



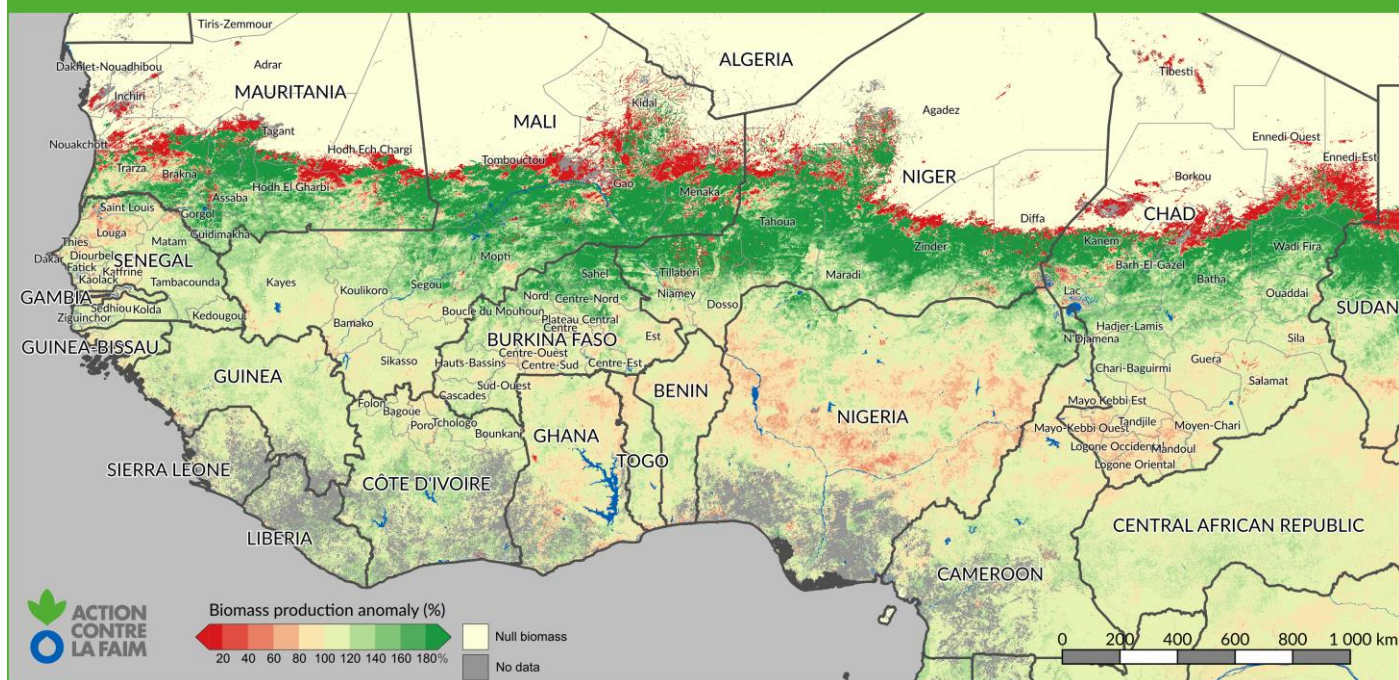
BIOMASS PRODUCTION IN 2025 ANALYSIS AND OUTLOOK FOR 2026

SAHEL REGIONAL REPORT

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**ACTION
AGAINST
HUNGER**  **ACTION
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MAP 1: ANOMALY OF BIOMASS PRODUCTION FOR YEAR 2025 IN PERCENT



HIGHLIGHTS

- Rainfall totals generally normal to above average in Sahel countries but normal to below average in Gulf of Guinea countries
- Biomass production above average across the Sahelian belt
- Biomass production low to very low in southwestern Mauritania and western Senegal
- Biomass production moderate to low in coastal countries, though higher than in 2024
- Low exposure of the region to vulnerability linked to biomass production
- River flows normal to above average
- Security context strongly hindering herd mobility and access to pastures
- Significant movements of displaced populations with livestock across several areas of the region

INTRODUCTION

This document presents a quantitative assessment of plant production during the 2025 growing season in West Africa and the Sahel.

The analysis focuses on Sahelian zones, with an overview of coastal countries.

The 2025 rainy season followed a 2024 season that was humid to very humid across most of the Sahel but less favorable in coastal areas. These good productions benefited herders during the 2025 dry season.

In 2025, the rainy season set in early to normal across the Sahel and late to slightly delayed in the Sudano-Sahelian and Guinean zones. Rainfall totals were generally normal to above average in Sahel

countries while they were normal to below average in Gulf of Guinea countries.

Despite dry spells, biomass production was good to very good across the Sahel, except in some localized areas on the western façade. In coastal countries, despite slight improvement, production remains below the average of the past 25 years.

