

Using Sentinel-2 images and hydrometric data for assessing surface water uptakes for agricultural purposes in Upper-Comoé sub-basin, Burkina Faso.

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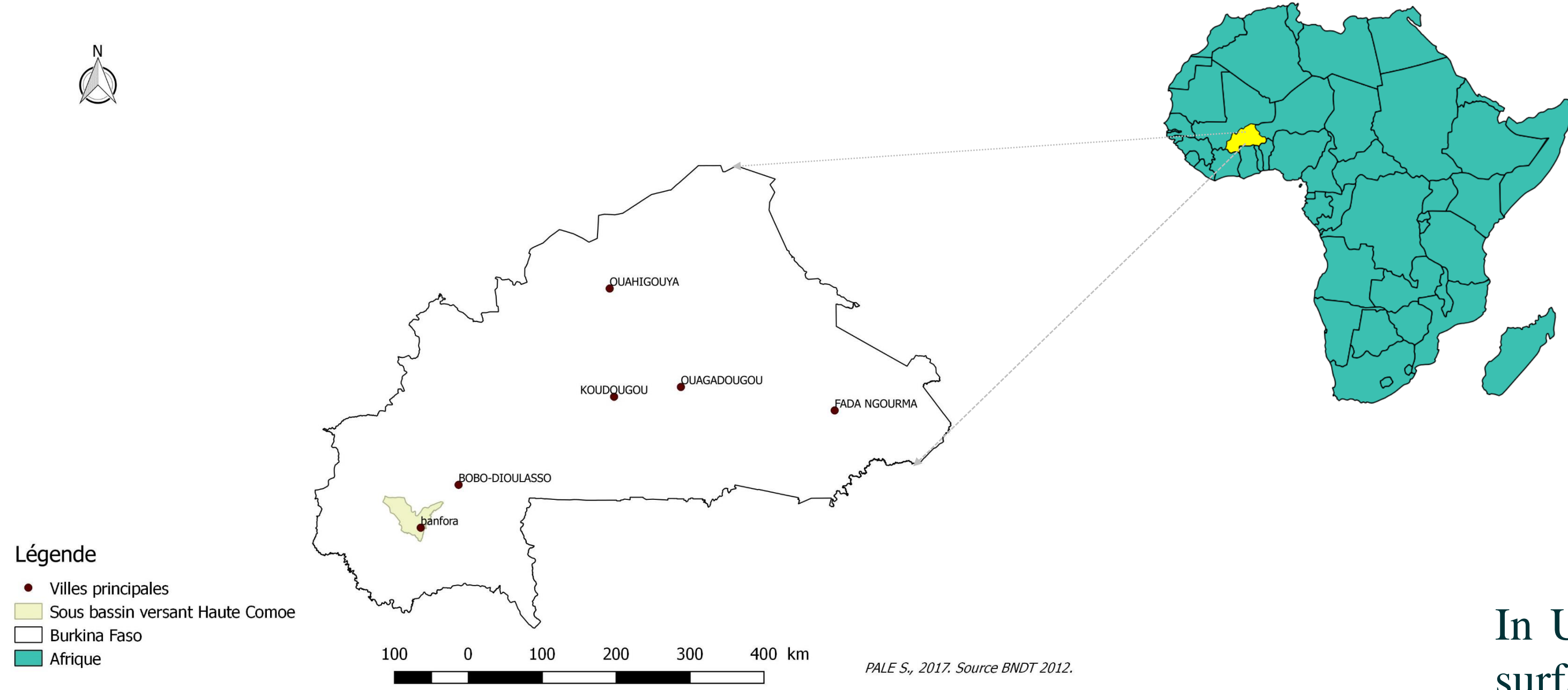
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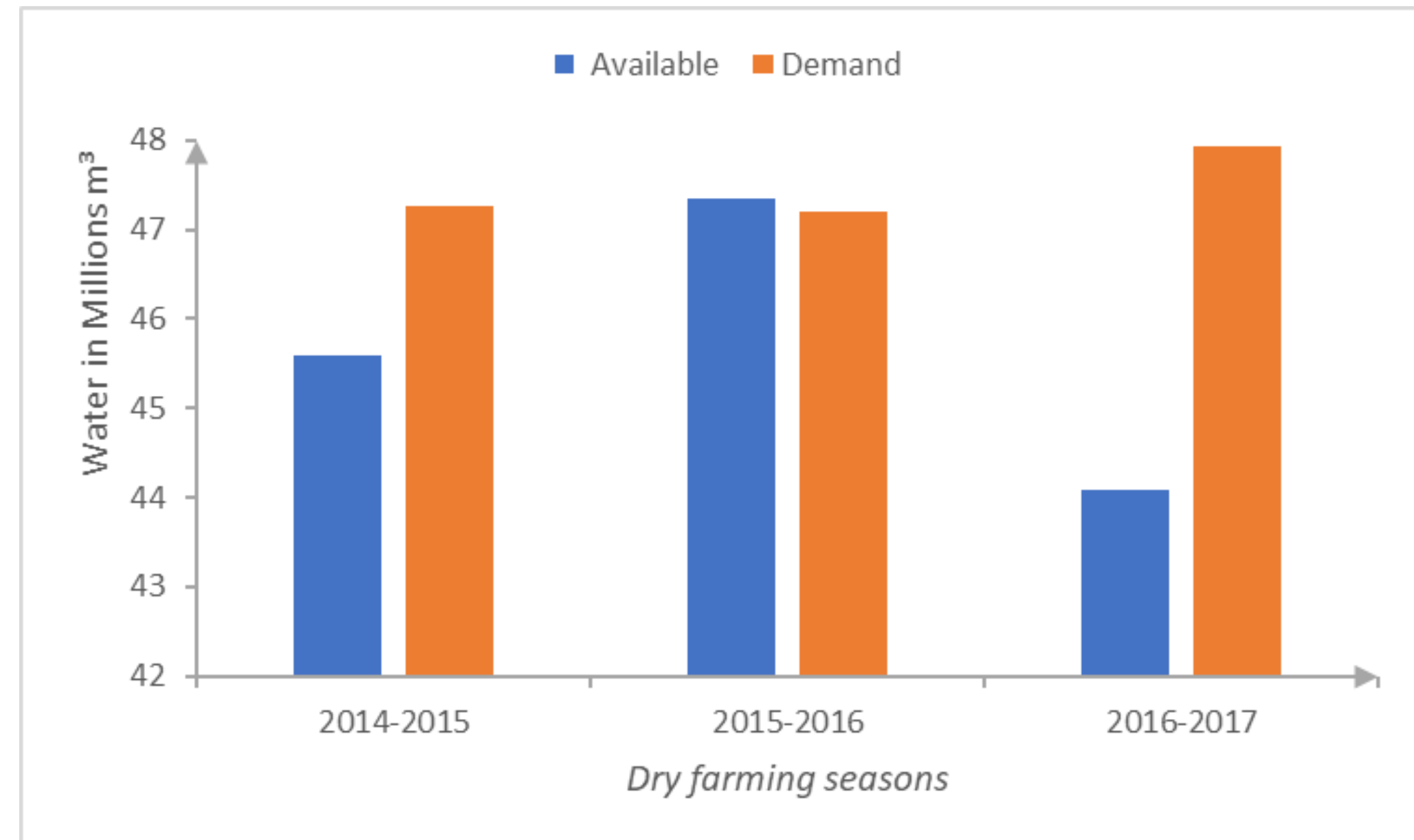
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STUDY AREA



