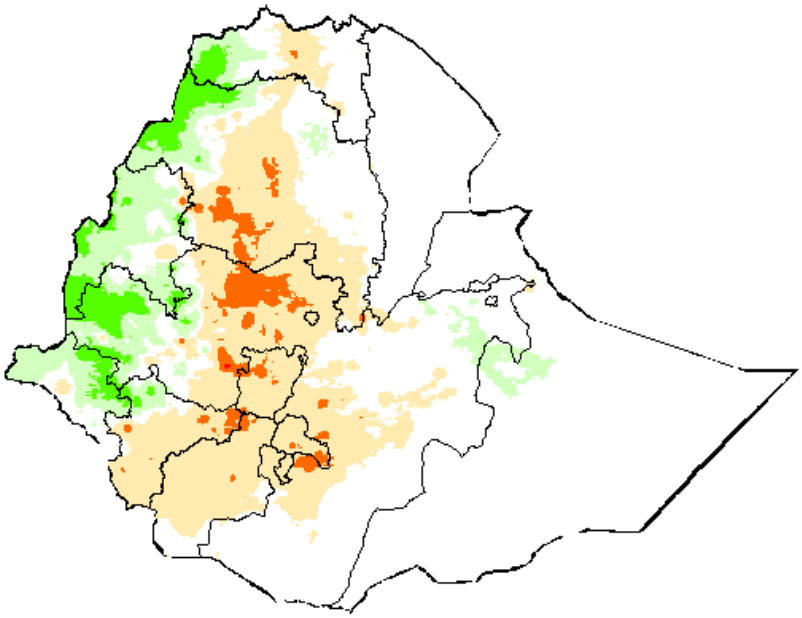


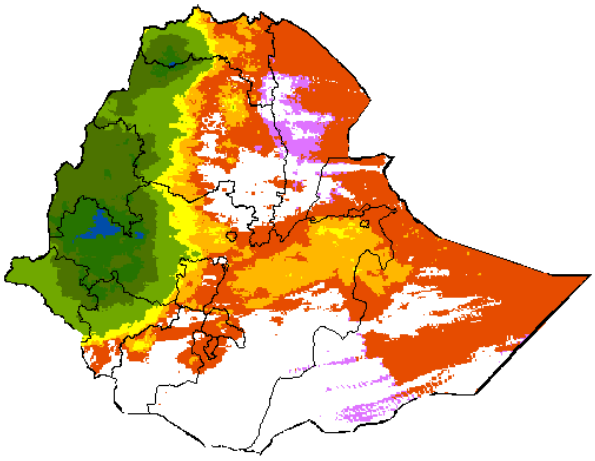
Rainfall distribution

The Kiremt season, which extends from June to September, is the principal rainy season for most parts of the country, particularly the northern, northwestern, and central regions. By the second dekad of June 2026, rainfall had commenced across several parts of the country. Notably, Benishangul-Gumuz, Gambella, South West Ethiopia, Western Oromia, Amhara, and Tigray regions received rainfall amounts ranging from 10 to 120 mm. In contrast, little to no rainfall was recorded in other parts of the country, reflecting the spatial variability in precipitation distribution during this period.

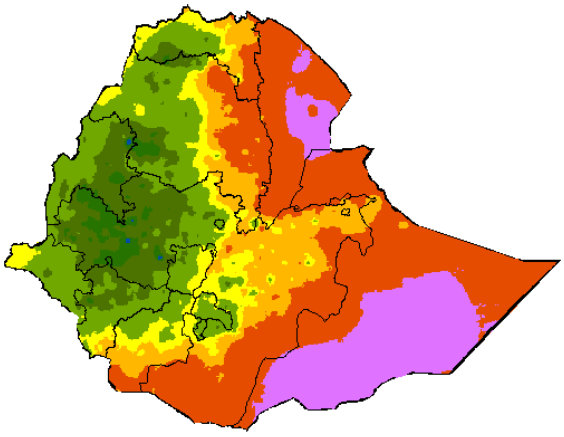
Comparison with climatological normal

During this dekad, a comparison between satellite rainfall estimates and the climatological average revealed a slight to moderate increase in rainfall was observed in Benishangul Gumuz, Gambella, some pocket areas of South West Ethiopia, Amhara, Tigray and western Oromia regions**.** A slight to moderate decrease in rainfall was observed in Central Ethiopia, Sidama, South Ethiopia, South West Ethiopia, most of Amhara and Oromia regions. No significant changes were recorded in the rest of the country.