The use of these resources by livestock is hampered by accessibility constraints. The regional context is characterized by fragmented space, growing insecurity and its expansion, the impacts of climate change on ecosystems, and particularly restrictions imposed on cross-border livestock mobility.

SYSTEM DESCRIPTION

WHAT IS BIOMASS AND HOW IS IT MEASURED?

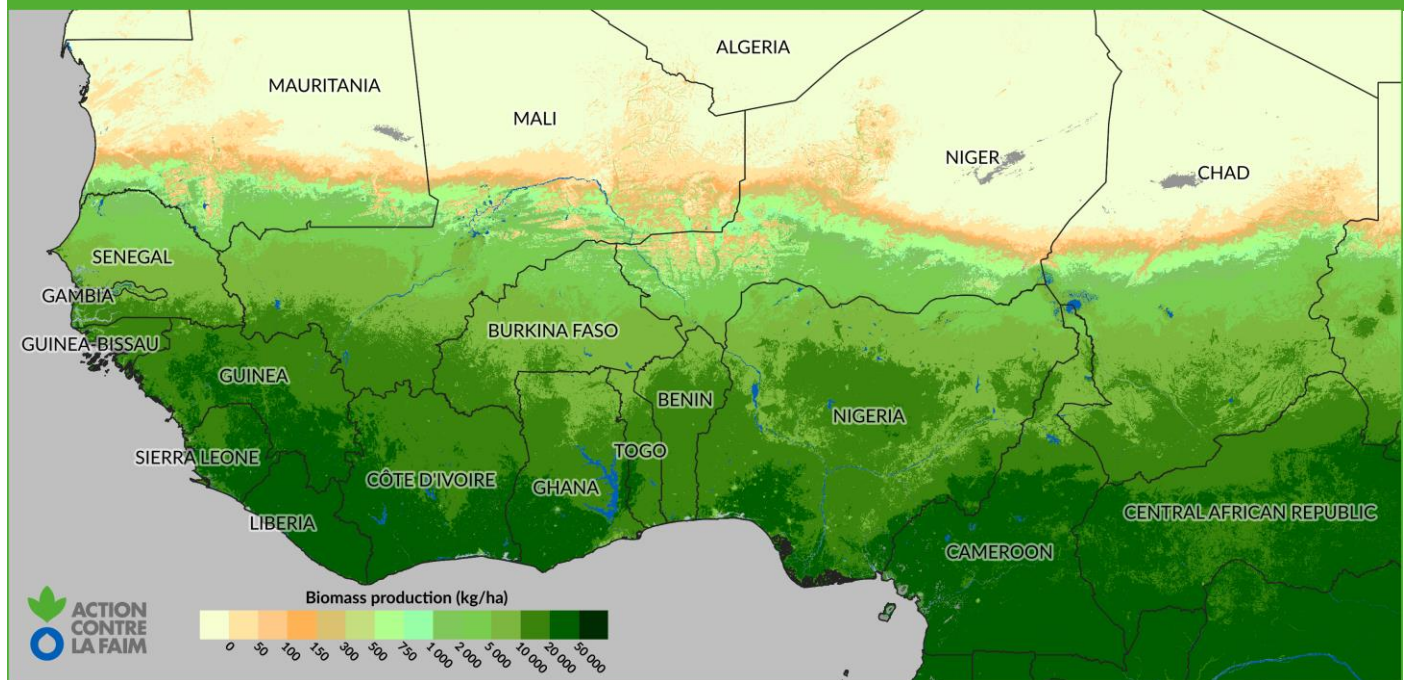
Biomass refers to the total production of plant matter, measured in kilograms of dry matter (DM) per hectare (kg/ha). The term “dry matter” designates all forms of vegetation produced above the ground, regardless of their water content. In pastoral analysis, biomass is an effective indicator for measuring the availability of forage resources.

Biomass production is calculated from satellite imagery provided by **SPOT-VEGETATION**, **PROBA-V** and **SENTINEL-3** of the European Space Agency. These data are delivered as ten-day products by the European **COPERNICUS** program through the Flemish Institute of Technology **VITO**.

Daily biomass productivity (kg/ha/day) is calculated using an algorithm that integrates biophysical parameters derived from satellite images, as well as climatic variables such as temperature and solar radiation.

The **BioGenerator** tool developed by ACF integrates all these data to produce the annual biomass production map calculated over the growing season, coinciding with the rainy season in the Sahel. The spatial resolution is 1 km, consistent with the satellite products used. The covered period extends from the satellite archive beginning in 1999 to the present.

MAP 2: AVERAGE ANNUAL BIOMASS PRODUCTION 1999-2025



WHAT INDICATORS ARE GENERATED?

