

SUDAN CRISIS ANALYSIS

Anticipating Agriculture Conditions: Supporting Farmers to Avoid Another Underproductive Harvest

MARCH 2024

This briefing paper provides an overview of findings from satellite imagery analysis aiming to tentatively predict vegetation health in agricultural areas in Gedaref, Blue Nile, South Kordofan and Kassala states for the upcoming early-season planting period until July 2024. It is part of a series of crisis analysis briefing papers by Mercy Corps following the outbreak of conflict in Sudan, and follows satellite imagery analysis conducted in [August 2023](#) and [September 2023](#), which measured vegetation health in agricultural areas to better understand the impact of conflict on agriculture and anticipate challenges with the harvest.

The outbreak of conflict in Sudan on 15 April 2023 has severely impacted food security and agricultural production in the country.¹ In February 2024, 37% of the population are [estimated](#) to be in IPC Phase 3 or above - the highest proportion on record in the post-harvest period in Sudan - whilst the production of staple foods in 2023 is [estimated](#) to have been 24% - 50% below average (estimations for sorghum and millet respectively). Given the ongoing impediments to humanitarian access and importance of agriculture for livelihoods, domestic food production will be a key determinant of food security throughout 2024.

The spread of conflict towards the South East in December 2023 [threatens](#) to further disrupt food production in the “breadbasket” of the country in 2024. As well as direct impacts of conflict, which include **destruction, looting and displacement**, agricultural production is vulnerable to conflict-related drivers such as **disruption to agricultural labor markets, low supply and high price of agricultural inputs, lack of usual government assistance to farmers, poor maintenance of irrigation infrastructure**, and the regular risks of **unfavorable weather conditions, pests and diseases**.²



Assistance to farmers has strong potential to boost food security due to favorable weather projections.

To support agricultural programming, Mercy Corps has produced projections of cropland vegetation health in Kassala, Gedaref, Blue Nile and South Kordofan for the first months of 2024, based on expected **weather conditions**. The full results can be found in the associated reports; initial results suggest that **assistance to farmers, accompanied by support to consumers, has strong potential to boost food security due to favorable weather projections**. However, success of such assistance relies on **improved humanitarian access and a lack of spread or reduced conflict in and around agricultural areas**, and an area-based approach to response planning is essential to tackle localized drivers of food insecurity.

¹ See Mercy Corps, [Remote Sensing to Monitor Impact of Conflict on Agriculture: Round 2](#), September 2023.

² Full descriptions of reported drivers of agricultural production can be found in the full report of this research, which will be published on the Mercy Corps [website](#).