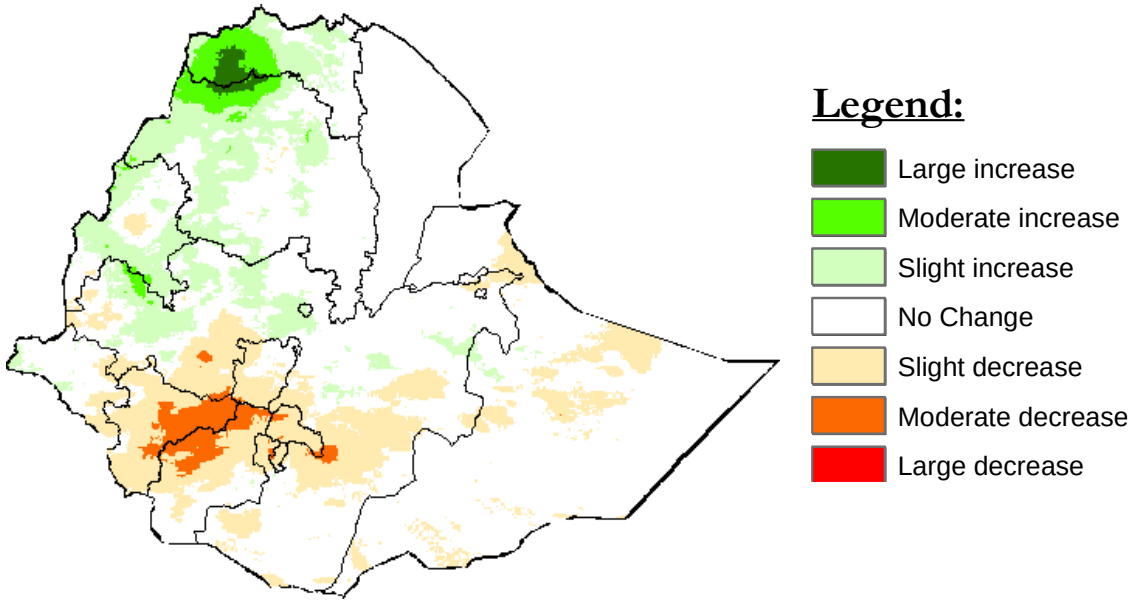
Current dekad



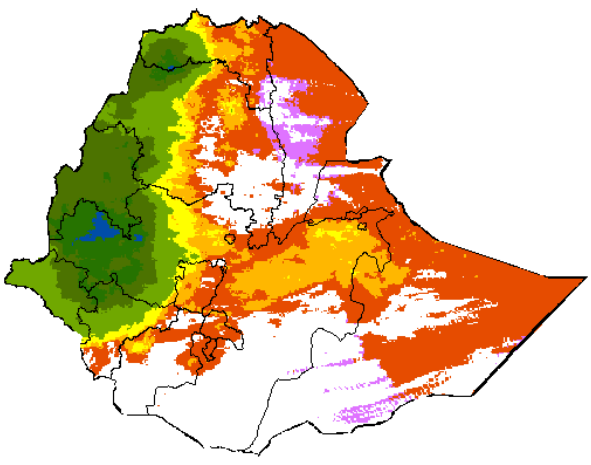
Climatological normal

Comparison with the previous Dekad

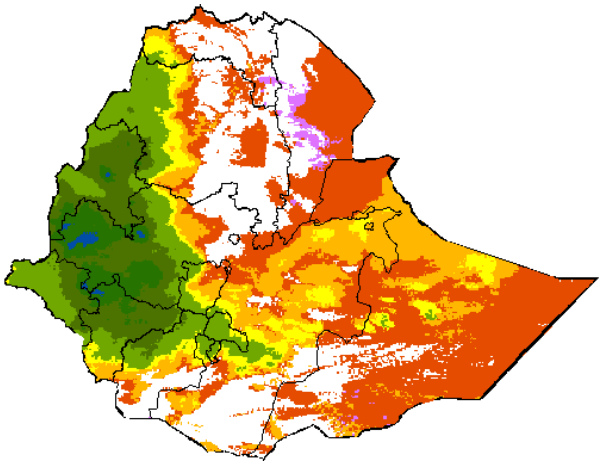
A comparison between the 2nd dekad of June 2026 and the 1st dekad of June 2026 shows a slight to large increase rainfall was observed in Tigray, Amhara, Benishangul Gumuz, and some pocket areas of Oromia regions. On the other hand a slight to moderate decrease showed in South Ethiopia, South Western, Central Ethiopia, Sidama, and southern Oromia regions.