The first indicator is the annual biomass production calculated over the growing season:

- **Annual production (kg/ha)**

This production is compared to the average calculated since 1998 to highlight anomalies, represented in two ways:

- **Anomaly expressed as a percentage of the average (%)**
- **Normalized anomaly expressed as the number of standard deviations (σ) from the mean**

A vulnerability index related to biomass availability, called VI (Vulnerability Index), is calculated recursively by weighting the most recent years to account for sequences of dry or wet events

- **Vulnerability Index (VI)**

Indicators can be viewed and downloaded at:

- geosahel.info
- data.humdata.org/organization/acf-west-africa

BIOMASS PRODUCTION IN 2025

MAPPING OF THE BIOMASS PRODUCTION ANOMALY

Map 1 illustrates the biomass production anomaly for 2025 in West Africa, expressed as a percentage of the average. Map 3 presents the same anomaly, but in terms of standard deviations (σ) from the mean, referred to as the normalized anomaly.

During this rainy season, biomass production was generally average to good across the region, except for some localized areas on the western façade of Senegal and Mauritania, as well as in the central coastal countries.

As in previous years, central Sahel recorded very good production. The Sahel in Burkina Faso, Tillabéri in Niger, and Gao in Mali are illustrative examples, with anomalies of 154 %, 169 %, and 129 % respectively. However, these results are lower compared to last year.

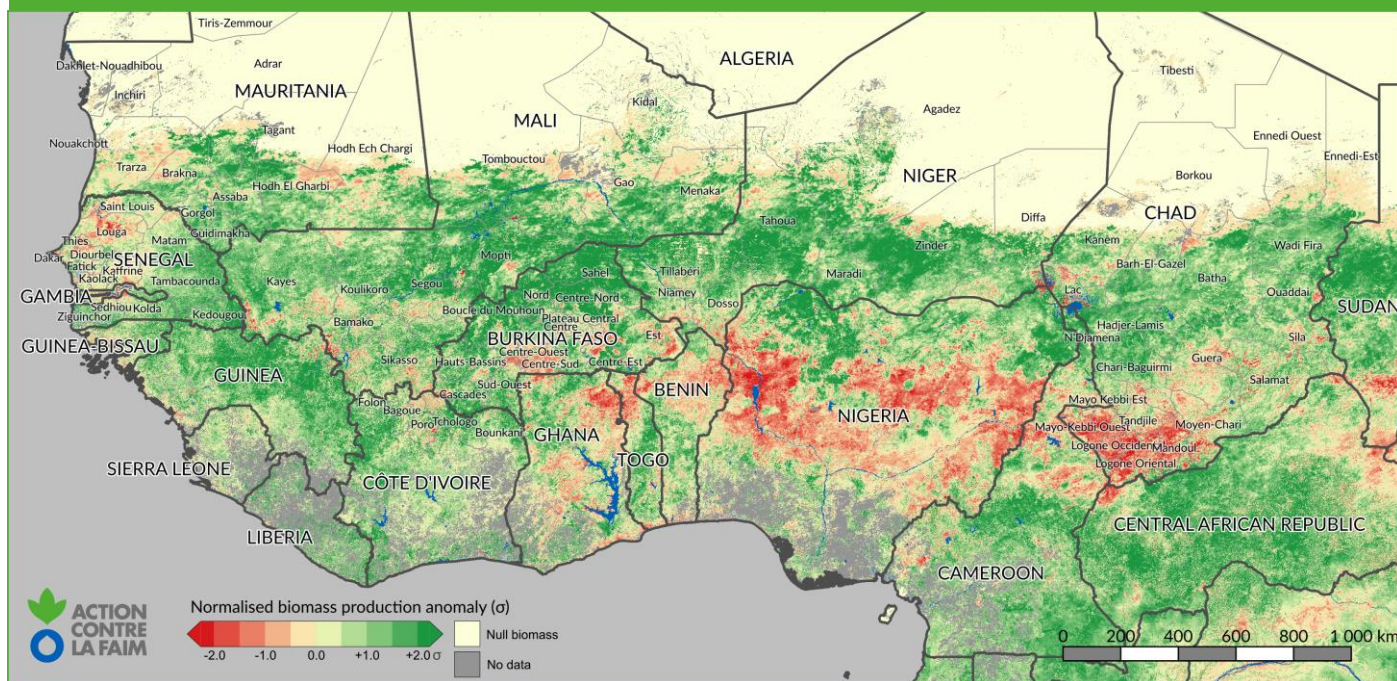
At the regional scale, two areas recorded average to low biomass production. The western Senegal-Mauritania corridor was particularly deficient, from Trarza to the southern part of Diourbel region. Deficits were more pronounced in

Louga (Senegal), with regional limits around 100 %, despite very localized deficits.

In coastal countries and the Lake Chad basin, improvement was observed compared to the previous year and the 25-year average. However, the northern Benin and central Nigeria areas recorded negative biomass production anomalies: 96 % in Alibori (Benin) and 93 % in Niger State (Nigeria). Around Lake Chad, the closer to the shores, the greater the deficits. This is explained by the shrinking of the lake and the expansion of cultivated land, leading to significant cropland at the expense of natural vegetation.

