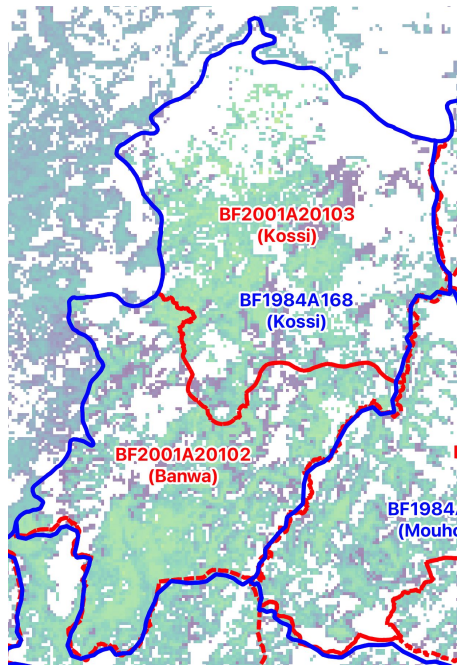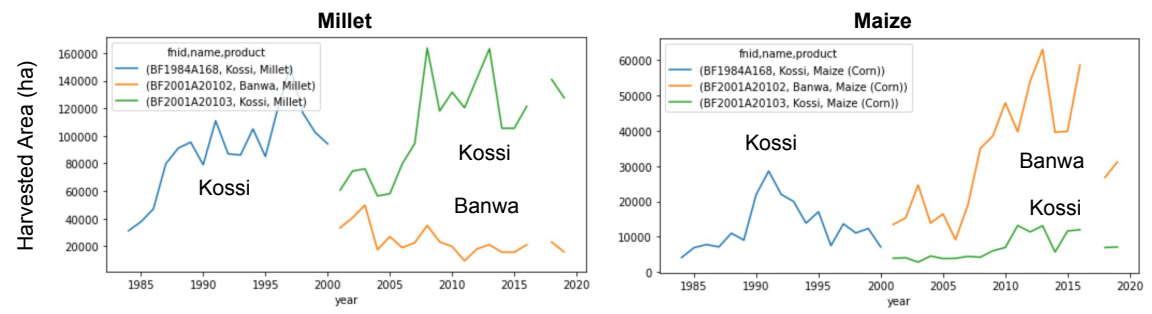Case A (matched boundaries)

*In Burkina Faso, admin level-1 became admin level-2 in 2001, so BF1984A1 is the same level as BF2001A2.