Location of Upper-Comoé basin, South West of Burkina Faso, in Africa.

PROBLEMATIC

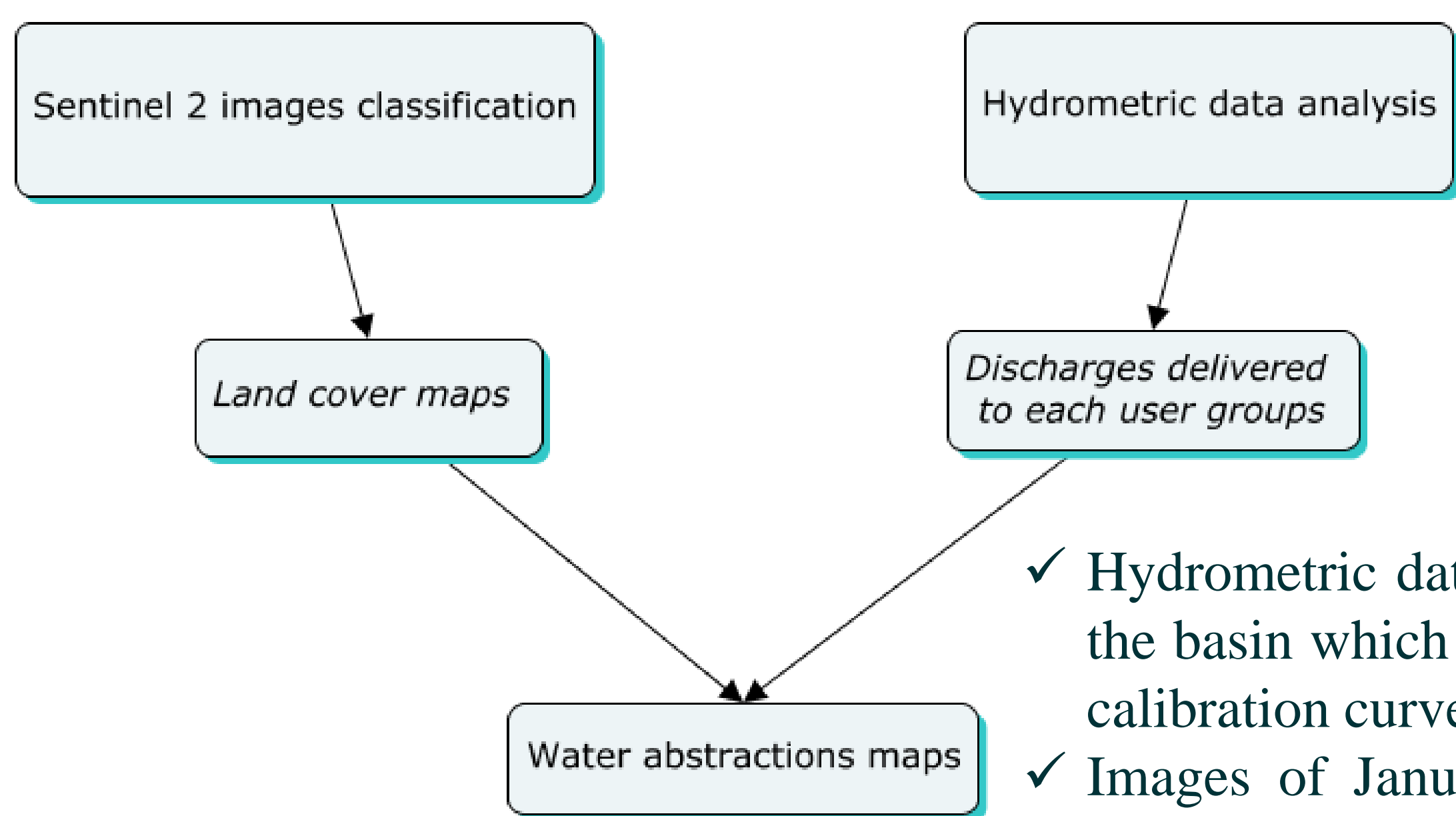


In Upper-Comoé sub-basin, water demand for agricultural purposes is higher than available surface water resources. Farmers groups accuse each others to misuse water during the dry farming season. This situation leads frequently to conflicts between the different groups. But until now, nobody knows who are the guilty farmers (amount of water uptaked by each group compared to amount of water that should be withdrawn from the main river).

Objective: provide information about water and land uses for a rational management of these resources.

- ✓ Assess the amount of water uptaked by each group of farmers thanks to the estimation of discharges delivered to them;
- ✓ Determine the amount of water that should be uptaked by each water users at a given period through the estimation of their cultivated areas.

METHODOLOGY



- ✓ Hydrometric data are provided by a network of stations (limnimeter + mini-divers) installed across the basin which measure water levels each 10 s. Water levels are then converted in discharges using calibration curves.
- ✓ Images of January 29 th 2016, has been classified using support vector machine algorithm, to determine land cover map of the basin: download, resample, subset, classification and evaluation.



