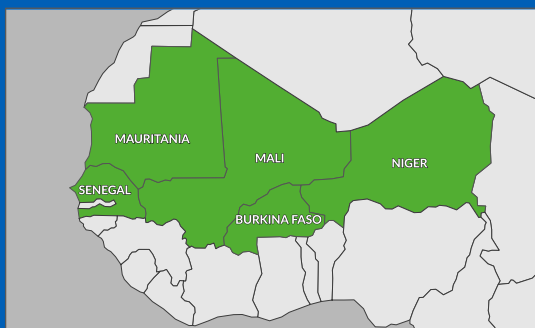# PASTORAL SURVEILLANCE AND EARLY WARNING SYSTEM

INNOVATION IN EARLY WARNING AND MONITORING: COMBINING REMOTE SENSING AND COMMUNITY-BASED APPROACHES FOR PASTORALISM IN THE SAHEL

PROJECT DURATION
Since 2007

AREA OF INTERVENTION
5 West African countries

MAURITANIA
MALI
NIGER
SENEGAL
BURKINA FASO

CURRENT REGIONAL AND INTERNATIONAL PARTNERSHIPS
Réseau Billital Maroobé RBM, Vétérinaires sans Frontières Belgium VSF-B, Flemish Institute of Technology VITO, Terre des hommes Lausanne Tdh-L, Ministries of Livestock, NASA, University of Maryland

MAIN DONORS
Fondation Prince Albert II de Monaco, Enabel, European Commission, World Bank, USAID, World Food Program, Fondation Action contre la Faim pour la recherche, Azione contro la Fame

REQUIRED OPERATIONAL BUDGET
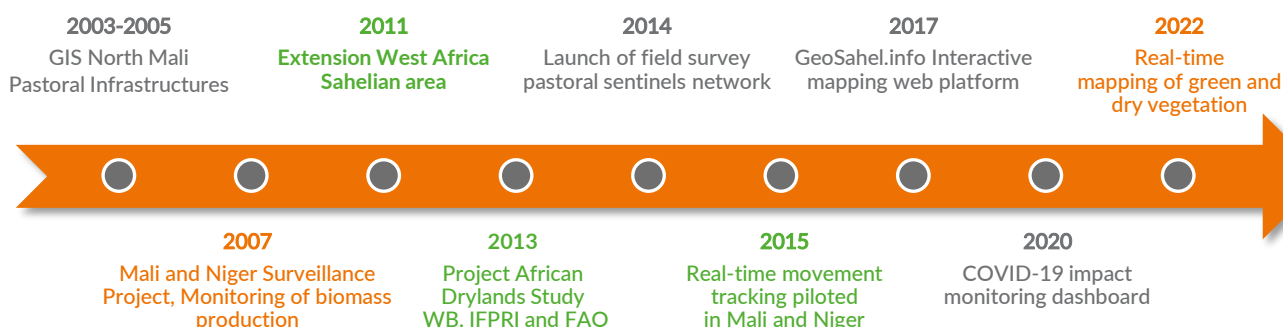250 000 € / year

SUMMARY ▶

The PEWS pastoral surveillance and early warning system has been developed since 2007 and implemented in the Sahelian context of West Africa where pastoralism and pastoral mobility are one of the keys to environmental and economic resilience.

The approach aims to monitor pastoral resources based on satellite images complemented by field data collection and combines two concepts: early warning and surveillance. Early warning is based on the evaluation of biomass production during the rainy season, allowing the anticipation of the stock of pasture that will be available during the next dry season. Surveillance is done through real-time monitoring of green and dry vegetation by remote sensing and a network of field agents, called pastoral sentinels, who provide information on the pastoral situation at the local scale several times a month.

The information produced is used to anticipate the needs of agropastoral communities during the pastoral lean season and to mobilise resources to meet the most acute needs. The information is also used by herders' and pastoralists' networks to adapt their practices and conduct their own advocacy at local, national and regional levels.

HISTORICAL DEVELOPMENTS ▶

2003-2005
GIS North Mali Pastoral Infrastructures

2011
Extension West Africa Sahelian area

2014
Launch of field survey pastoral sentinels network

2017
GeoSahel.info Interactive mapping web platform

2022
Real-time mapping of green and dry vegetation

2007
Mali and Niger Surveillance Project, Monitoring of biomass production

2013
Project African Drylands Study WB, IFPRI and FAO

2015
Real-time movement tracking piloted in Mali and Niger

2020
COVID-19 impact monitoring dashboard

METHODOLOGY ▶

1

ANALYSIS OF REMOTE SENSING DATA

The processing chains developed by ACF are able to produce estimates of pasture availability in the Sahel throughout the year.