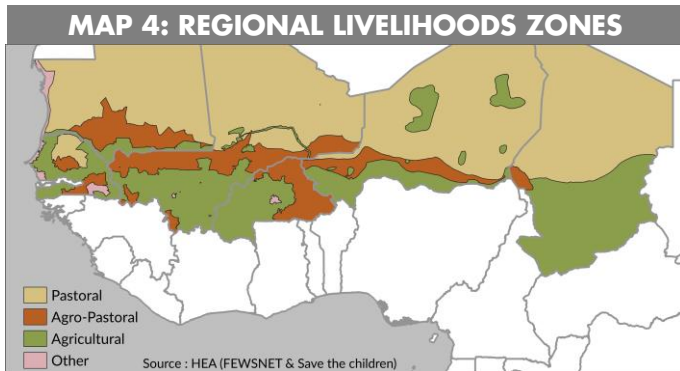
At the end of the rainy season, the region therefore had sufficient resources overall. Areas of low production were compensated for by more favourable zones along the same routes. Intra-regional or cross-border transhumance thus allowed geographic complementarity in a context where resources vary across ecosystems.

MAP 3: NORMALISED BIOMASS PRODUCTION ANOMALY YEAR 2025



INTERANNUAL VARIATIONS IN BIOMASS PRODUCTION

Based on the division by livelihood zones, it is possible to observe the interannual variation in biomass production depending on land use: agricultural and agropastoral.

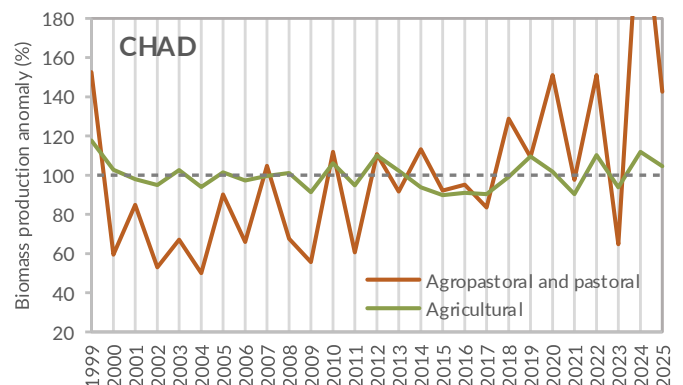
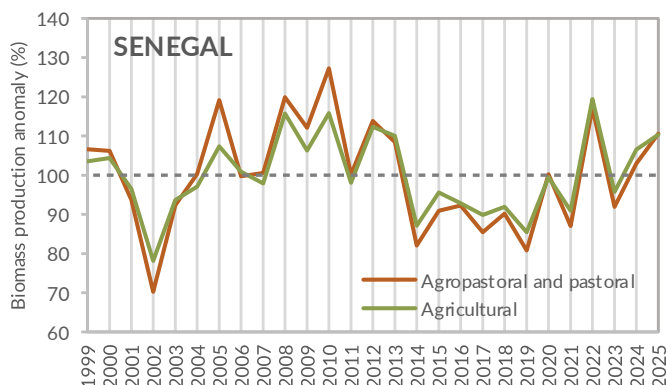
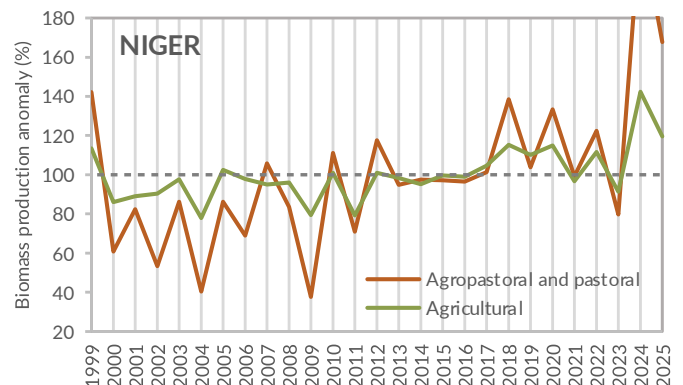
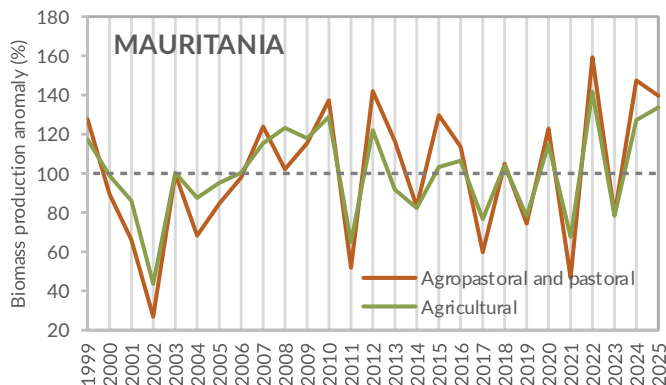
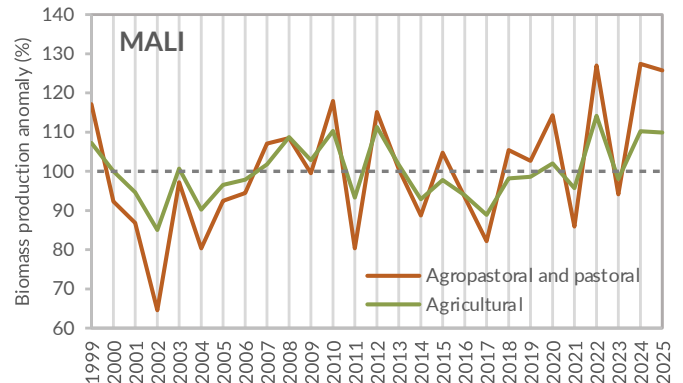
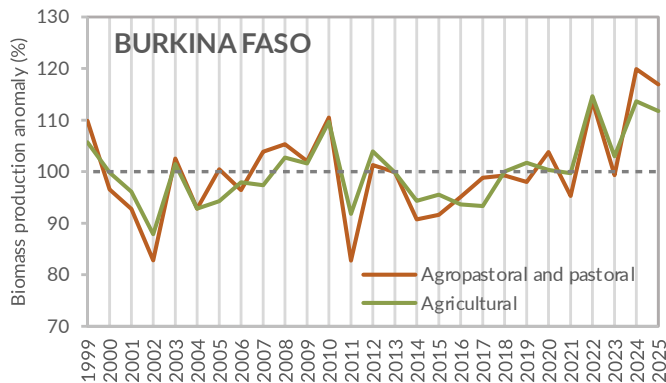