(Background: IFPRI crop mask)
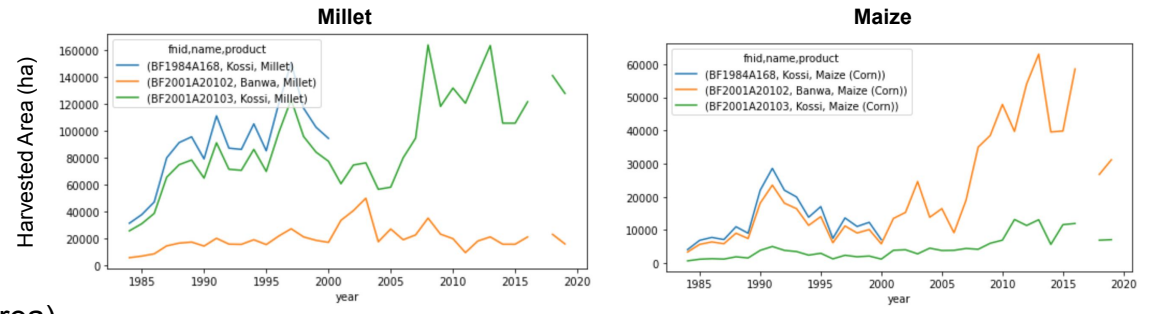


- BF1984A168 (Kossi) is divided to BF2001A20103 (Kossi) and BF2001A20102 (Banwa).
- Banwa has larger cropped area (~5,200 Km2; ~87%) than Kossi (~4,300 Km2; 57%).
- However, the dominant region of crop production varies by crop type
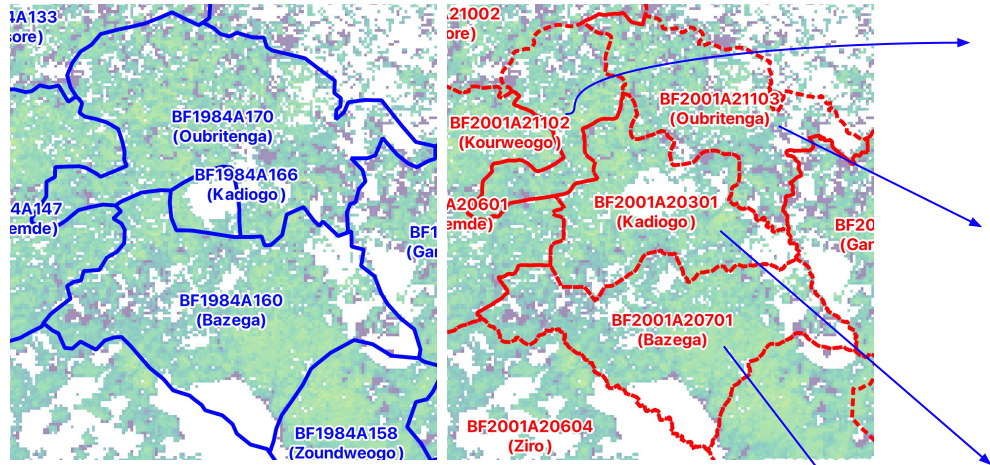


*Production data shows the same patterns

- In this case, we estimate historical data using ratios of mean harvested areas in current boundaries per crop type
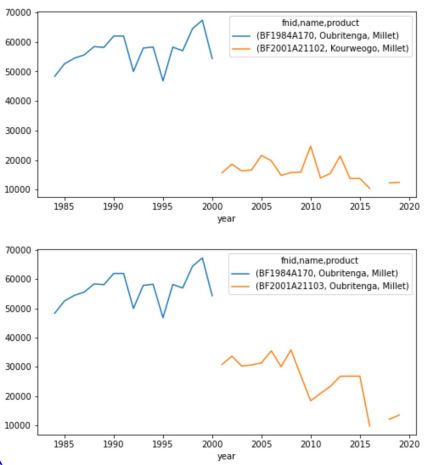


$$TS_{new} = TS_{old} \times \frac{\bar{A}_{new}}{\sum_{i=1}^{n} \bar{A}_{new,i}}$$

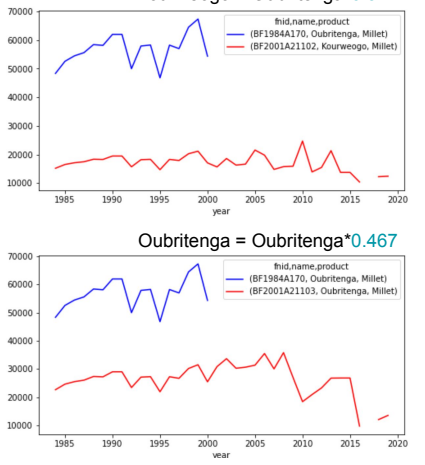*TS (time-series), $\bar{A}$ (mean harvested area)

# Case B (mismatched boundaries)



The case A approach will lose spatial variabilities, so we use the following steps:

1) Identify partial areas between old and new districts
2) Calculate the ratios of partial cropland areas to total cropland areas in the old districts.
3) Aggregate the scaled time-series of old district(s).

$$TS_{new} = \sum_{i=1}^{n} \left( TS_{old,\,i} \times \frac{C_{new\,\cap\,old,\,i}}{C_{old,\,i}} \right)$$

*TS (time-series), C (cropland area)

**Original Harvested Area**

**Extended Harvested Area**

Kourweogo = Oubritenga*0.314

Oubritenga = Oubritenga*0.467

Kadiogo = Bazega*0.263 + Kadiogo*1.000 + Oubritenga*0.218

Bazega = Bazega*0.737