



ACTION  
AGAINST  
HUNGER



ACTION  
CONTRE  
LA FAIM

# Open-source GIS and early warning for nomadic herders

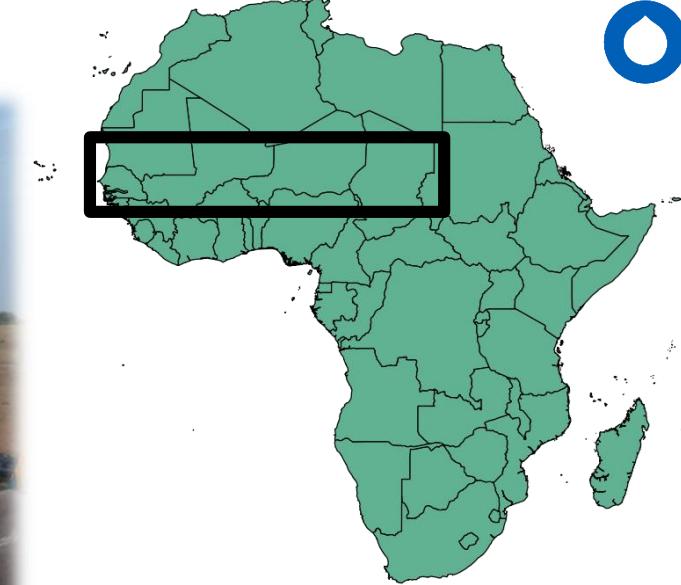
Alex Merkovic-Orenstein

West Africa Disaster Risk Reduction Advisor

Action Against Hunger

[www.sigsahel.info](http://www.sigsahel.info)

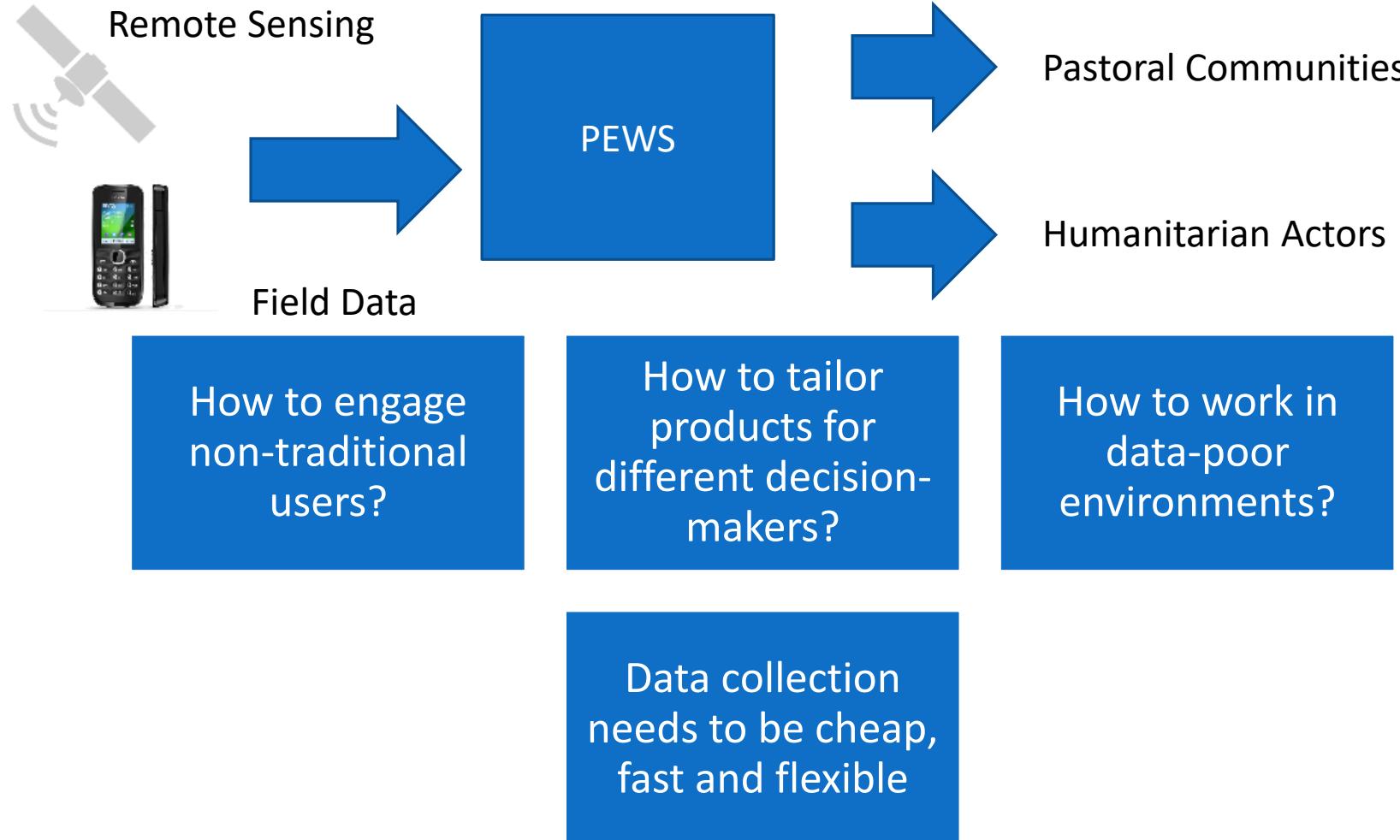
# Pastoral Surveillance



Wet season

Dry season

# Pastoral Early Warning System



# 1- Biomass Monitoring

**Biomass:** Kilograms of Dry Matter per hectare.

- Dry matter: Above-ground plant mass without water content.

