Predict Food Security in Sahel

Photo: Alfredo Cáliz
Location: Mali

PRECAUTIONS

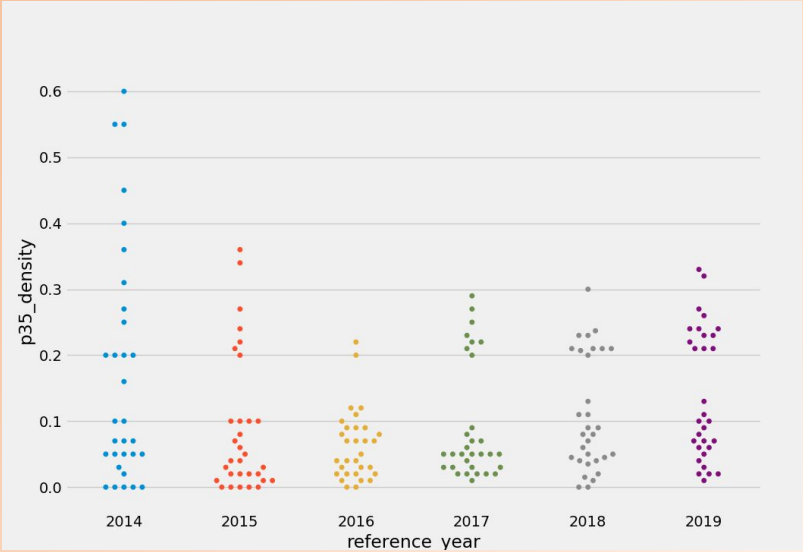
- Just a prototype
- Thesis

WHAT

Machine Learning algorithm that aims to predict Food Security in Sahel

Predicting the **number of people** suffering from **Food Insecurity** at administrative level 2

Lean Season (June – August)



WHY

The office will benefit from knowing in advance the areas in the Sahel that suffer most from food lack

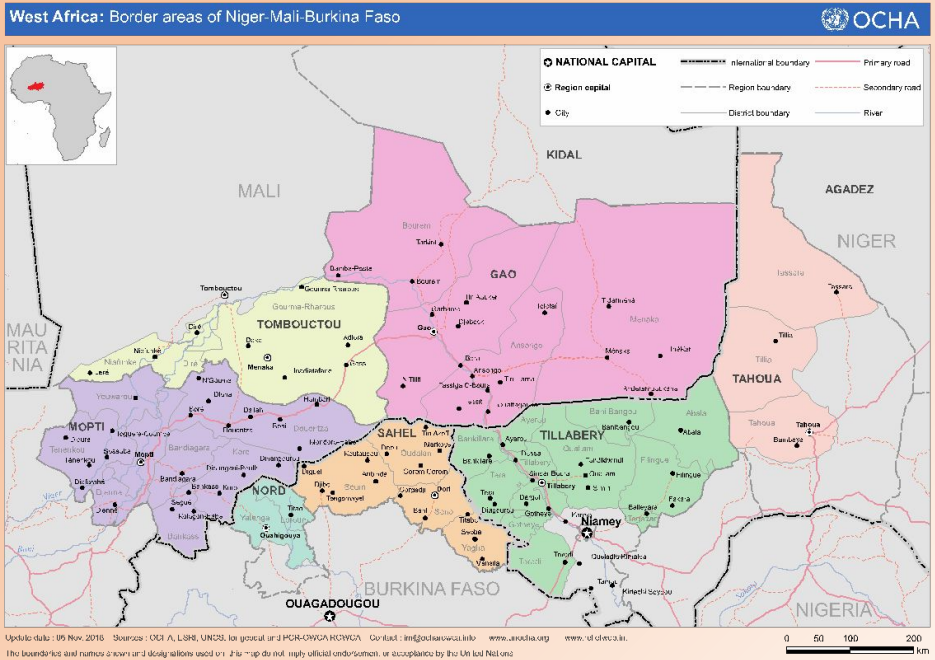
- Easy and accurate selection of areas
- Prehemptive aids
- Fund savings

WHERE

A model for the entire Sahel

The prototype focuses on the **Liptako-Gourma** area

Borders between Mali, Burkina Faso and Niger



INPUT DATA

Features linked to Food Security, easy to measure an openly avaible:

- **Conflicts**: terrorism, battles, explosions, riots and protests
- **Food Prices**: mean millet price
- **Biomass**: presence of vegetation