For these comparisons, the initial classes “agropastoral” and “pastoral” were grouped to obtain representative statistics for zones with a pastoral dominance.

The graphs show that in 2025, agropastoral and pastoral productions everywhere presented positive anomalies, always higher than those observed in agricultural zones further south.

Except in Senegal where production was around 110 %, all countries recorded a decrease compared to the previous year. The highest agropastoral and pastoral productions were recorded in Mali (+160 %), while the lowest were in Senegal. For agricultural zones, the best results were in Niger (130 %) and the weakest in Chad (105 %).

This situation is explained by the regional rainfall context, marked by fewer dry sequences compared to the previous year, as well as variability in the onset and end of the season depending on the zones.



COMPARISON OF 2025 WITH RECENT YEARS

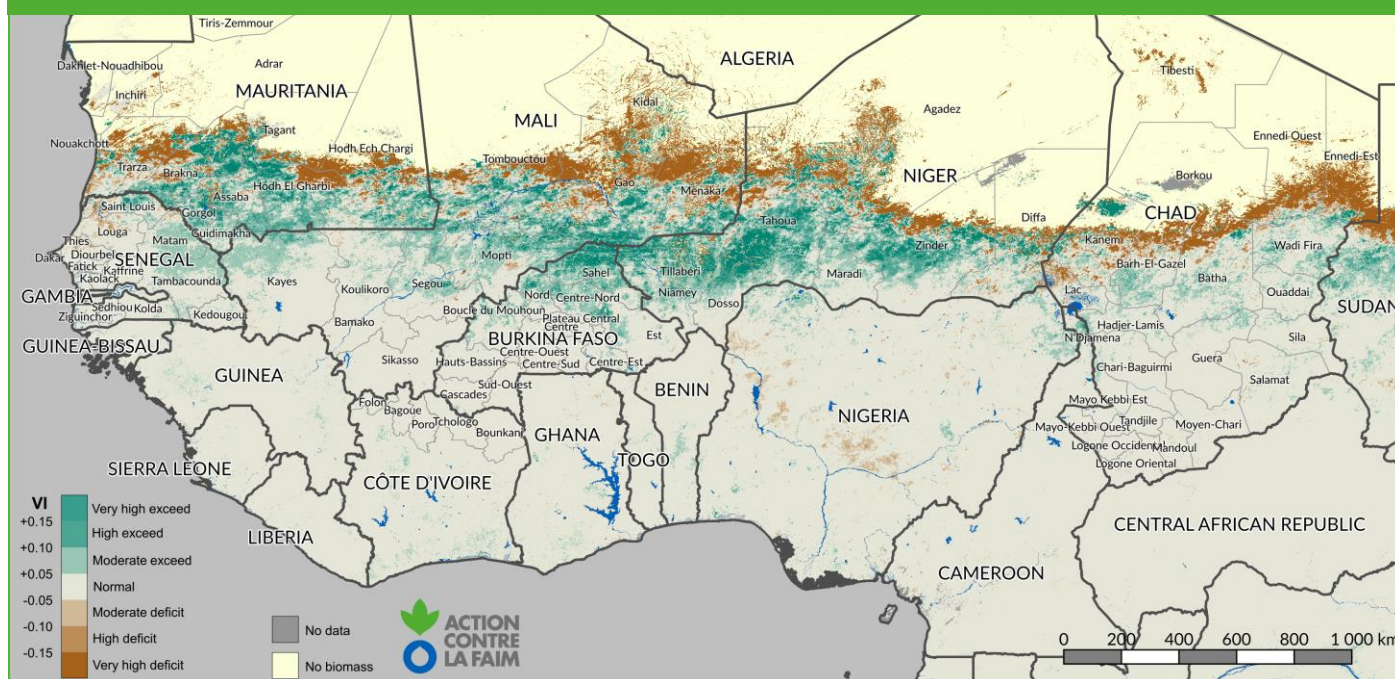
The vulnerability index (VI) related to biomass, represented by Map 5, is sensitive to production variations recorded over recent years and highlights areas experiencing repeated excesses.