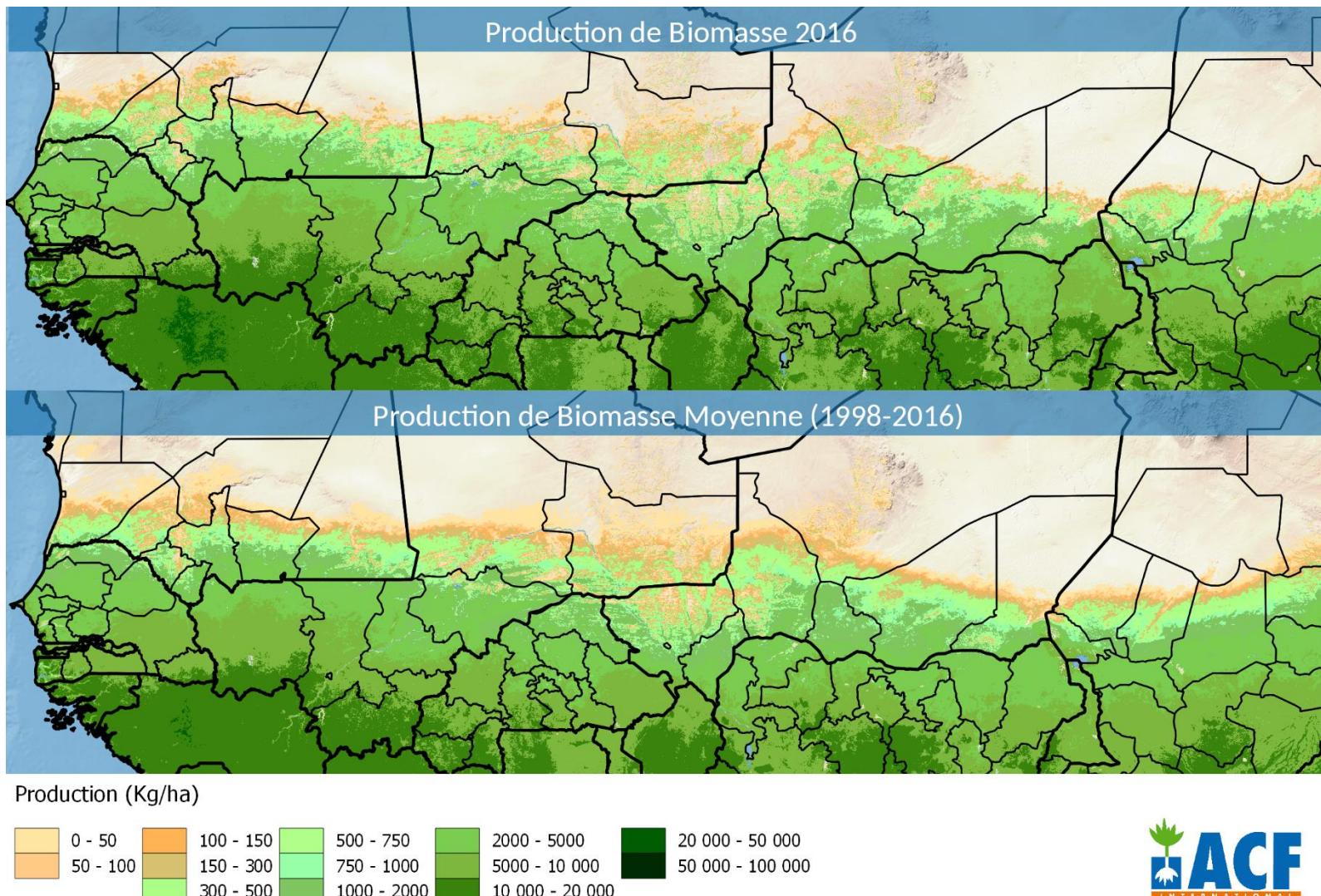
**End of the rainy season (July-Oct) to measure full production of biomass**

- Offers a prediction on incoming dry season conditions

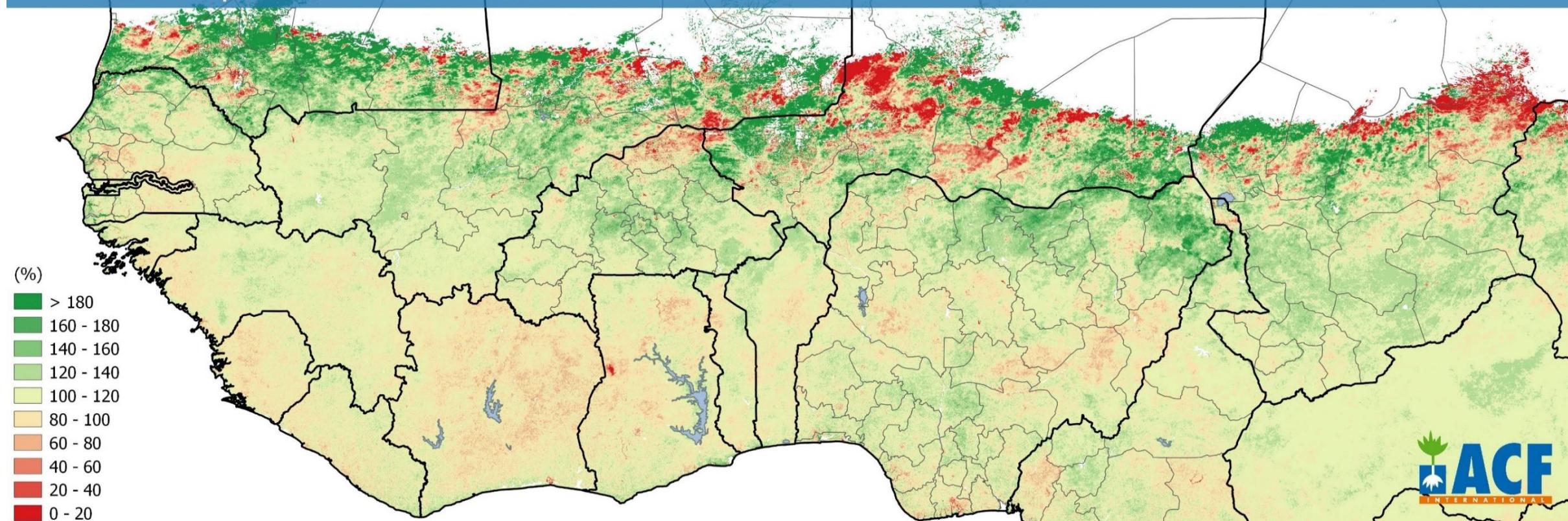
**Used as a proxy for measuring pasture resources.**

**Datasets**

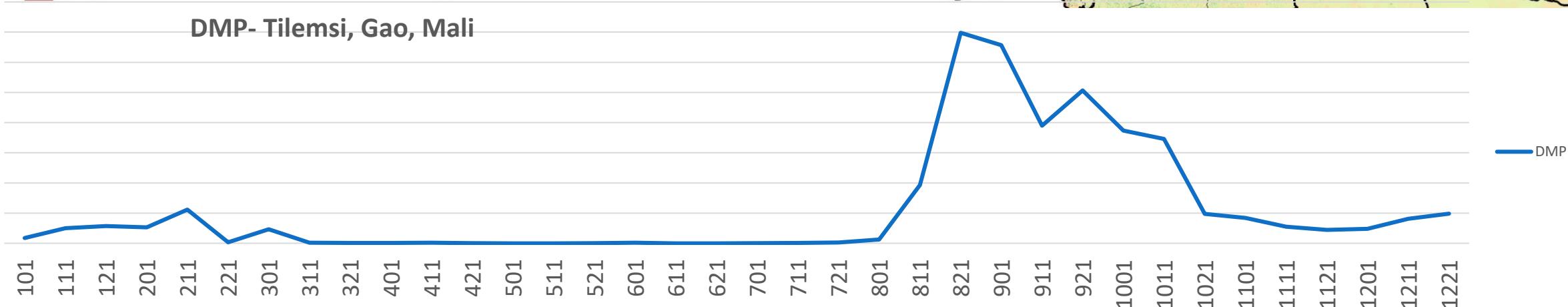
- Production
- Anomaly (vs mean)
- Anomaly Standard Deviation
- Long term trend (1998-2016)
- Vulnerability Index (recursive indicator that looks for recurring droughts)