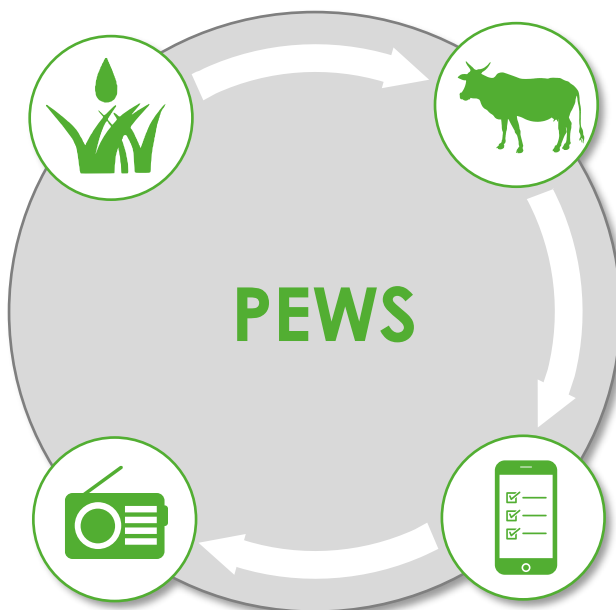The data from these analyses is an essential indicator for planning humanitarian responses.

2

COLLABORATION WITH PASTORAL COMMUNITIES

A fundamental element of this project is the involvement of pastoralist communities.

The technical partnership with the Réseau Billital Maroobé RBM, an international association of Sahelian pastoralists, has enabled the development of common monitoring and advocacy tools adapted to the needs of pastoral communities, in particular for the diagnosis of risk and vulnerability to disasters.

At the local level, ACF relies on Participatory Vulnerability and Capacity Assessment (PVCA), an investigative method that uses a variety of qualitative participatory tools to involve local actors.

PEWS

4

DISSEMINATION OF INFORMATION

Information and analysis are shared with pastoralists to strengthen their capacity to respond to crises.

Regularly updated messages in local languages are disseminated to provide pastoral communities with information and good livestock practices.

Dissemination also takes place at the level of national coordination authorities (SAP, food security cluster) and during *Cadre Harmonisé* (CH) workshops, and at the regional level during meetings of the Food Crisis Prevention and Management (PREGEC) and Food Crisis Prevention Network (RPCA).

3

REAL-TIME FIELD DATA COLLECTION

To improve the speed and efficiency of information collection, ACF engages in remote data collection on pastoral resources through a network of pastoralists called pastoral sentinels. This information is collected and validated alongside national actors from the Ministry of Livestock and uses low-cost tools via mobile phones. These systems allow rapid and accurate mapping of the pastoral situation.

PRODUCT EXAMPLE ▶
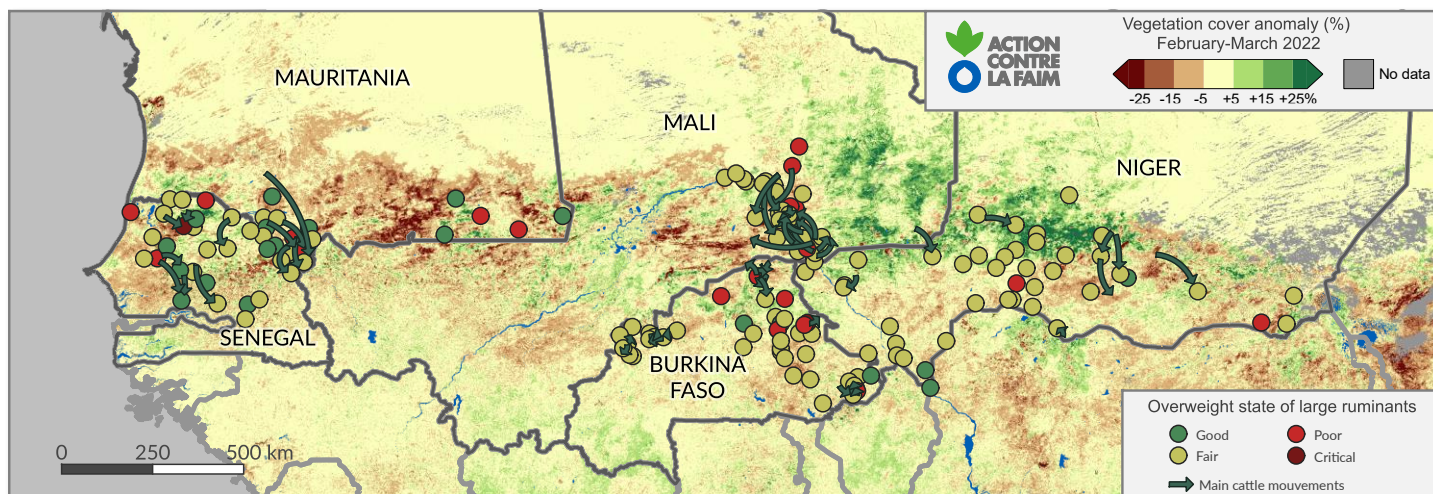
BACKGROUND MAP – The background map represents the vegetation cover anomaly, including green (photoactive) and dry (non-photoactive) vegetation for the period February-March 2022 in the dry season, compared to the average value observed over the same period during the years 2001-2022. This map is derived from the RAPP (Rangeland and Pasture Productivity) products at the initiative of GEOGLAM (Group on Earth Observations and its Global Agricultural Monitoring), based on MODIS (Moderate-Resolution Imaging Spectroradiometer) acquisitions, and allows to visualise in real time the areas with a deficit or sufficient pasture.