Following the 2025 rainy season, herders' vulnerability remained low during the 2026 dry season, despite some local exceptions. Exposure to vulnerability reflects biomass production: the entire central Sahel is in a surplus situation, with “moderate

excesses” to “significant excesses.” In addition, northeastern Senegal and southern Mauritania recorded a surplus situation that will benefit herders in a context of restricted cross-border movements toward Mali.

At the regional scale, deficit zones were only observed on the northern limits of the Sahelian belt, which are of lesser interest to herders during the dry season.

MAP 5: BIOMASS VULNERABILITY INDEX 2025



The table below presents biomass production anomalies, expressed both in terms of standard deviations from the mean and as a percentage of it, according to agricultural and agropastoral livelihood zones in the six monitored countries. It highlights a

generally good to very good situation, despite some variations. However, production in 2025 was lower than in 2024, and certain agropastoral and pastoral zones, particularly those located in the north, appear vulnerable.

Countries	Livelihood zones	Anomaly 2021	Anomaly 2022	Anomaly 2023	Anomaly 2024	Anomaly 2025	VI 2025
Burkina Faso	Agricultural	-0.0σ (100%)	+2.2σ (115%)	+0.4σ (103%)	+2.0σ (114%)	+1.8σ (112%)	+0.02
	Agropastoral and Pastoral	-0.5σ (095%)	+1.5σ (114%)	-0.1σ (099%)	+2.2σ (120%)	+1.9σ (117%)	+0.05
Mali	Agricultural	-0.6σ (096%)	+1.9σ (114%)	-0.3σ (098%)	+1.4σ (110%)	+1.3σ (110%)	+0.02
	Agropastoral and Pastoral	-0.9σ (086%)	+1.7σ (127%)	-0.4σ (094%)	+1.7σ (127%)	+1.6σ (126%)	-0.04
Mauritania	Agricultural	-1.4σ (068%)	+1.8σ (142%)	-0.9σ (078%)	+1.2σ (127%)	+1.4σ (134%)	+0.07
	Agropastoral and Pastoral	-1.6σ (047%)	+1.7σ (159%)	-0.6σ (079%)	+1.4σ (147%)	+1.2σ (140%)	-0.05
Niger	Agricultural	-0.2σ (097%)	+0.8σ (112%)	-0.6σ (091%)	+3.1σ (142%)	+1.4σ (120%)	+0.01
	Agropastoral and Pastoral	-0.0σ (099%)	+0.6σ (122%)	-0.5σ (080%)	+3.2σ (228%)	+1.7σ (167%)	+0.01
Senegal	Agricultural	-0.9σ (091%)	+1.9σ (119%)	-0.4σ (096%)	+0.6σ (107%)	+1.0σ (110%)	+0.02
	Agropastoral and Pastoral	-1.0σ (087%)	+1.3σ (117%)	-0.6σ (092%)	+0.2σ (103%)	+0.8σ (111%)	+0.03
Chad	Agricultural	-1.3σ (090%)	+1.4σ (110%)	-0.8σ (094%)	+1.6σ (112%)	+0.6σ (105%)	+0.01
	Agropastoral and Pastoral	-0.1σ (098%)	+1.2σ (151%)	-0.8σ (065%)	+3.4σ (247%)	+1.0σ (143%)	-0.11