# Anomalie de la production de Biomasse au 01 Octobre 2016

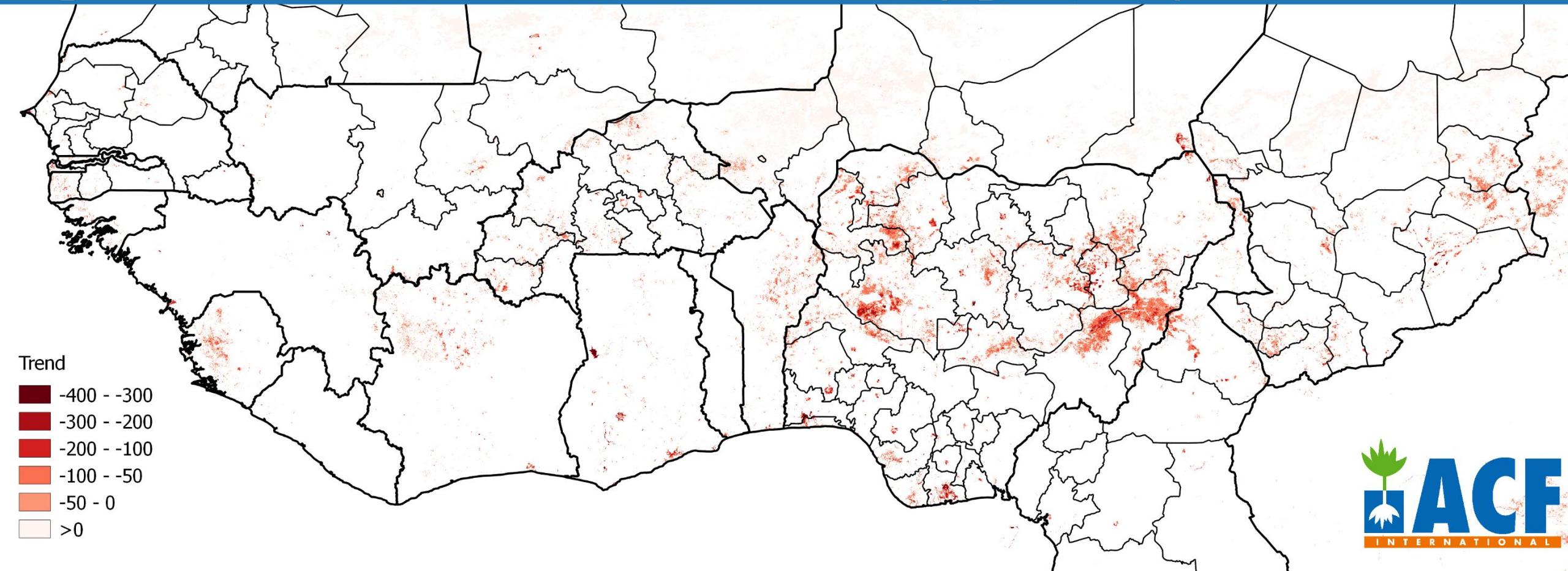


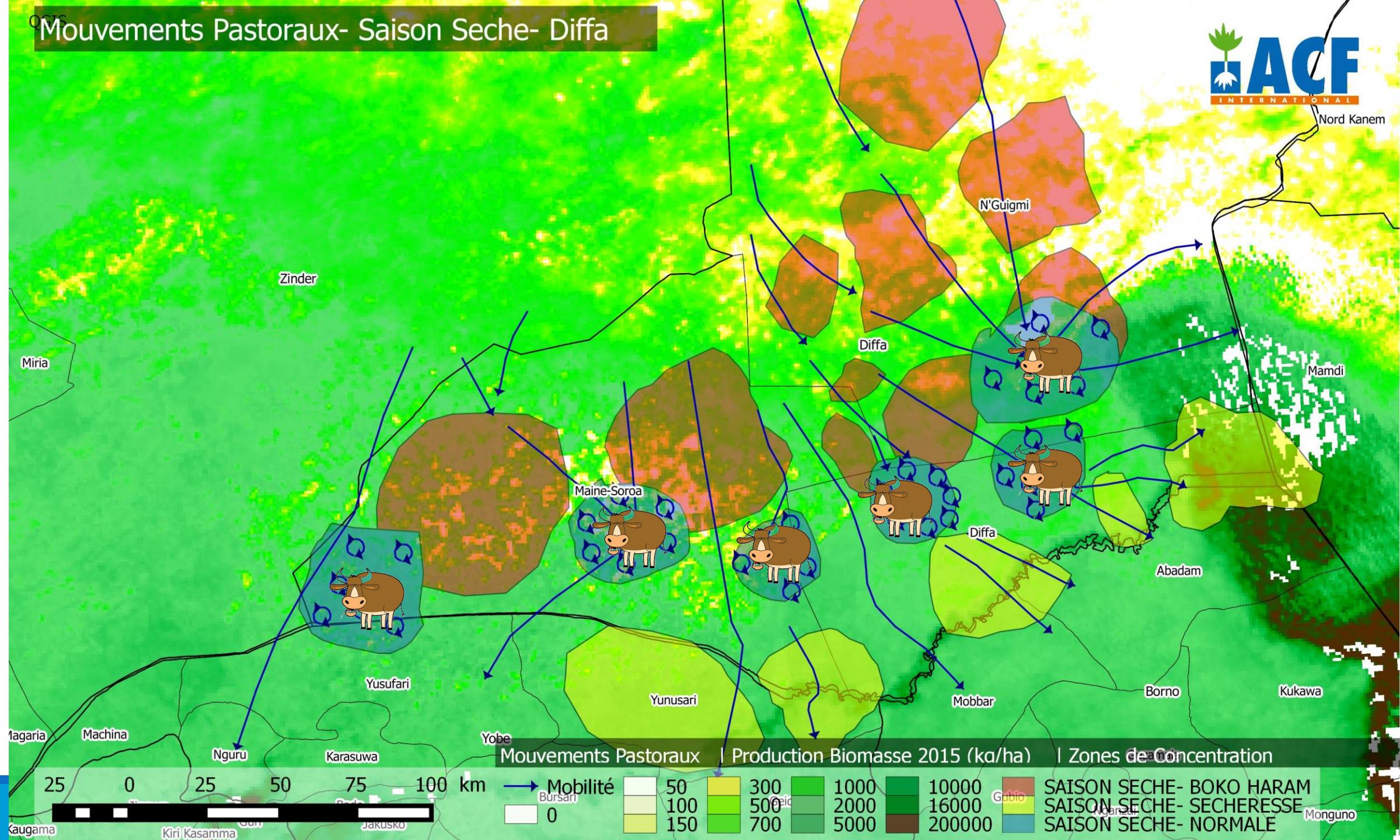
DMP- Tilemsi, Gao, Mali



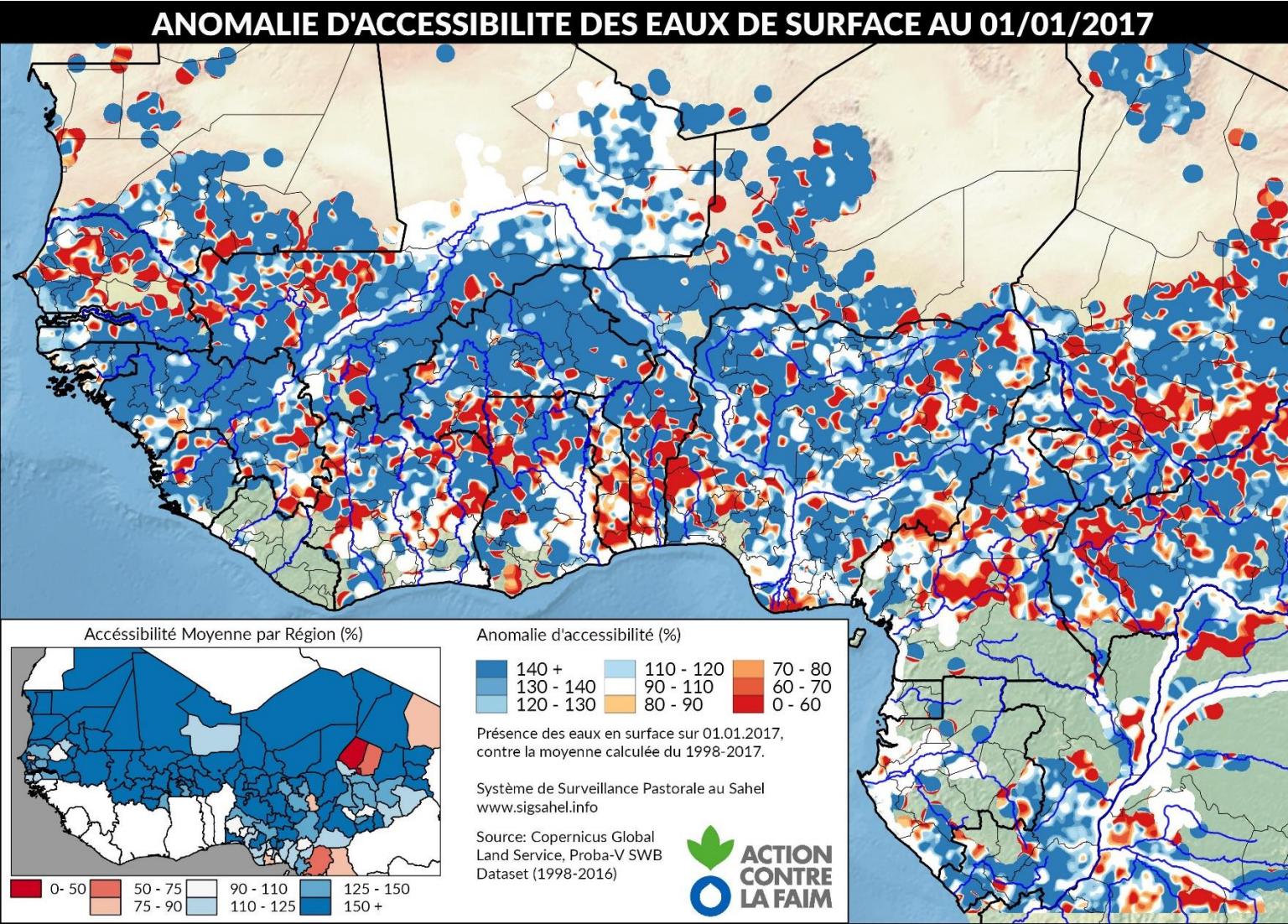