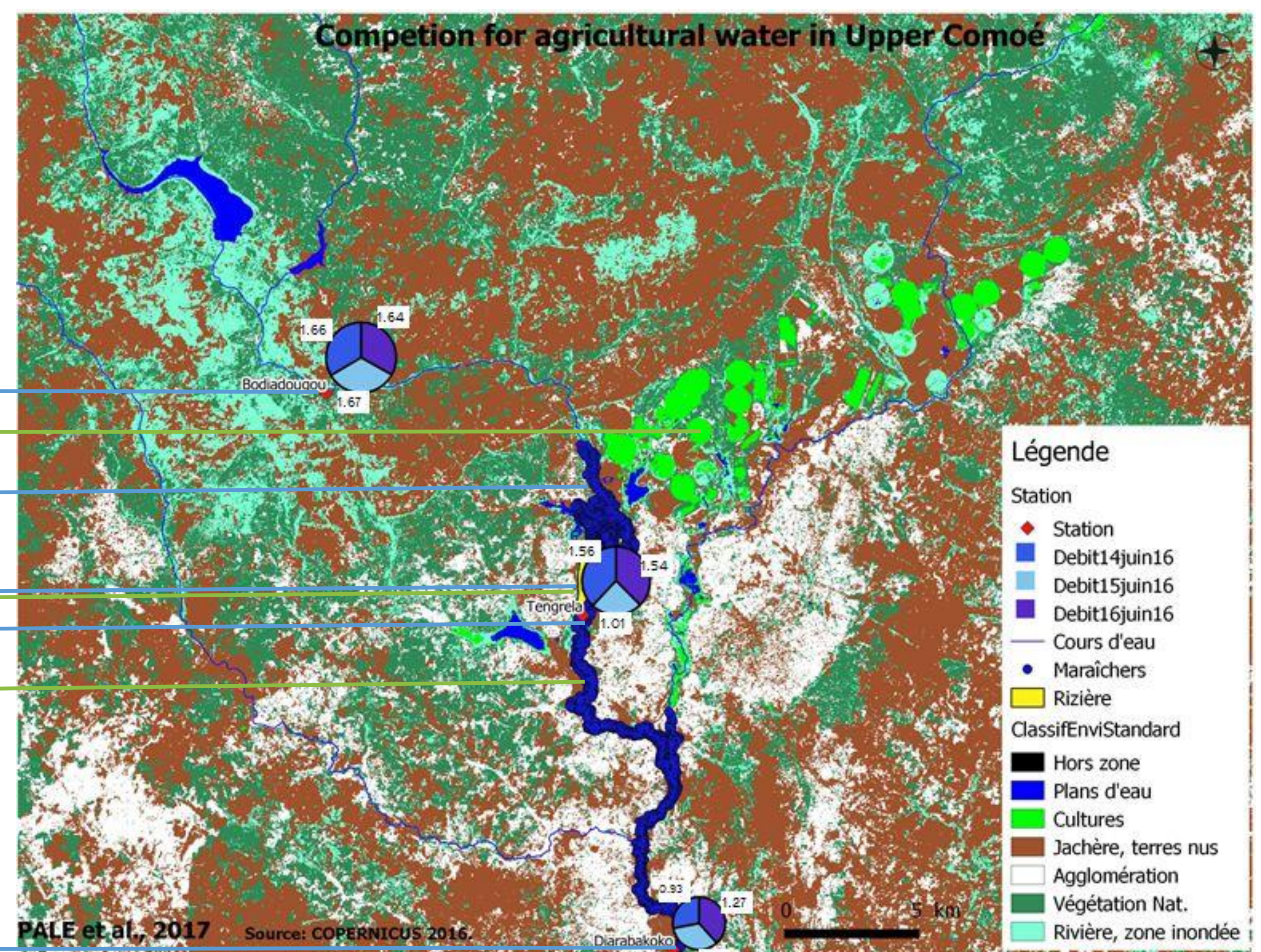
Hydrometric stations

RESULTS

Cultivated areas estimated in January 2016 by Sentinel 2 images.

Water users	Area cultivated ha	Kappa coefficient
Sugar industry	2443	0.70
Irrigated rice	242	0.67
Vegetable plots	145	0.94 to 0.98
Total	2830	-

Discharges	Uptakes	Needs (m³s ⁻¹)
1.59 to 1.67	0.54 to 0.57	2.44
1.05 to 1.10	0.00 to 0.67	0.24
0.08 to 1.03	0.72 to 1.05	0.15
0.00 to 0.38		



Source: adapted from Palé & al., 2016.

CONCLUSION

- ✓ Vegetable & rice farmers uptaked more water than they needed on Comoé river; but no conclusion can be drawn at this step about sugar industry water withdrawal because it also uptaked water on Yanon river;
- ✓ Advice should be addressed to water users to improve their practices, if the results are confirmed.

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