Key Findings

FIGURE 1: PROJECTIONS OF CROPLAND VEGETATION COVER IN KASSALA, GEDAREF, BLUE NILE AND SOUTH KORDOFAN:³

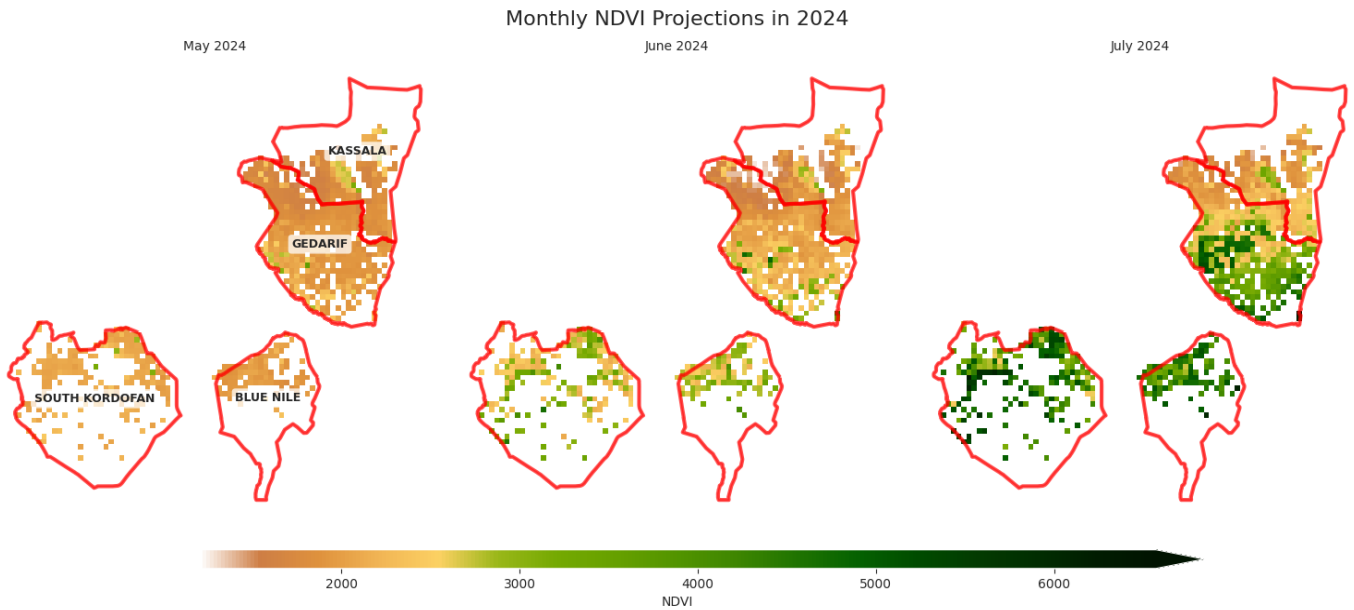
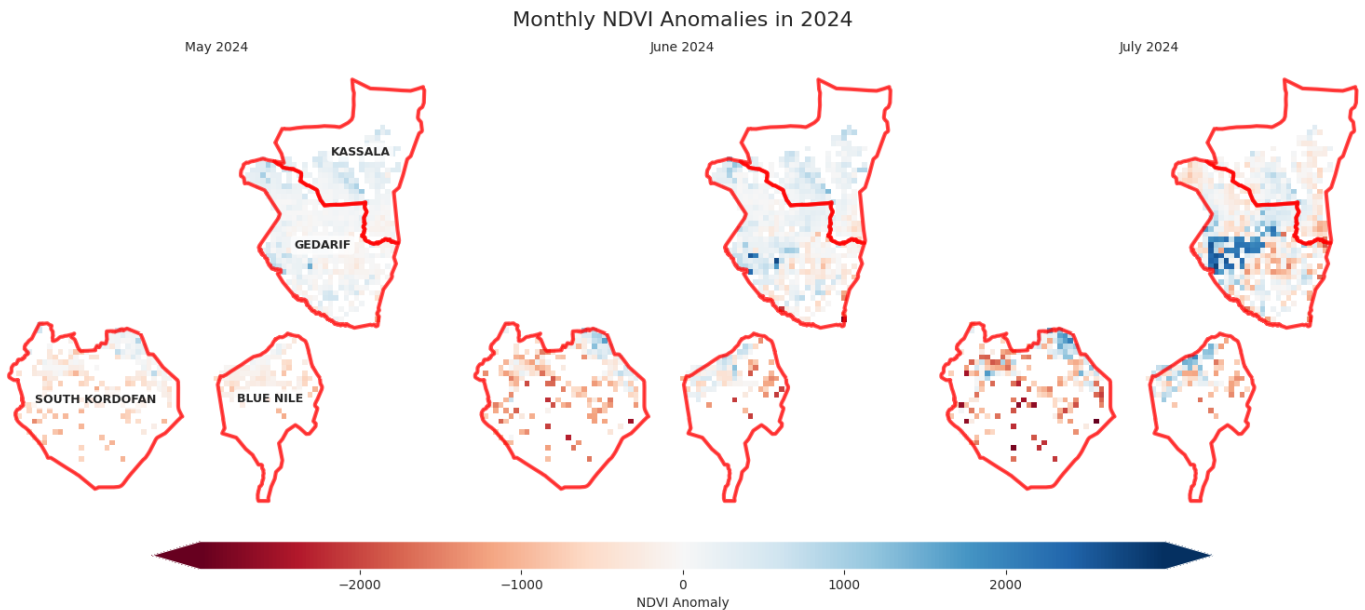