# Trend

## Negative Biomass Production Trend 1998-2016 (Kg/Ha/Year)

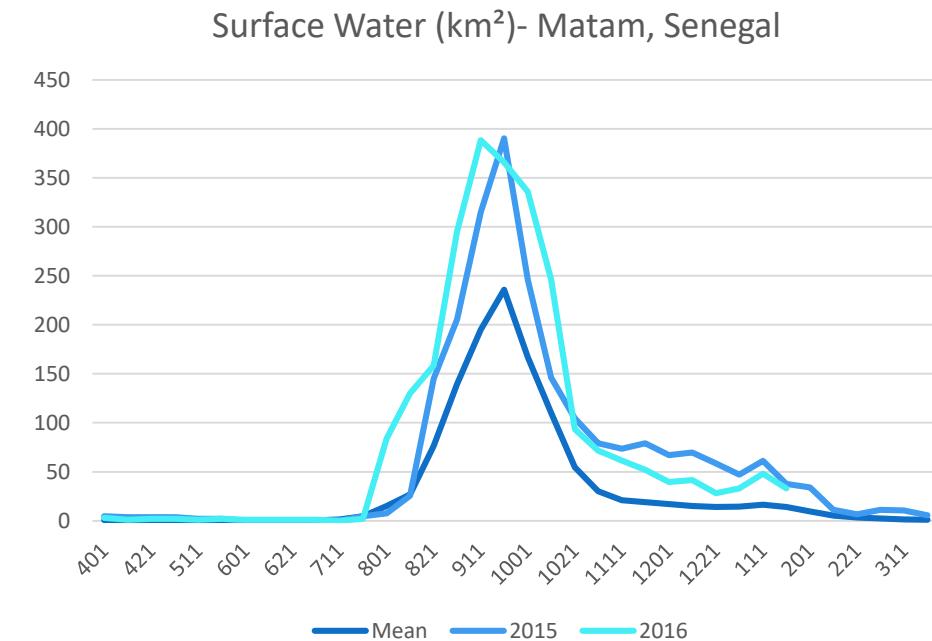




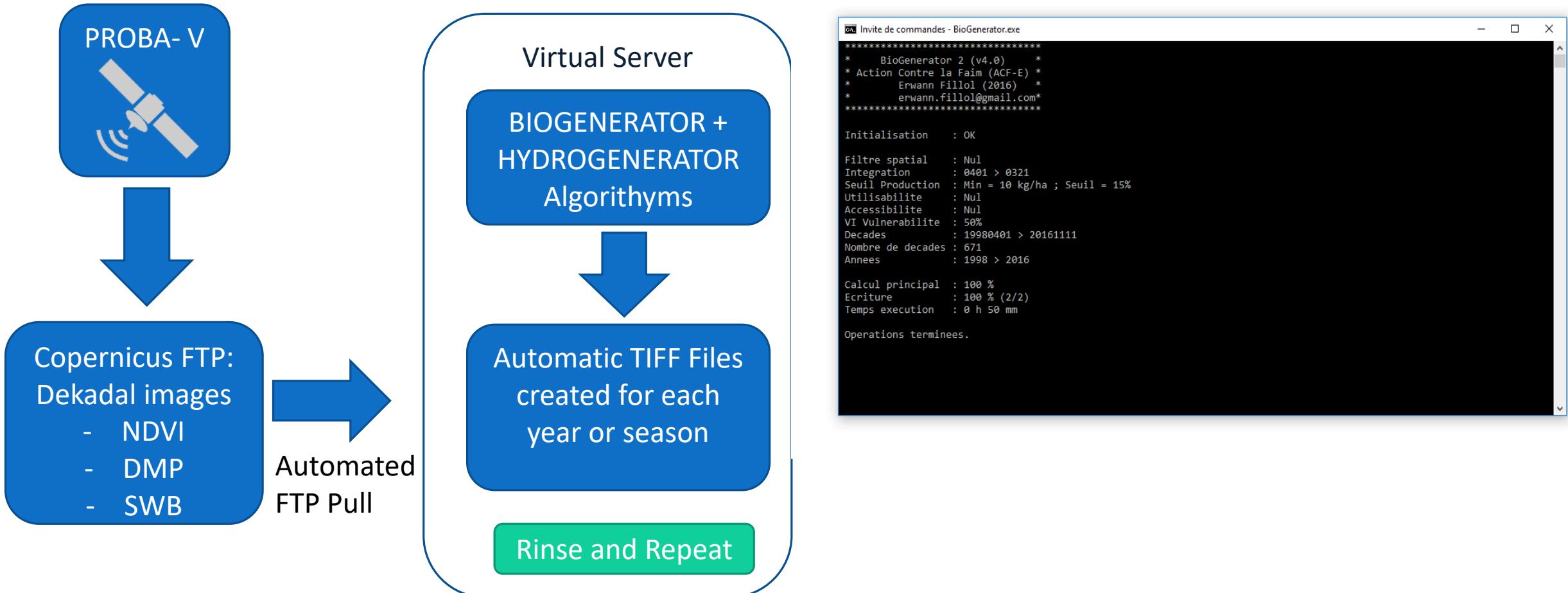
# 2- Monitoring Surface Water



Can be done during the dry season!  
