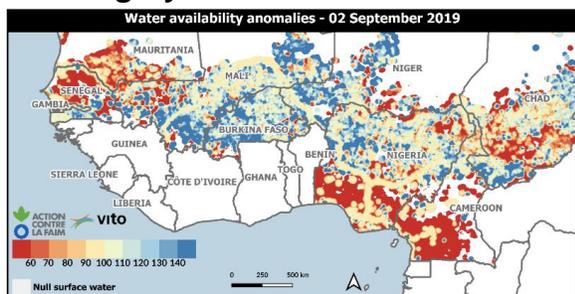


Scale-up of the Pastoral Early Warning System in the Sahel



Summary:

The West African Sahel consistently faces climate shocks. However, early predictions of drought can allow sufficient time for pastoral herders to prepare and implement adequate responses. In 2018-2019, the Data Innovation Fund supported the scale-up of a Pastoral Early Warning System (PEWS), developed by Action contre la Faim (ACF), which began to regularly track drought in West Africa in 2010 using satellite images and geospatial technologies and later added data collected from sentinel sites on the ground.

The current PEWS incorporates two sets of data that are complementary. The first is near-real-time data collected from the field as SMS/Phone surveys about livestock conditions in 107 “sentinel sites” in Burkina Faso, Mali, Niger, and Senegal. The second is satellite images used to generate biomass and surface water productions and accessibility.

The outputs of this pastoral drought monitoring system are interactive maps, graphs, and time series that are available on the website (www.geosahel.info) designed for their visualization and queries.

In addition, bi-monthly reports and alerts are

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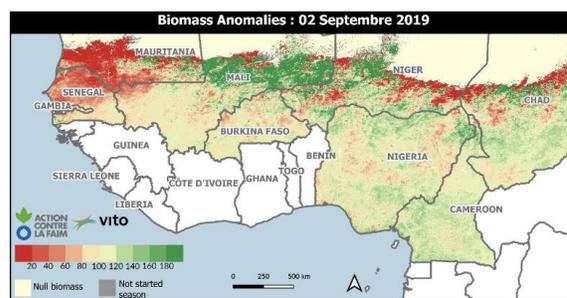
For more information please visit the TFSCB website here or email: data@worldbank.org

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published on another website (www.sigsahel.info). These bulletins or reports are also distributed through a mailing list to key stakeholders in these countries, as well as to regional and international humanitarian organizations.

Data Innovation:

Sentinel sites provide accurate and timely information to humanitarian and state actors. In Senegal, information is also provided to pastoral civil society organizations and communities. This data includes indicators on pasture and water availability, market prices, herd movements, security issues, and animal health. Before this project, this kind of data did not exist at all in Senegal. At this time, ACF is the only organization offering real-time information on pastoral conditions. ACF has developed an automated system that produces data and maps every 10 days about the state of water and biomass in the Sahel.



This is a unique dataset of its kind especially with regards to its geographic coverage, the near real-time of the dataset, and its free access by any user with an internet connection. Users can download the data in a raster (gridded) or CSV (tabular) format for individual areas of interest (e.g., country, region, and department/province levels)

This data has been a key element used to trigger a humanitarian response in multiple countries. The automatic update of the data has allowed for

analyses to be generated faster than ever, and thus allow response plans to begin earlier than before.

At a Glance:

SDGs: 1. No poverty, 2. Zero hunger, 3. Good health and well-being, 8. Decent work and economic growth, 15. Life on land

Project Objective: 1) Expansion of field data coverage across the Sahel and, 2) Improvement of satellite data processing and outputs by automating data treatment, publishing the codebase, and making raw data accessible to all.

Geography: Burkina Faso, Senegal, Mali, Niger

Data Types: Satellite imageries, spatial georeferenced data, automatic field data as SMS.

Technologies: Remote sensing, Geographic Information Systems, ODK.

Lessons Learned:

Satellite Imagery Analysis:

- The temporal & spatial resolution of satellite imagery needs to be balanced. For example, 10m spatial resolution sentinel data are only available every 5 days, which may not be enough to have a cloud-free image on a recurrent basis during the rainy season.
- Data should be kept on a server to ease automation.

Field Data Collection:

- Simple indicators should be used to guarantee sustainability and ensure the continuation of data collection.
- Qualitative data, such as data collected in the field, are key and it is important to understand the context behind earth observation data.

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- It is also important to increase awareness about the system among the user communities, to ease the perceived technical barriers and tailor the information in an easy-to-understand format.

Results:

The scale-up of the project had two principal aims: (i) Expansion of field data, and (ii) Improvement of satellite data outputs by automating data treatment, publishing the codebase, and making raw data accessible to all. Both goals were achieved. The number of sentinel sites increased from 50 to 107 in 4 countries (Mali, Niger, Senegal, and Burkina Faso). This considerably improved the monitoring coverage over the Sahelian region and the accuracy of the data.

ACF published 36 bi-monthly national bulletins on the pastoral situation (9 bulletins x 4 countries). The satellite data outputs also improved with the whole imagery treatment being automatic, the codebase published on GitHub, and all data (both satellite-derived products and field data) are freely accessible from the web platform (www.geosahel.info).

References:

www.geosahel.info

www.sigsahel.info

[Action contre la Faim en Afrique de l'Ouest](#)

[ACF-WARO/BioHydroGenerator](#)

[Early warnings, late response to Senegal's food crisis](#)

[Satellite data shows hunger looming in Senegal](#)
[Changement climatique et pression démographique, terreau de la violence au Sahel](#)