Source: https://data.humdata.org/

OUTPUT DATA

Cadre Harmonise:

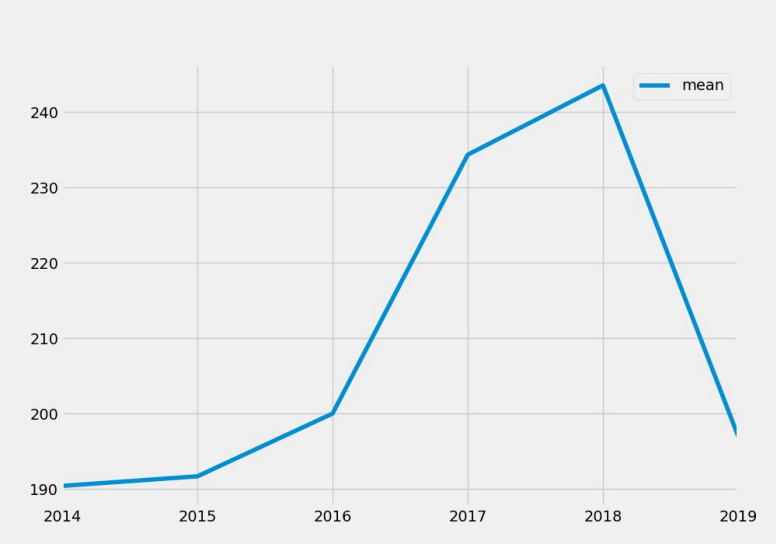
We want to predict the percentage of people in Food Insecurity in a certain area in a given year

Food Insecurity

IPC Phase Number	Phase	Description
1	Generally Food Secure	More than 80% of households can meet basic food needs without atypical coping strategies
2	Borderline Food Insecure	For at least 20 percent of households, food consumption is reduced but minimally adequate without having to engage in irreversible coping strategies. These households cannot fully meet livelihoods protection needs.
3	Acute Food and Livelihood Crisis	At least 20 percent of households have significant food consumption gaps OR are marginally able to meet minimum food needs only with irreversible coping strategies such as liquidating livelihood assets. Levels of acute malnutrition are high and above normal.
4	Humanitarian Emergency	At least 20 percent of households face extreme food consumption gaps, resulting in very high levels of acute malnutrition and excess mortality; OR HH[clarification needed] households face an extreme loss of livelihood assets that will likely lead to food consumption gaps.
5	Famine/Humanitarian Catastrophe	At least 20 percent of households face a complete lack of food and/or other basic needs and starvation, death, and destitution are evident; and acute malnutrition prevalence exceeds 30% ; and mortality rates exceed 2/10000/day