RAINFALL CONTEXT

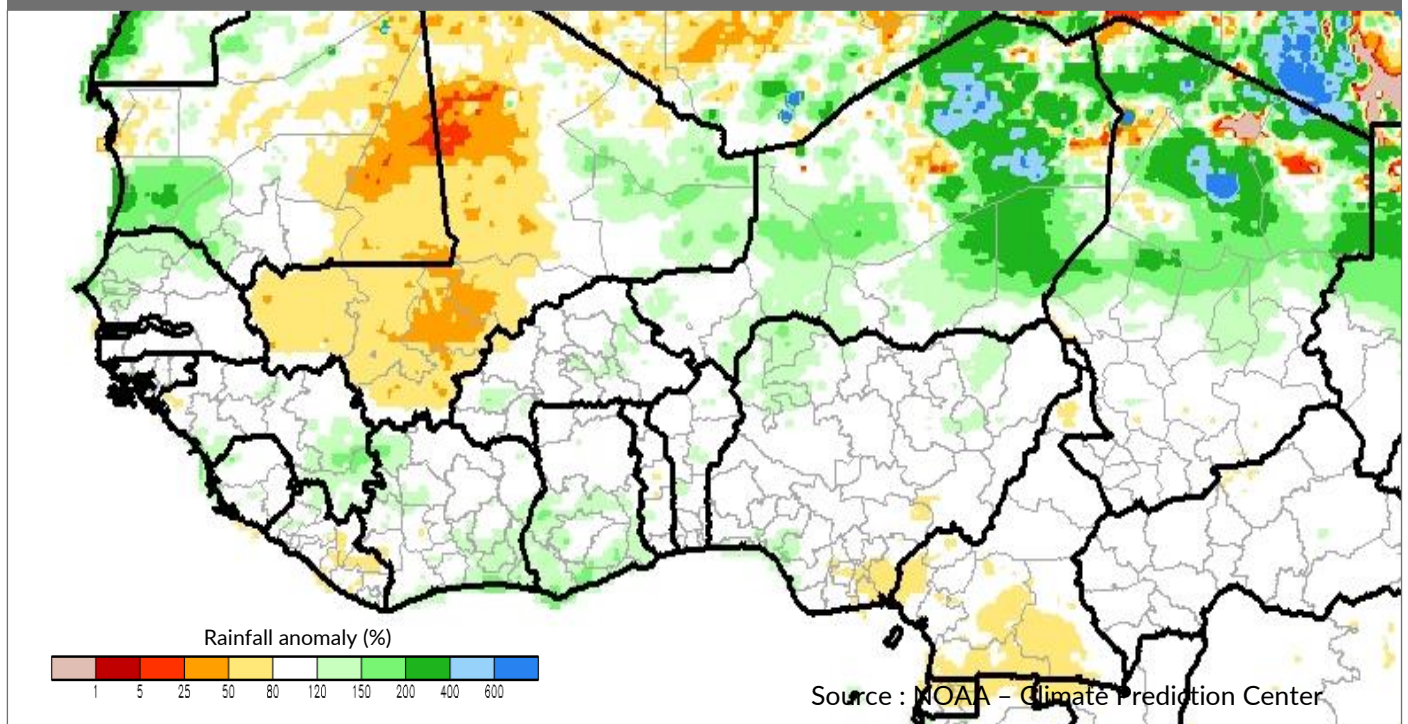
For West Africa and the Sahel, as in other semi-arid zones, water availability and the spatial-temporal distribution of rainfall are two determining factors in the annual biomass production balance.

Maps 6 and 7 show rainfall totals derived from satellite imagery for the 2025 rainy season. They come from two distinct sources: NOAA-Climate Prediction Center and the United States Geological Survey (USGS). Although their data may differ, they agree on general trends and provide an overall picture of the season's rainfall.

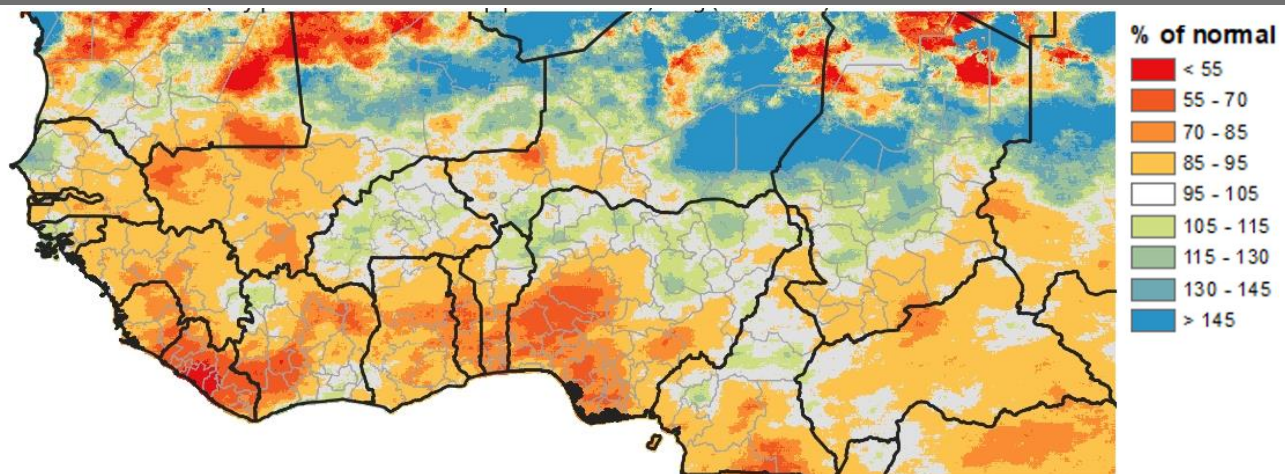
Rainfall totals in 2025 were generally normal to above average in Sahel countries but below average in Gulf of Guinea countries. This season was characterized both by exceptional rainfall in the Sahel and poor temporal distribution of rains, particularly in Gulf of Guinea countries.