LOCAL DATA – The state of overweight of the animals as well as the main movements of the cattle are among the information reported by the pastoral sentinels. During the dry season, corresponding to the pastoral lean season, it is usual for the state of overweight of the animals to deteriorate, but a critical level becomes alarming. During the dry season, there is a transhumance of herders towards the south in search of pastoral water and grazing resources. Other local movements are mainly due to growing insecurity in some areas.

BENEFICIARIES ▶

DIRECT BENEFICIARIES – Regional and national partners including pastoralist organisations and ministries of animal resources in the 5 intervention countries, pastoralists in the areas covered by the local radio programmes.

INDIRECT BENEFICIARIES AND OTHER USERS – The food and nutrition crisis prevention network, governments, UN agencies, donors, technical working groups and clusters at regional and national level, academics interested in pastoralism and animal resources.

FUTURE TECHNICAL DEVELOPMENTS ▶

MONITORING OF WATER POINTS AND BUSHFIRES –
The use of remote sensing derivate products distributed by the European Copernicus Global Land Service can provide real-time visualization of the presence of surface water and fires. A seasonal prediction model of the filling rate of ponds and watering holes of pastoral interest, being developed by the University of Maryland and NASA, can help anticipate water availability.

IMPROVING THE EARLY WARNING SYSTEM –
A system for monitoring and predicting the humanitarian vulnerability of pastoral and agropastoral populations in the western Sahel based on GIS analysis and Artificial Intelligence is being developed in collaboration with the University of Granada, the GIS4Tech research laboratory and ACF.

PASTONAVIGATOR –
This smartphone application will allow access to geo-located and real-time updated information on the presence of vegetation, surface water and fires. Information from pastoralist sentinels, among them the market prices, water accessibility, presence of diseases or conflicts, will also be accessible.
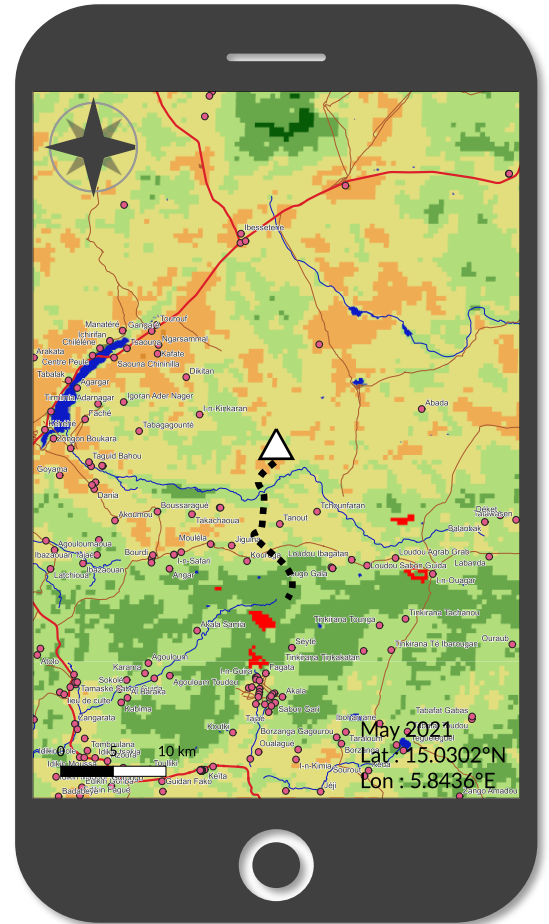
CONTACTS ▶

Action Against Hunger - ACF

Erwann FILLOL
Surveillance and Data Analysis
Regional Advisor
Regional Office for West and Central Africa
erfillol@wa.acfspain.org

Web portal
sigsahel.info

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