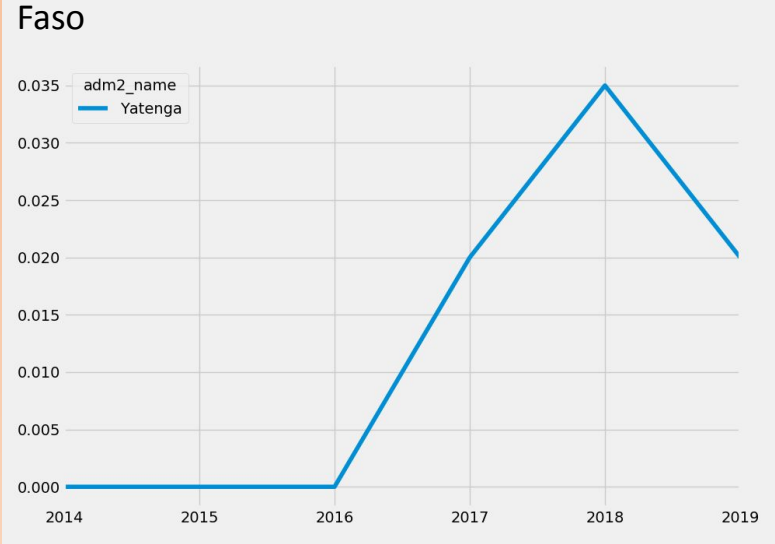
Source: https://data.humdata.org/

CORRELATIONS: YATENGA



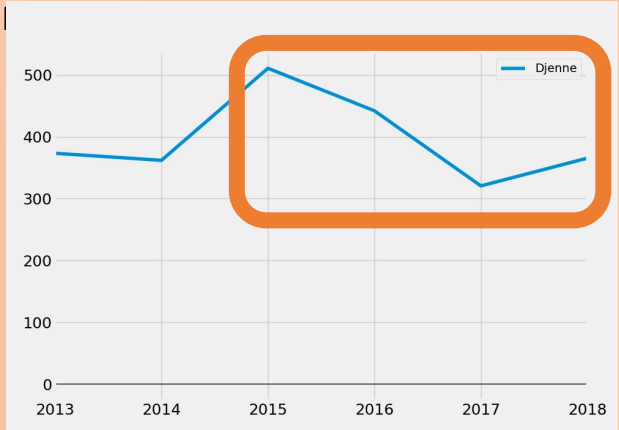
Mean Millet Price in Yatenga, Burkina Faso

Cadre Harmonise in Yatenga, Burkina Faso

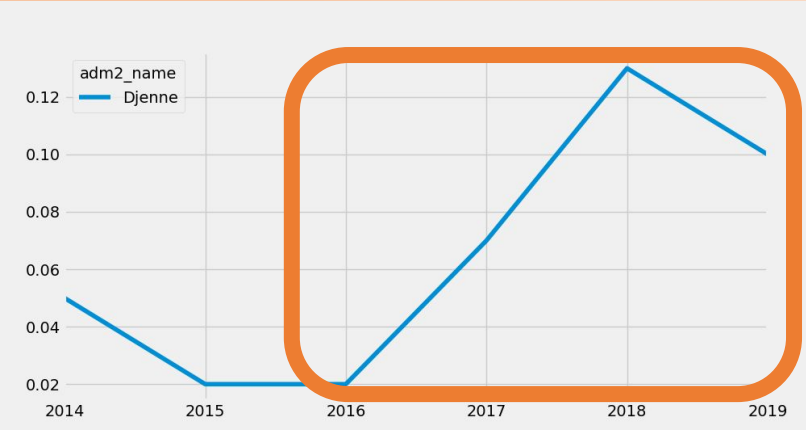


CORRELATIONS: DJENNE

Biomass Index in Djenne,



Cadre Harmonise in Djenne,

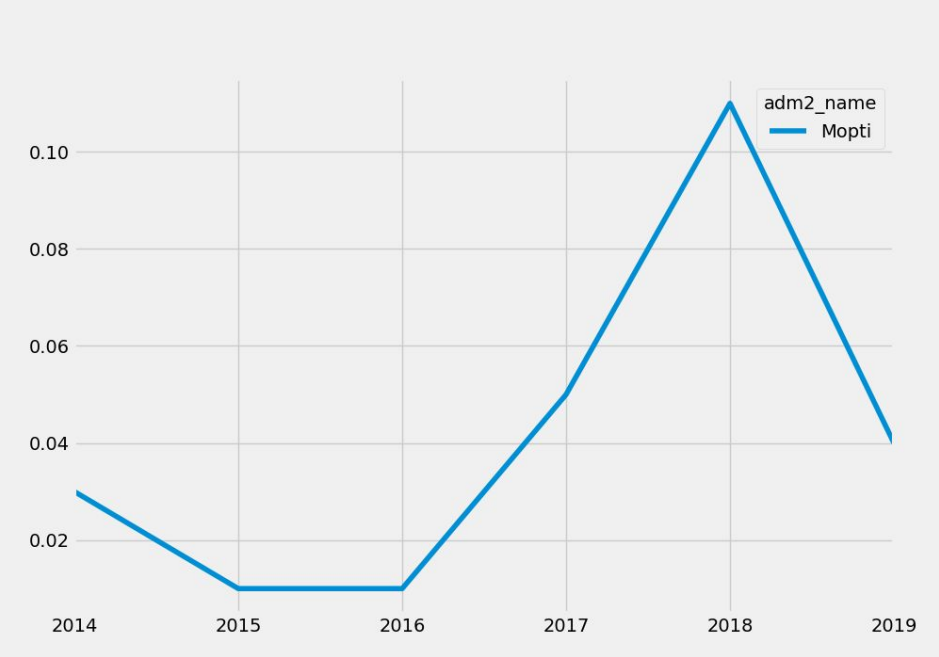


Inverse correlation:

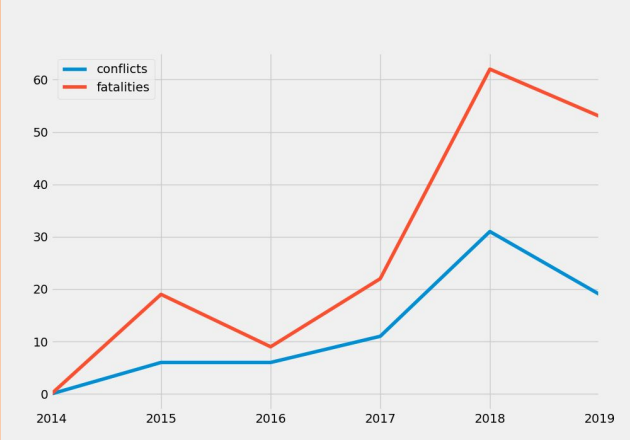
When the Biomass Index decreases the we see an increase in Food Insecurity in the following year

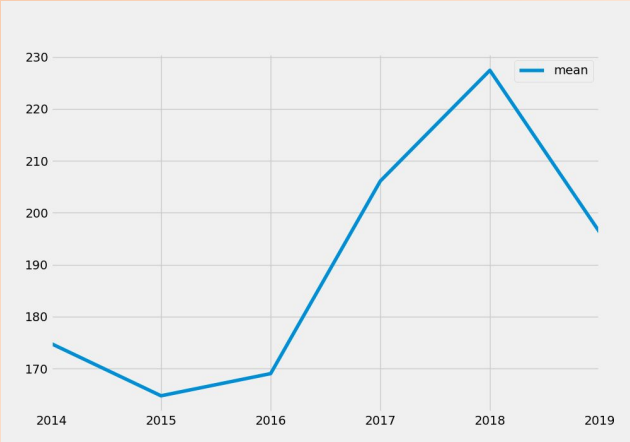
CORRELATIONS: MOPTI

Cadre Harmonise in Mopti,



Conflicts and Fatatalities in Mopti,





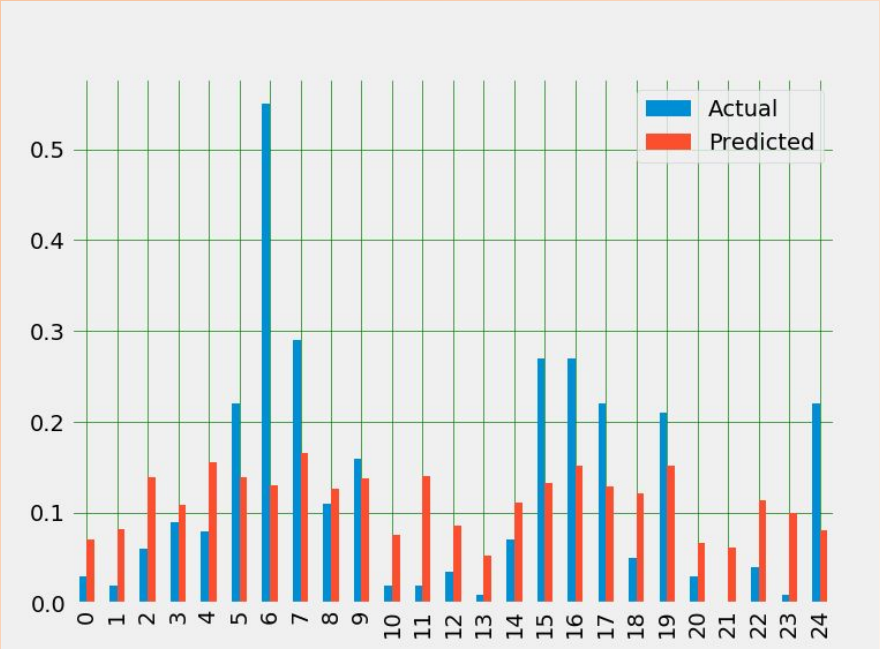
Mean Millet Price in Mopti, Mali

LINEAR REGRESSION MODEL

Trained a Linear Regression Model

Root Mean Squared Error is 90% of the Mean Value to be predicted

We will look for factors that allow us a better accuracy



NEXT STEPS

- Find **more data**: increasing the number of administrative level 2 areas
- Look for input **features that fit** the value we want to predict: use Rainfall data as an input
- **Better assumption**: we assumed that this data has a linear relationship, but that might not be the case

Merci

Photo: Alfredo Cáliz