



**HAL**  
open science

## **Factors influencing land-use changes : analysis at territorial scale.**

Elise Ygaunin, Maude Quinio, François Coléno, Aude Barbottin

► **To cite this version:**

Elise Ygaunin, Maude Quinio, François Coléno, Aude Barbottin. Factors influencing land-use changes : analysis at territorial scale.. XVIII ESA Congress, Aug 2024, Rennes, France. hal-04701693

**HAL Id: hal-04701693**

**<https://hal.inrae.fr/hal-04701693v1>**

Submitted on 18 Sep 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



# Factors influencing land-use changes : Analysis at territorial scale.

Elise Ygaunin<sup>1</sup>, Maude Quinio<sup>2</sup>, François Coléno<sup>1</sup>, Aude Barbottin<sup>1</sup>

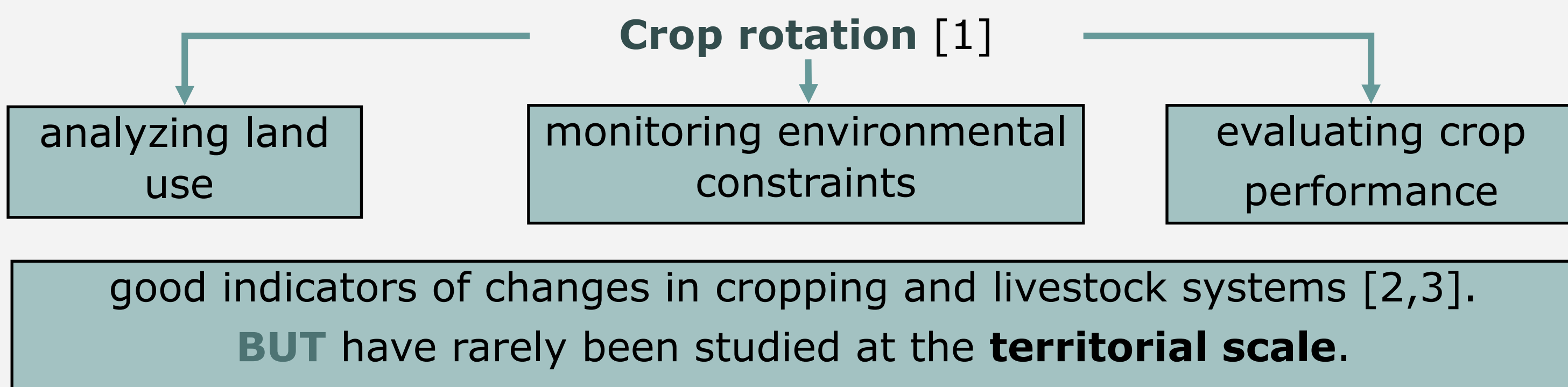
<sup>1</sup>UMR SADAPT, INRAE, AgroParisTech, Université Paris-Saclay, 91120 Palaiseau Cedex, France

<sup>2</sup>UMR SADAPT, AgroParisTech, INRAE, Université Paris-Saclay, 91120 Palaiseau Cedex, France

## Context

French public policies and private schemes implemented for:

- **Development of farming systems** that are less dependent on chemical inputs
- **Environment and biodiversity** preservation