River flows were above the 1991-2020 average in most basins. In some cases, such as the middle Niger basin and the Senegal basin, alert thresholds were exceeded, causing localized flooding.

MAP 6: RAINFALL ANOMALIES MAY-OCTOBER 2025 (NOAA-CPC)



MAP 7: RAINFALL ANOMALIES MAY-SEPTEMBER 2025 (USGS)



Map produced by USGS/EROS



CONCLUSION

WINTERING SEASON 2025

The 2025 rainy season was rainy to very rainy in the Sahelian zone, particularly in the centre. Rainfall was average to low in the rest of the region, especially on the western façade and in Gulf of Guinea countries.

Biomass production was generally satisfactory in Sahelian, Sudano-Guinean, and Guinean zones, despite localized deficits notably on the Atlantic façade of Senegal and Mauritania and in the Lake Chad basin. Across the Sahel, although production was above the 25-year average, 2025 remained below 2024, which had been exceptional.

In coastal countries, biomass production remained below average this year but improved compared to the previous year

OUTLOOK FOR 2026

Following the 2025 rainy season, the balance of forage resources is generally good, despite some disparities. The challenges now lie more in accessibility and utilization. Four main areas emerge for the 2026 dry season in relation to the evolving context:

- **Mali-Mauritania-Senegal corridor:** Biomass production is sufficient despite localized deficits in the western part. Vulnerability related to resource availability during the dry season remains limited. However, insecurity reduces complementarities in the area. The ban on transhumance between Mauritania and Mali causes significant concentrations and increased pressure on resources. An early and difficult pastoral lean season is expected.
- **Central Sahel:** Biomass production is sufficient, and the vulnerability index (VI) shows surplus. However, the security context limits prospects for better utilization. The ban on cross-border transhumance toward several coastal countries, formerly host areas, makes the season uncertain.

Overall, these biomass productions were sufficient to ensure pasture availability. However, regional disparities and restrictions on livestock mobility, combined with high animal concentrations, favored overgrazing, which may reduce pasture potential and worsen the lean season.

In 2025, the rapid alternation between very rainy years (2020, 2022, 2024) and less rainy years (2021, 2023) was once again confirmed. Nevertheless, although 2025 was rainy, it remained below 2024, which was exceptionally rainy.

- **Central corridor zone (southern Sahelian countries and northern coastal countries):** Resources are sufficient across the zone. In addition to growing insecurity, the ban on cross-border transhumance also limits geographic complementarities that previously characterized the zone, exposing herders further.
- **Lake Chad basin:** Resources are average to sufficient despite very pronounced deficits. Herders, increasingly accustomed to the insecurity context, will rely on transhumance to exploit available resources. The pastoral lean season could be early and severe in some areas.

At the regional scale, the political and security situation strongly influences resource management and exploitation. On one hand, access is regulated; on the other, actors are organizing. In the perspective of a dry season rather favorable to herders, it is essential to identify priority sectors and action zones.

RECOMMENDATIONS

- Follow the general recommendations in favour of pastoral and agropastoral sectors:
 - Sahelian agrarian system
 - Facilitate pastoral mobility, particularly cross border transhumance
 - Develop services for herders and livestock (animal health, vaccination, etc.)
 - Improve pastoral infrastructure, which should be considered priorities for the stability and socio-economic development of the countries
- Establish monitoring of pasture stock throughout the dry season and monitor the impact of bushfires
- Facilitate transhumance, particularly cross border transhumance, to reduce the vulnerability of pastoral communities facing biomass production deficits and persistent insecurity
- Set up an anticipation and rapid intervention mechanism for agropastoral communities in the tri border region
- Adapt support for displaced persons to their livelihoods
- Integrate support for the pastoral sector into the core of intervention strategies in the sub region
- Operationalize the regional livestock feed reserve
- Strengthen the capacities of national agency staff in the use of new technologies, particularly GIS, for monitoring pastoral conditions
- Identify and monitor the main reception areas, especially those hosting displaced persons with livestock

The data used for the calculation of biomass production comes from the data generated by the COPERNICUS land service, the European Commission's Earth observation programme. The research that led to the current version of the product was funded by various European Commission research and technical development programmes. The product is based on data from the SENTINEL-3, PROBA-V and SPOT-VEGETATION satellites of the European Space Agency ESA.

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