Difference of two Dekad



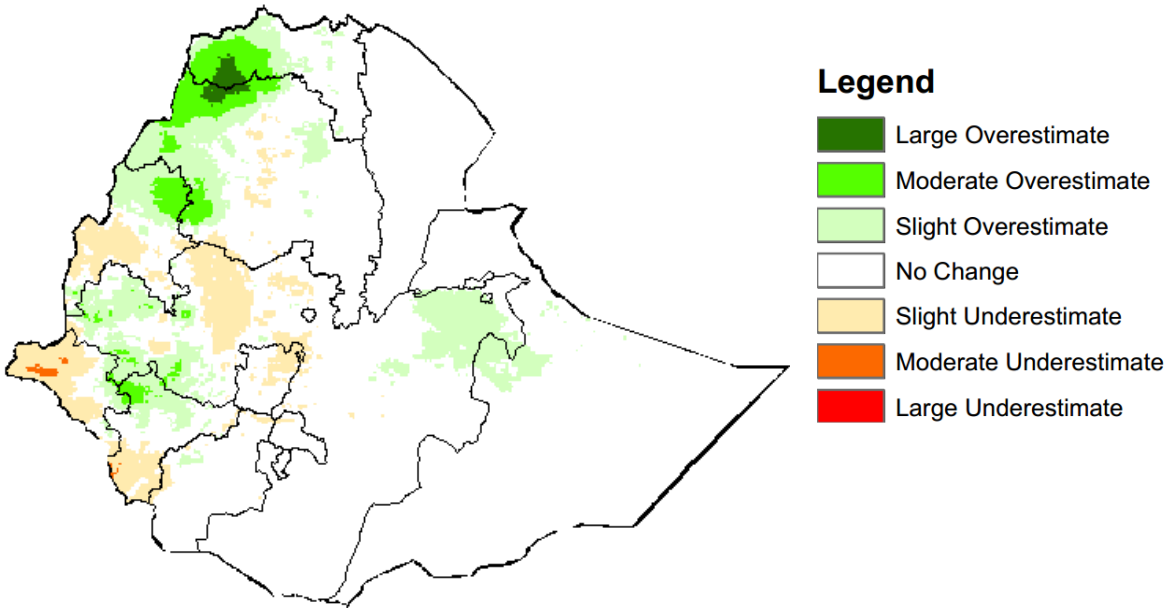
Current dekad

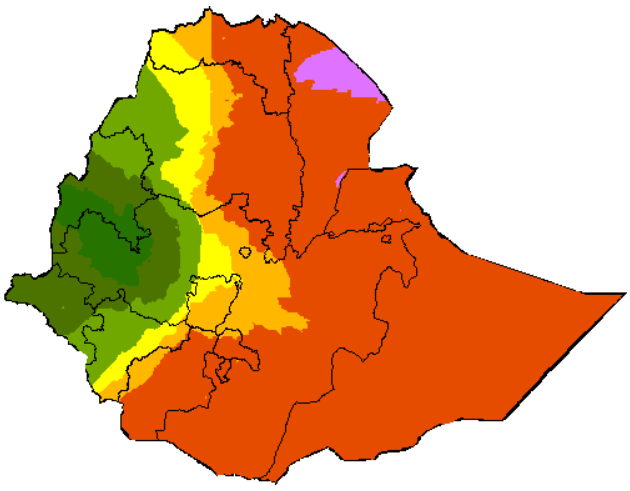


Previous dekad

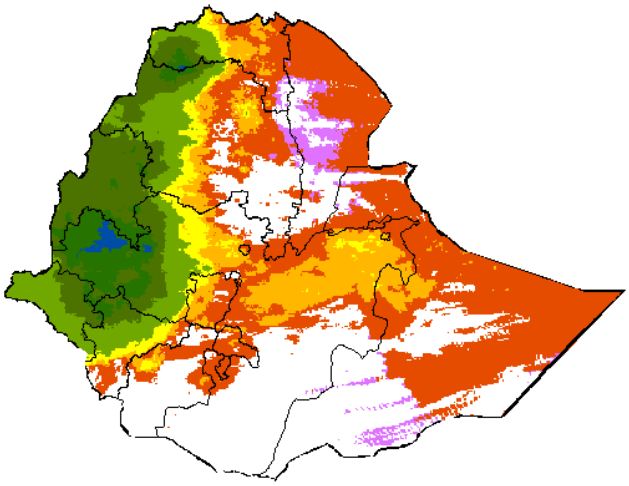
Comparison with the ground observation

The satellite rainfall estimation indicates there was a slight to large overestimate observed in Tigray, some of Amhara, western Oromia and Benishangul Gumuz regions. A slight underestimate in Gambella, some pocket areas Central Ethiopia, central Oromia, and Benishangul Gumuz regions.