## Objective

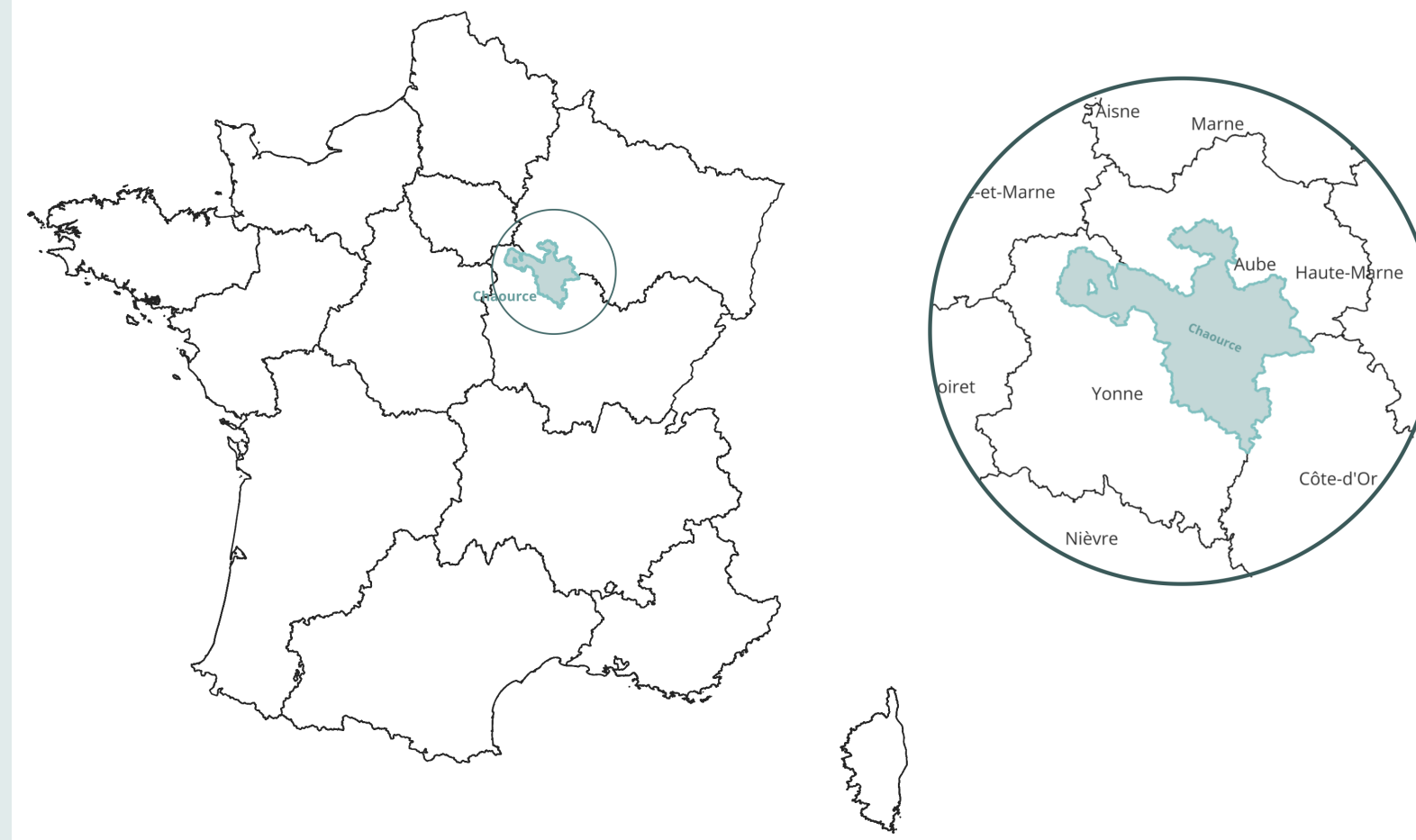
Analyse the shifts in land use and the factors driving these changes.

Emphasize two key aspects:

- Preserving meadows
- Diversifying crop sequences

## Materials and methods

Map depicting geographical region  
the Chaource PDO



2007

2021

**Land Parcel Identification System (LPIS) data**

Identify changes in cropping and livestock systems by observing shifts in land use

**15 semi-directive interviews coded for analysis** with local stakeholders (PDOs and IGs, agricultural advisors, agroindustry, Regional Natural Parc, cooperative, water syndicate and policymakers)

## Key facts

**2 departments** : Yonne (89), Aube (10)  
**Surface**: 327 869ha

**In the two departments** :

8524 farms  
10% of farmland in organic agriculture  
**Between 2010 and 2020** :