Unlike Biomass measurement



# How does it work?



# Field Data- For everything you can't see from space



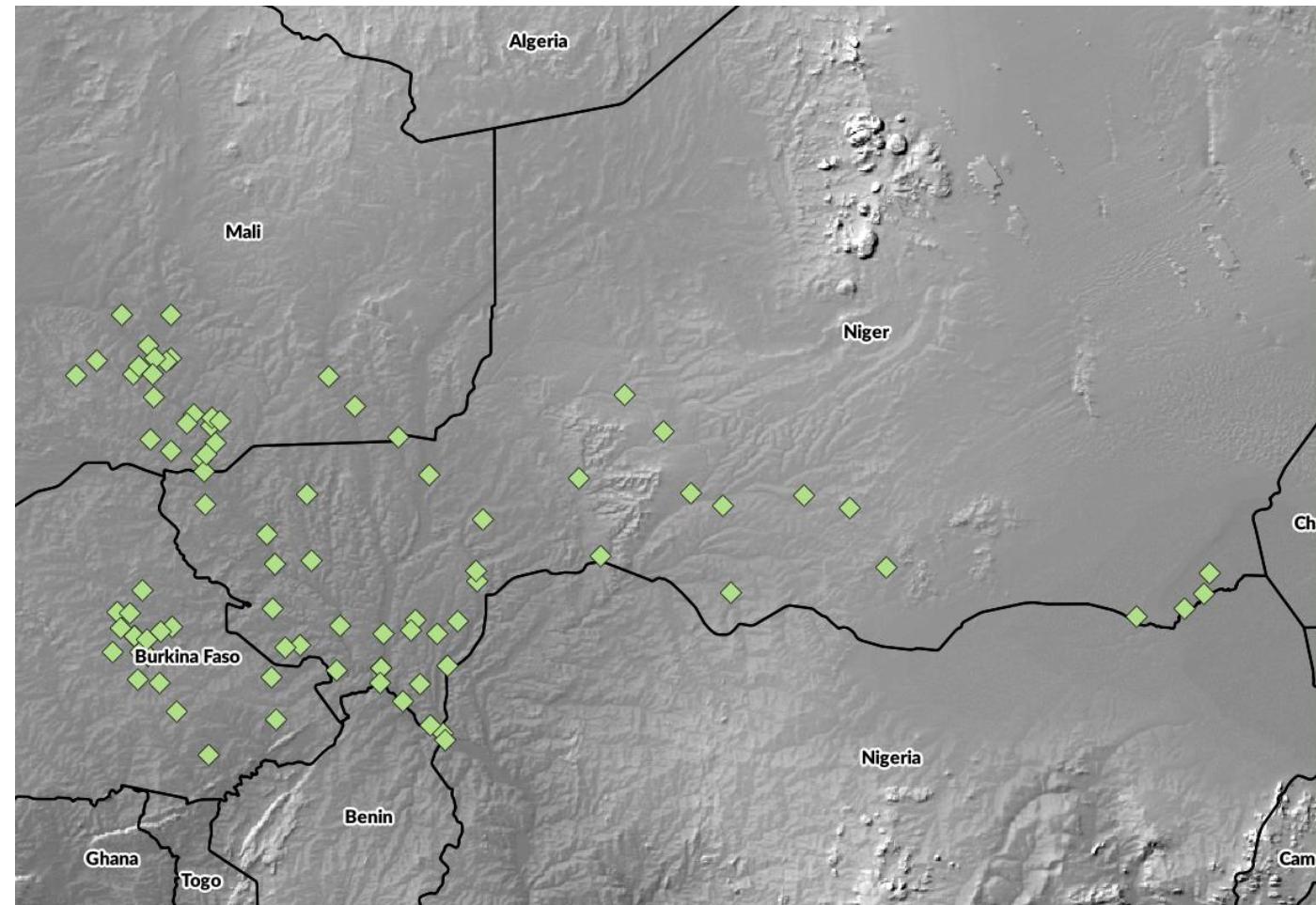
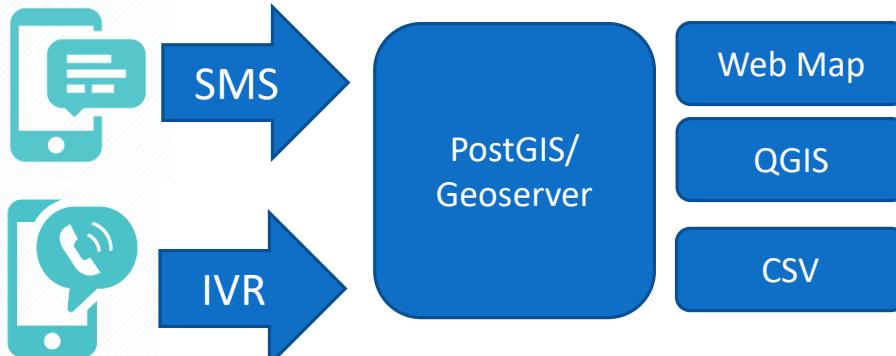
SMS/IVR