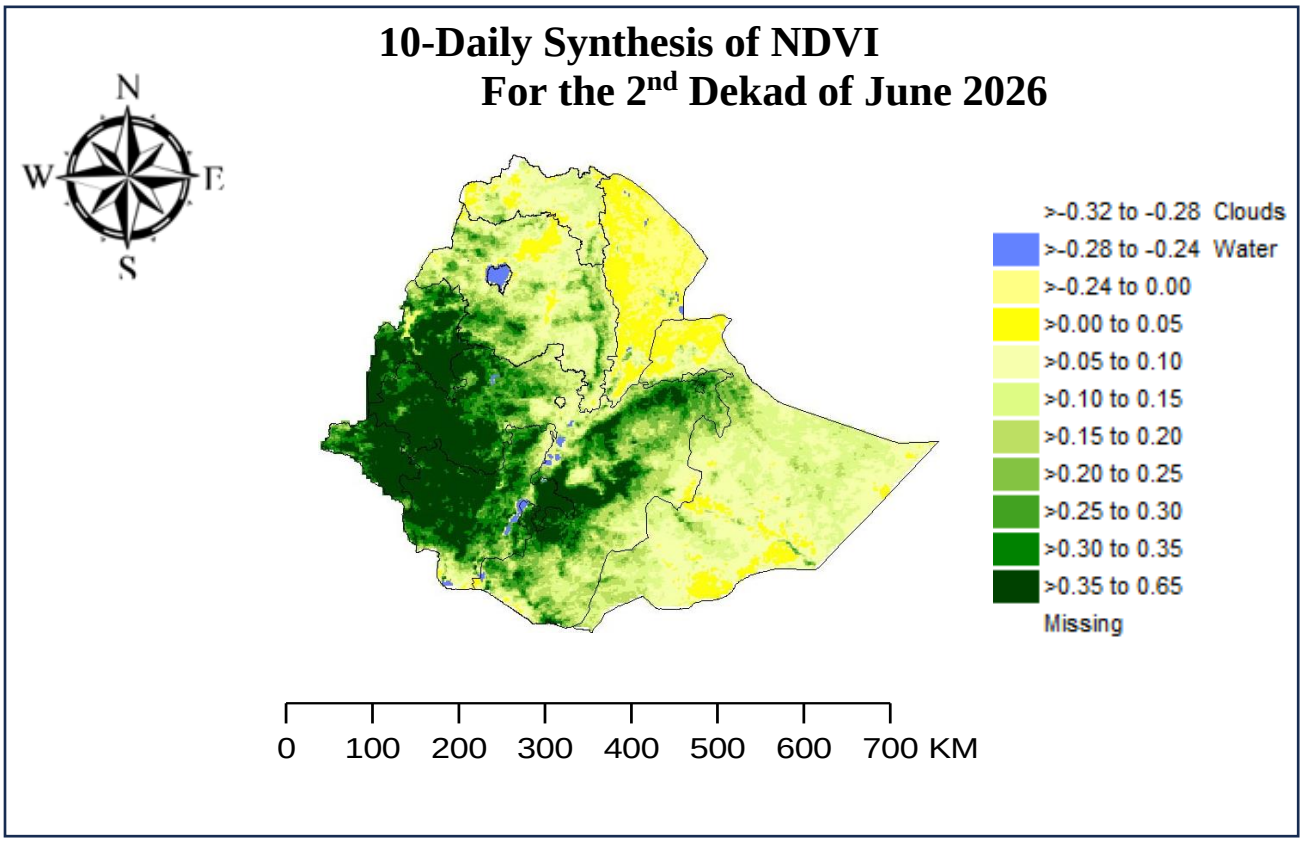


Ground Observation



Satellite rainfall estimation

10-Daily Synthesis of NDVI



Assessment of synthesis NDVI for the 2nd dekad of June 2026

The NDVI distribution for this dekad shows high greenness over most parts of the country. However, low NDVI values were observed in certain areas. Specifically, South West Ethiopia**,** South Ethiopia**,** Benishangul Gumuz**,** Sidama**,** Gambella**,** Central Ethiopia**,** and central and western Oromia regions exhibit high to moderate greenness. In contrast, Afar and some parts of the Somali region show low to bare greenness. (Refer to the actual figure above for detailed visualization).

Comparison with the Climatological Normal

A comparison between the current dekad and the climatological normal shows a small to large increase in greenness in Sidama, South West Ethiopia, South Ethiopia, and Amhara, western and central Oromia regions. In contrast, a small to large decrease in greenness was observed in some pocket areas of Somali, Amhara, Oromia, Gambella,Tigray and Benishangul Gumuz regions.