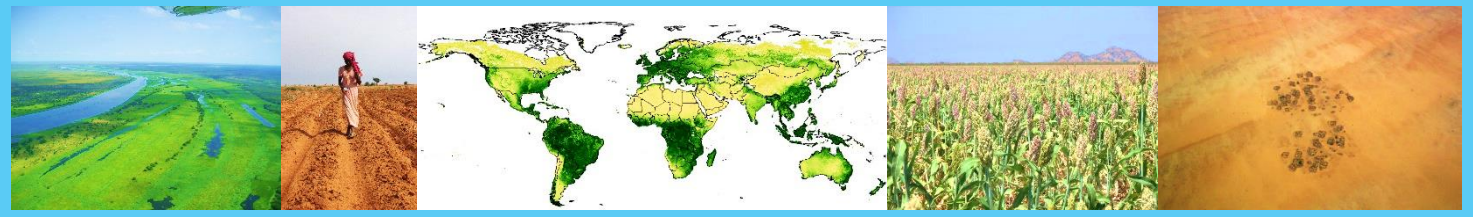

Satellite Imagery Analysis for Cropland Loss Assessment with Sentinel-2 October 2021

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vam food security analysis

Overview - SATELLITE IMAGERY ANALYSIS for Cropland Change Analysis

- **The security context in parts of northern Nigeria continues to hamper agricultural monitoring and national food security analyses.**

- **In collaboration with the European Commission's Joint Research Centre (JRC), WFP uses high-resolution satellite images to evaluate cropland changes in hard-to-reach areas of north-eastern and north-western Nigeria, comparing the situation for 2020 and 2021 agricultural season with a baseline prior the beginning of the security crisis (NE: 2013, NW: 2017).**

Methodology

- **Sentinel-2 is a land monitoring constellation of two identical satellites providing high resolution, high frequency, global coverage optical imagery.**
- **It covers the Earth's surface every 5 days, with 10m resolution.**

- **High-resolution satellite images (Sentinel-2, ESA/Copernicus) acquired between June 15 and October 15 are processed to detect cultivated land for each year of interest (current and baseline) – this theoretically covers the agricultural season, from land preparation to early stages of harvesting.**

- **The resolutions of this satellite imagery allows the detection of fields of any size and results at locality scale.**

- **Using a semi-automated method developed for this study, localities were covered, assigning to each village the associated degree of cropland change in its surroundings between 2020 and 2021 with a reference year prior to the security crisis.**

Methodology

- **The maps produced show in red, orange, yellow and green localities for which the following changes were detected:**
  - **Severe decrease** (>50% area loss)
  - **Medium decrease** (25% - <50% area loss)
  - **Slight decrease** (<25% area loss)
  - **Significant increase** (>50% area gain)
  - **Medium increase** (25% - <50% area gain),
  - **Slight increase** (<25% area gain),
  - **No Change**

- **Populated sites where no visible change was detected are represented in grey, including the ones with no agricultural land in both years. These categories are the result of a visual interpretation of satellite-derived composites, not validated with field data.**

Main Results

North East: Borno state

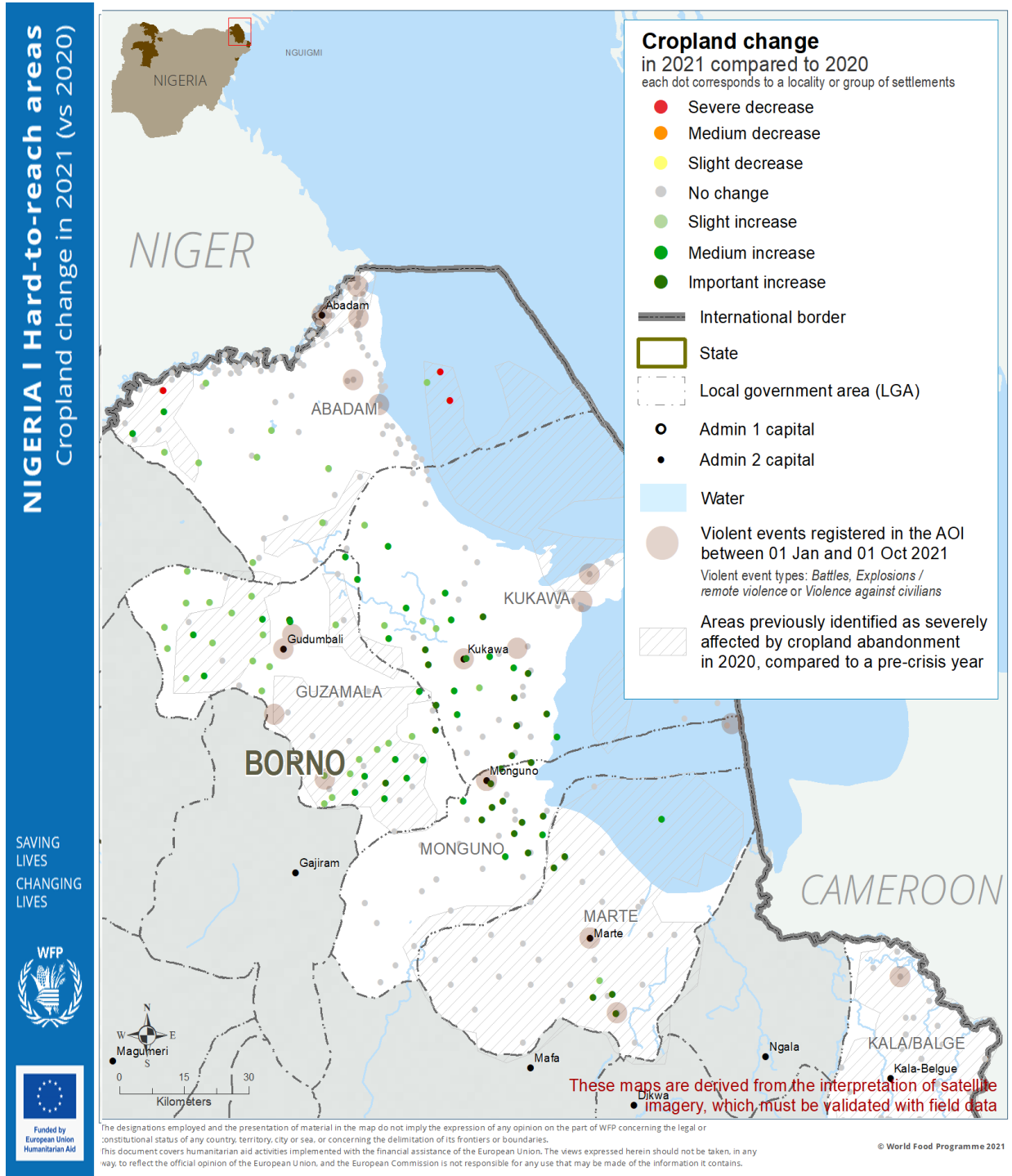
Five Local Government Areas (LGAs) located in the state of Borno were analysed: Abadam, Guzamala, Mungonu, Kukawa and Marte.

- **LGA-level analysis conducted by JRC highlights**

- an increase in cultivated areas (Abadam and Guzamala) compared to 2020. Compared to a reference year (2013), a slight increase in the northern parts of the LGA is noted, but strong decreases are observed in the centre and south.

- an increase in cultivated areas (Kukawa) compared to 2020, as well as compared to a reference year (2013) in the southern parts.

- a strong increase in cultivated areas (Mungonu and Marte) compared to 2020, but a strong decrease compared to a reference year (2013)



Thank you for Listening