Weekly Surveys

- Pasture Availability
- Water Availability
- Terms of Trade
- Animal Diseases
- Brush Fires

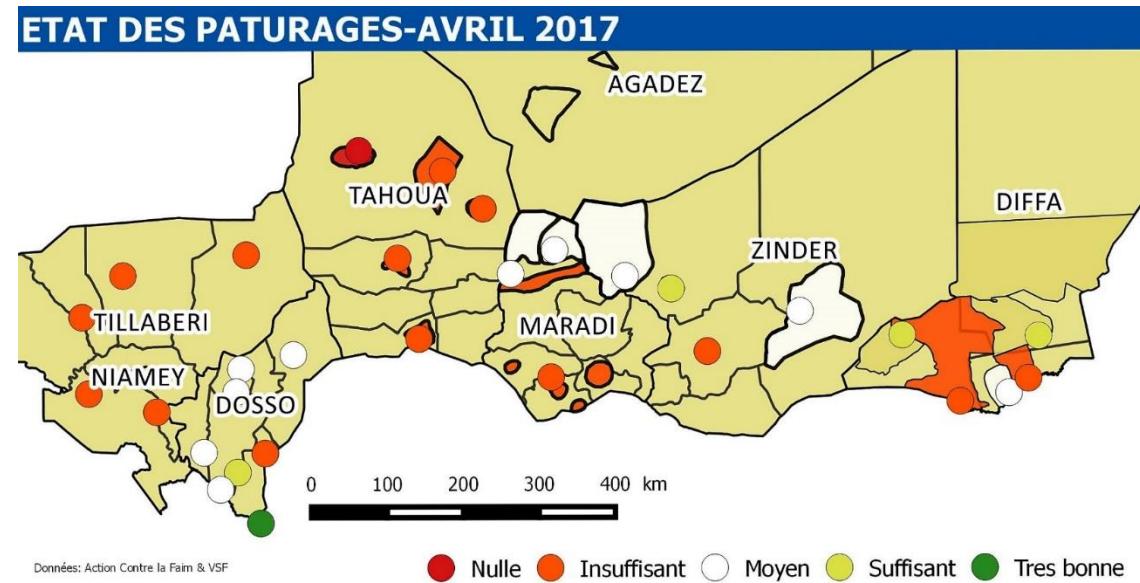
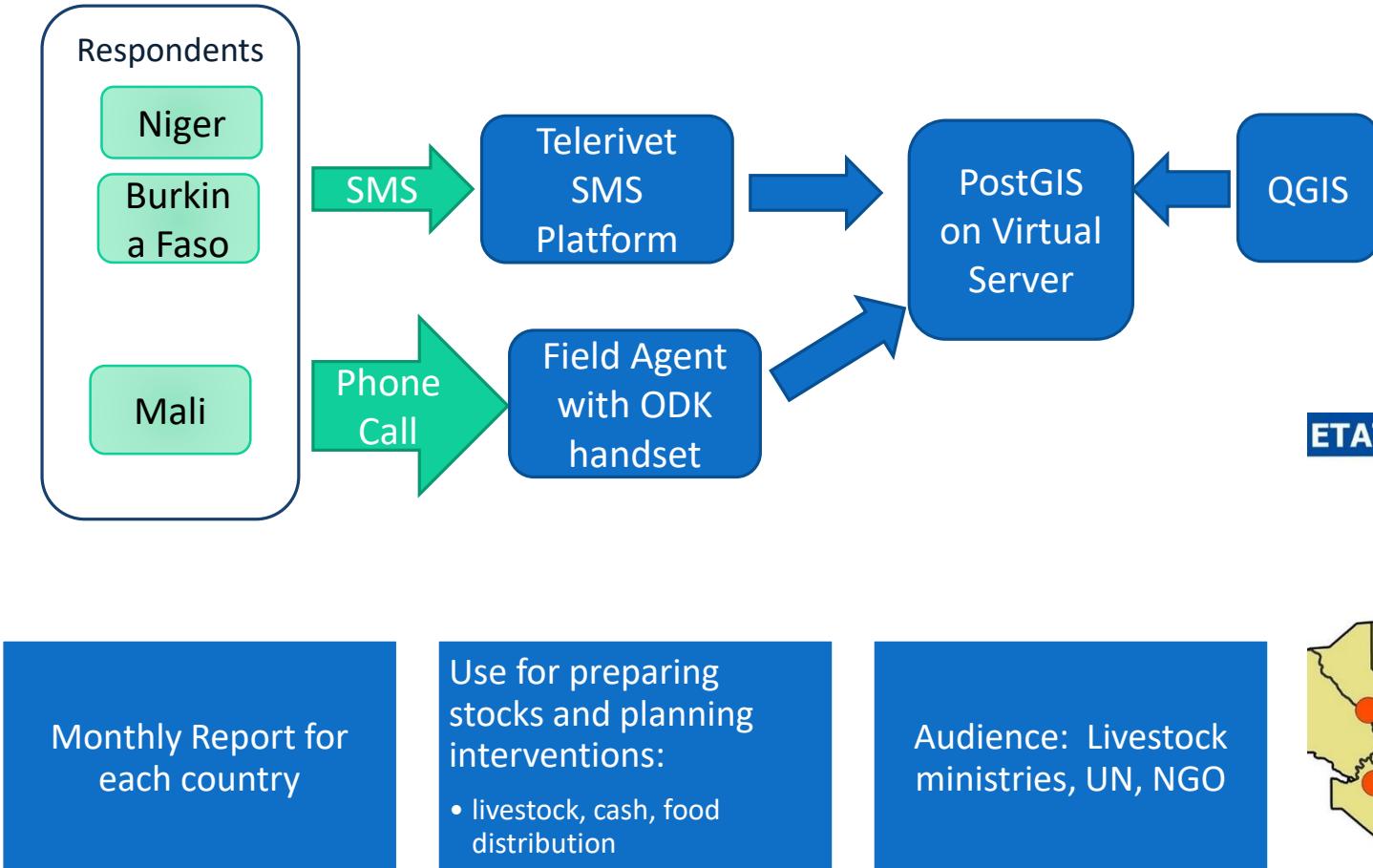
Transhumant Movements