FIGURE 2: PROJECTION OF CROPLAND VEGETATION COVER IN KASSALA, GEDAREF, BLUE NILE AND SOUTH KORDOFAN, COMPARED TO 2015 - 2023 AVERAGE:⁴



³ Cropland vegetation coverage is measured using the Normalized Difference Vegetation Index (NDVI). The index is on a scale from 0 to 10,000. Projection based on precipitation, soil moisture and soil temperature data; for detailed results and methodology see the technical report which will be published on the Mercy Corps [website](#).

⁴ NDVI anomaly is calculated as the variation of the projection (Figure 1) from the average NDVI using 2015-2023 data. For example, -2000 signifies the area is 2000 NDVI points below the average (on a scale of 0 to 10,000). Projection based on precipitation, soil moisture and soil temperature data; for detailed results and methodology see the technical report which will be published on the Mercy Corps [website](#).

- [In many parts of the four assessed states, projections of vegetation health suggest that the summer planting season will start positively](#): it appears that favourable levels of rainfall and soil moisture should contribute to expanding cropland vegetation cover in June and July.
- However, conditions must be monitored carefully, as [previous analysis](#) has shown that **vegetation health can change mid-season, particularly if conflict either directly or indirectly affects farming, supply chains and markets**. Further, any unexpected inclement weather may require adjustment of projections.
- By July 2024, cropland vegetation health is projected to be **particularly positive in central Gedaref** (when compared to the average vegetation health in previous years).
- **Northeastern Gedaref and southern Kassala** are projected to see relatively **low cropland vegetation health** when compared to surrounding areas and compared to previous years. This may point to a late arrival of the rains which could delay planting, or a season-long reduction in vegetation health which could reduce agricultural production in this area over the season.
- While cropland vegetation cover is projected to be high in **South Kordofan** and **Blue Nile States**, projections suggest that pockets of these states will see **below average cropland vegetation health**. These mildly unfavorable environmental conditions may be exacerbated by conflict and economic conditions leading to particularly low agricultural production in these states.

Recommendations

- Farmers are likely to struggle to produce without assistance, due to the [economic impacts](#) of conflict since 2023. The humanitarian community should deliver **assistance to farmers**⁵ to capitalize on favorable environmental conditions for the upcoming agricultural season.
- Given the disparities in projected vegetation health across different areas of the four assessed states, area-based approaches to response planning will be required **to tackle localised drivers of food insecurity**;⁶ for example, increased measures to support households' purchasing power such as multi-purpose cash assistance where markets are functioning, and consideration of market systems development or direct food assistance in areas that are cut off from domestic agriculture supply chains and functioning markets.
- Insecurity and administrative constraints continue to impede humanitarian aid delivery across Sudan. **Humanitarian access must be improved** to allow assistance to be delivered to farmers and affected populations.
- An expansion of the current conflict in the four assessed states will have severe consequences for agricultural production, potentially reversing the benefit achieved by agricultural assistance. The international community should take more proactive steps to facilitate inclusive dialogue and negotiations to reach an **unconditioned and sustainable ceasefire** agreement that is representative of the diverse needs of the Sudanese people. This should include increased support to Sudanese civilian initiatives to promote dialogue and de-escalation, and to address the root causes of the conflict.

⁵ A description of suggested modes of assistance will be included for assessed states (Gedaref, Blue Nile, Kassala, South Kordofan) in separate state profiles that outline findings in detail, published on the Mercy Corps [website](#). This [recent analysis](#) of agri-food and payment systems in Sudan provides guidance on balancing supply and demand for agricultural produce.

⁶ The state profiles for Gedaref, Kassala, South Kordofan and Blue Nile provide an overview of agriculture production and projections of vegetation health at the locality level; these will be published on the Mercy Corps [website](#).