- Seasonal Workshops

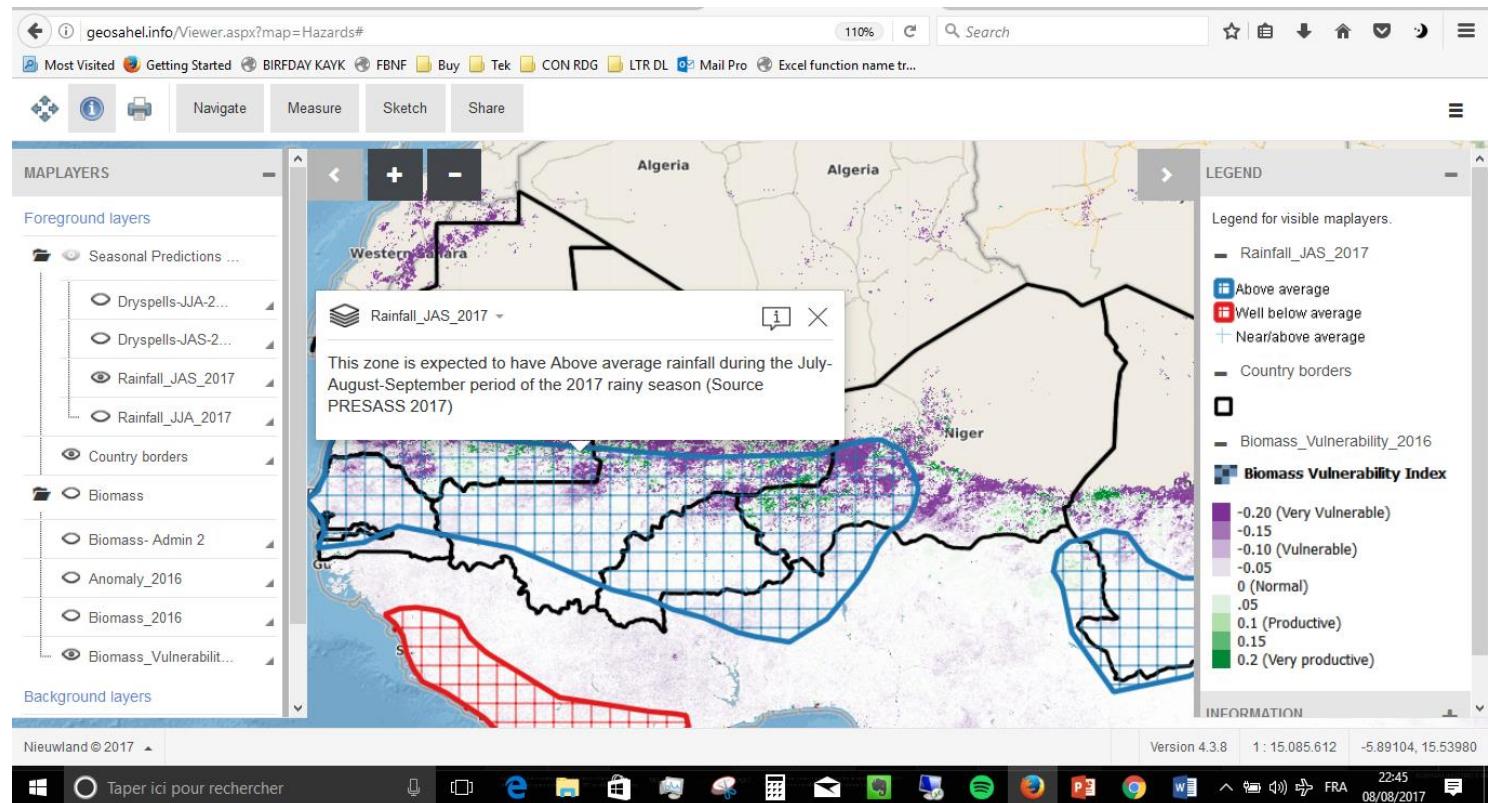


Surveillance Field Sites- Weekly Collection

# How it works – Field Data



# GeoSahel.info



Established protocol for creating vector or raster data in QGIS



Upload to Geoserver

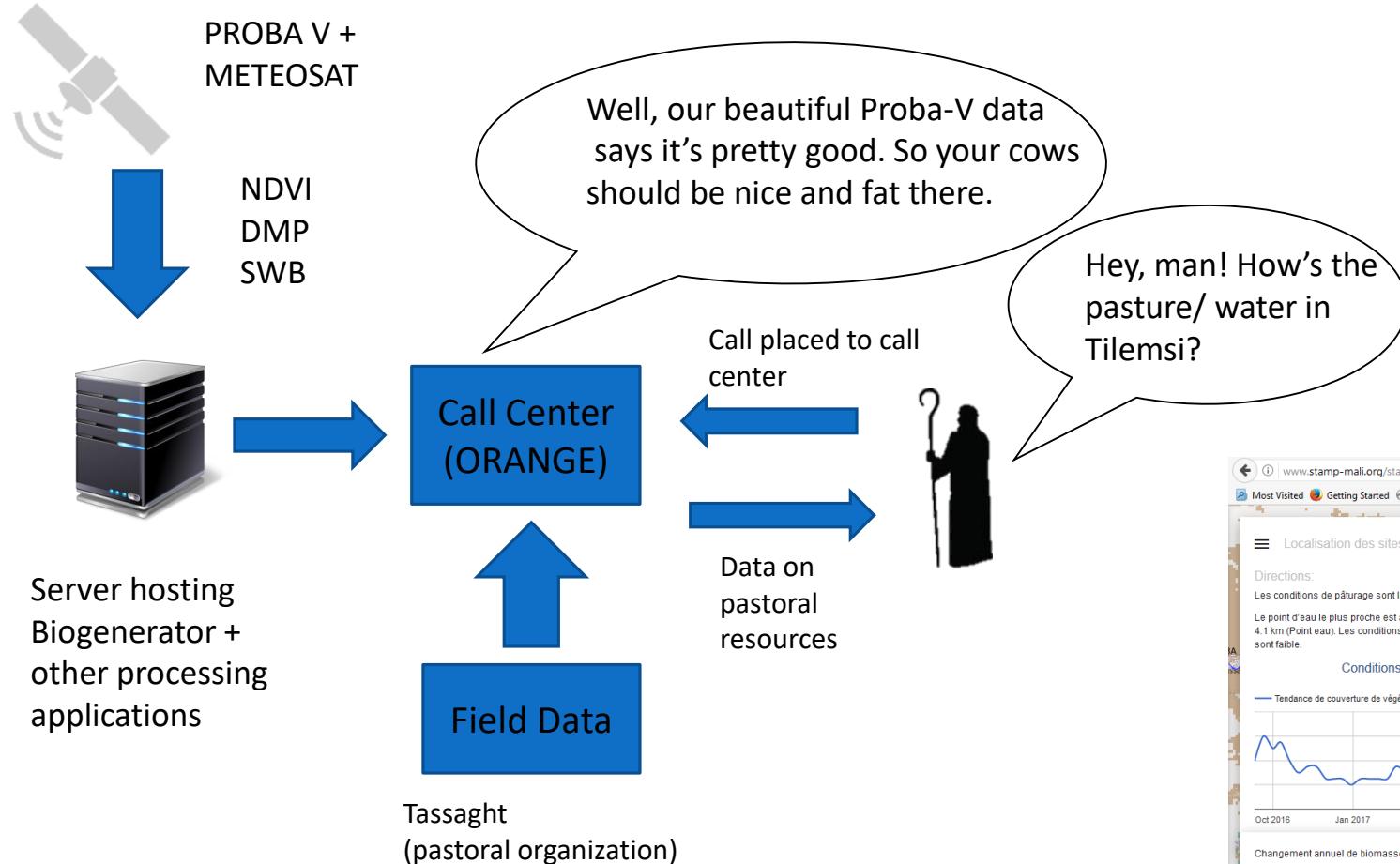
- FTP
- QGIS Plugin

WMS/  
WFS

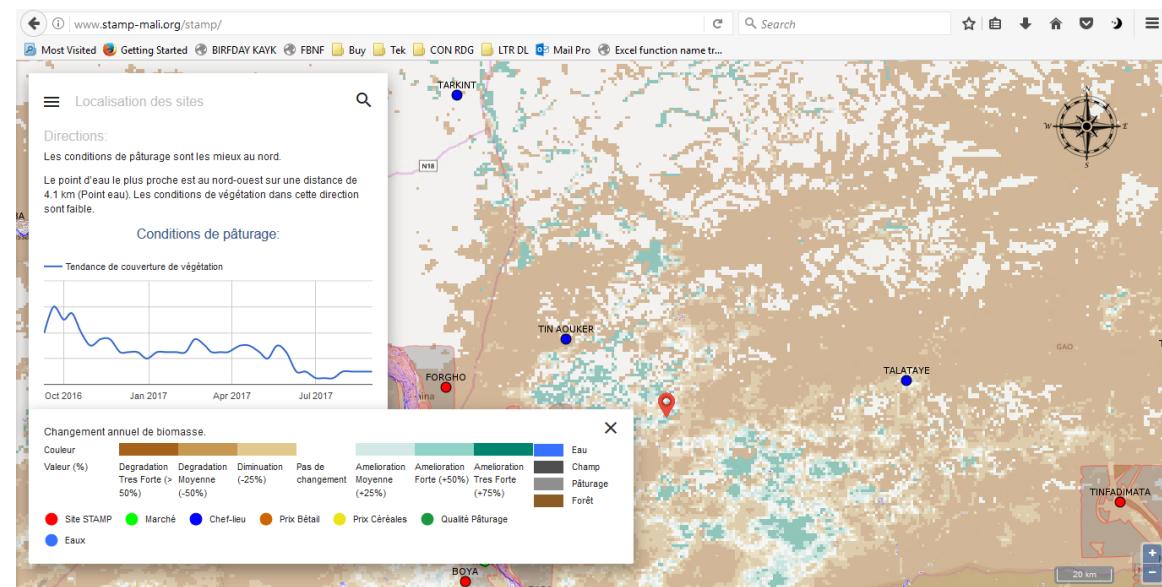


WebGISPublisher/  
your preferred  
web map

# Reaching the herders



- Project STAMP- Sustainable Technology Access for Malian Pastoralists
- Pilot project in Gao, Mali
- Pastoral call center providing data on surface water availability, pasture, market prices



# Lessons learned

Keep the data chain short and simple

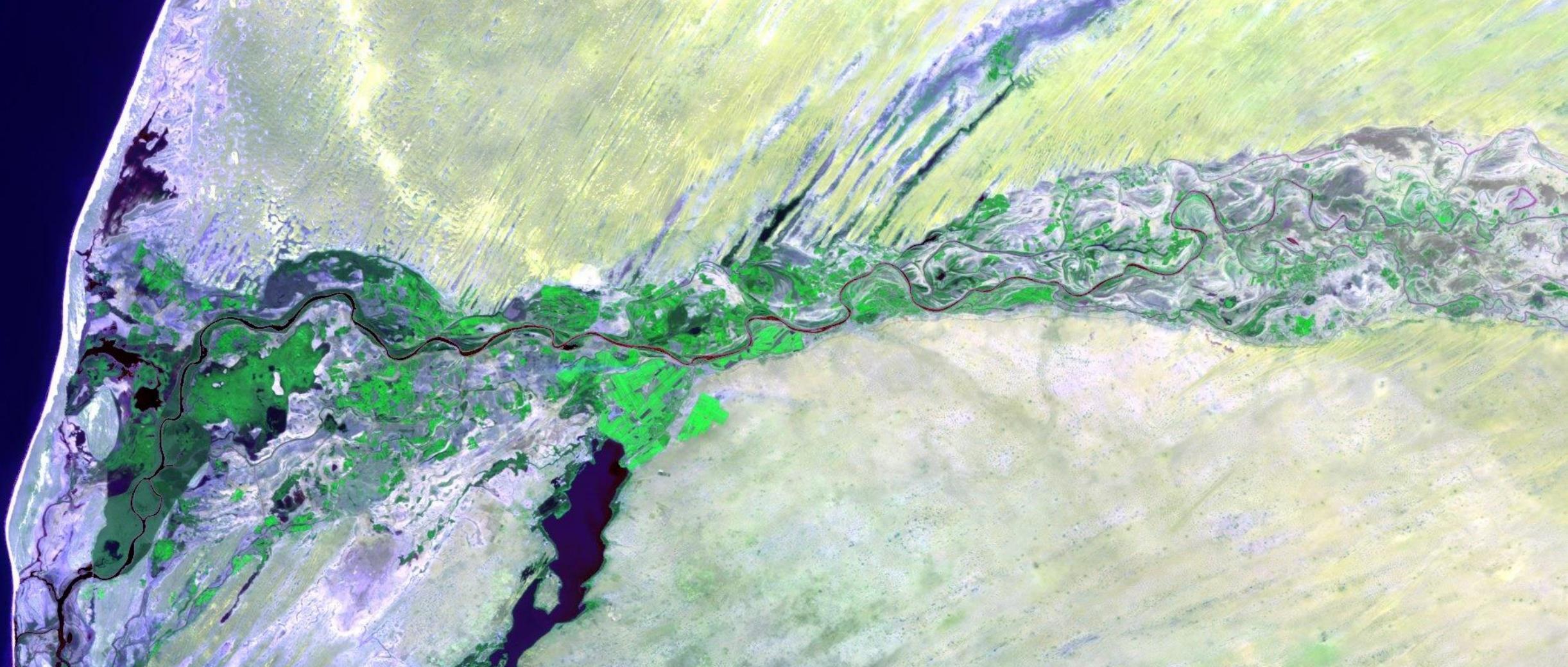
Never ignore the power of qualitative data in a GIS setting

Balance spatial and temporal resolution in imagery.

- 10m Sentinel imagery looks nice but doesn't always help if you only get one usable image every month

Automate whatever you can, but expect partners to prefer manual solutions

- EG: partners may prefer treating their data in excel and creating shapefiles manually



Thank you for your attention

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