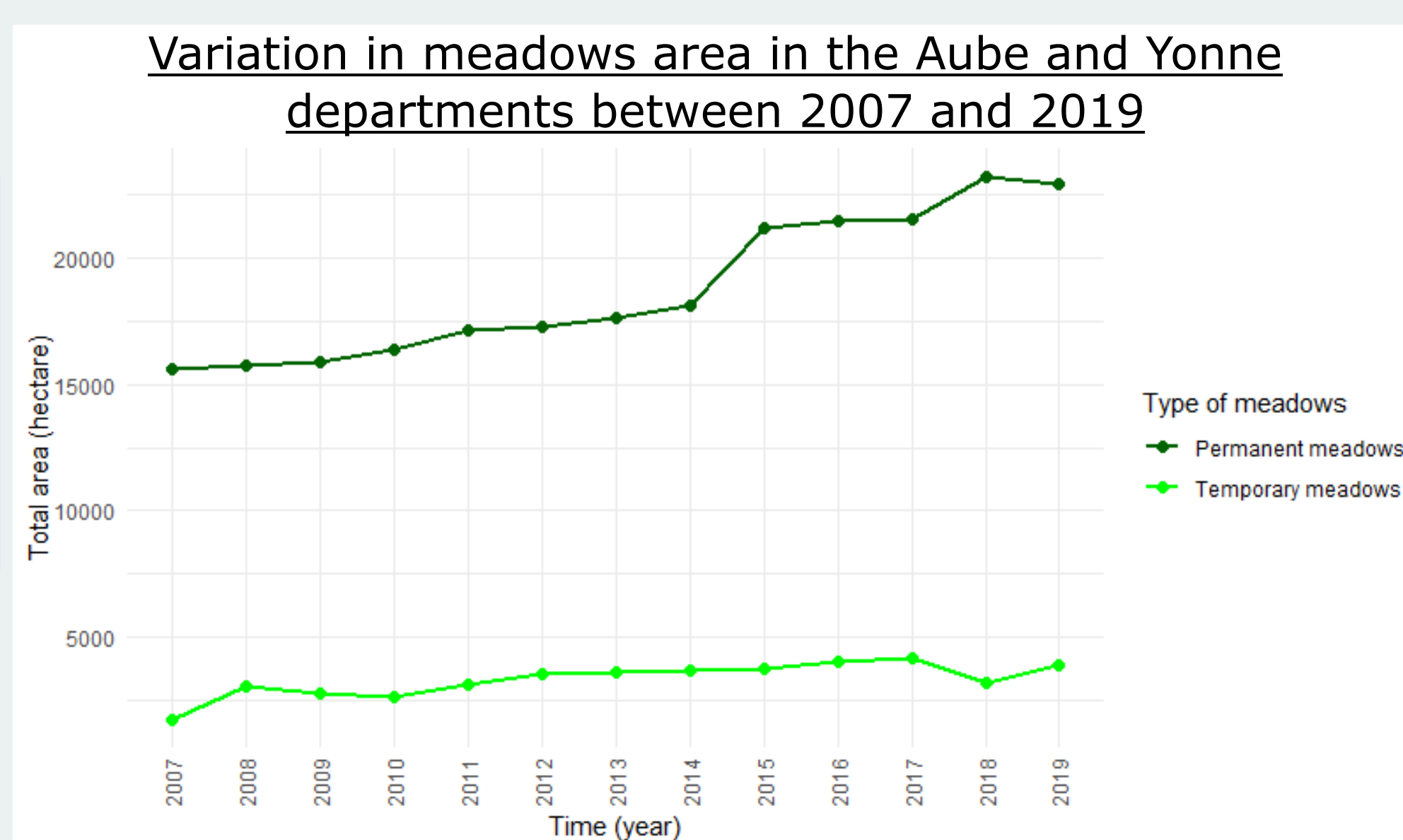
-10% in the number of farms  
+13% average UAA per farm

National decline in the number of farms specializing in livestock farming [3]

## Results

### Meadows maintenance supported by several economic measures

"It's closely related to the type of soil. Regions that were able to abandon livestock in favor of crop have nearly all made the switch."



### Response element

- Terms of reference PDOs/IGs: Higher milk price than conventional Minimum livestock units per hectare
- Soils unsuitable for other crops
- Regional quotas for meadows conversion
- CAP subsidies (Agri-Environmental and Climate Measure)
- Partnerships and economic players (Subsidy for Environmental Services\*)

"Since they have opened a SES\* and then blocked it on their territory, we can't open any MAEC there."

### Key stakeholders involved

- PDO syndicates
- Water syndicate
- Organic farming groups
- Local economic players
- Food industry
- Regional and departmental authorities Chamber of agriculture

### Factors limiting the preservation of meadows

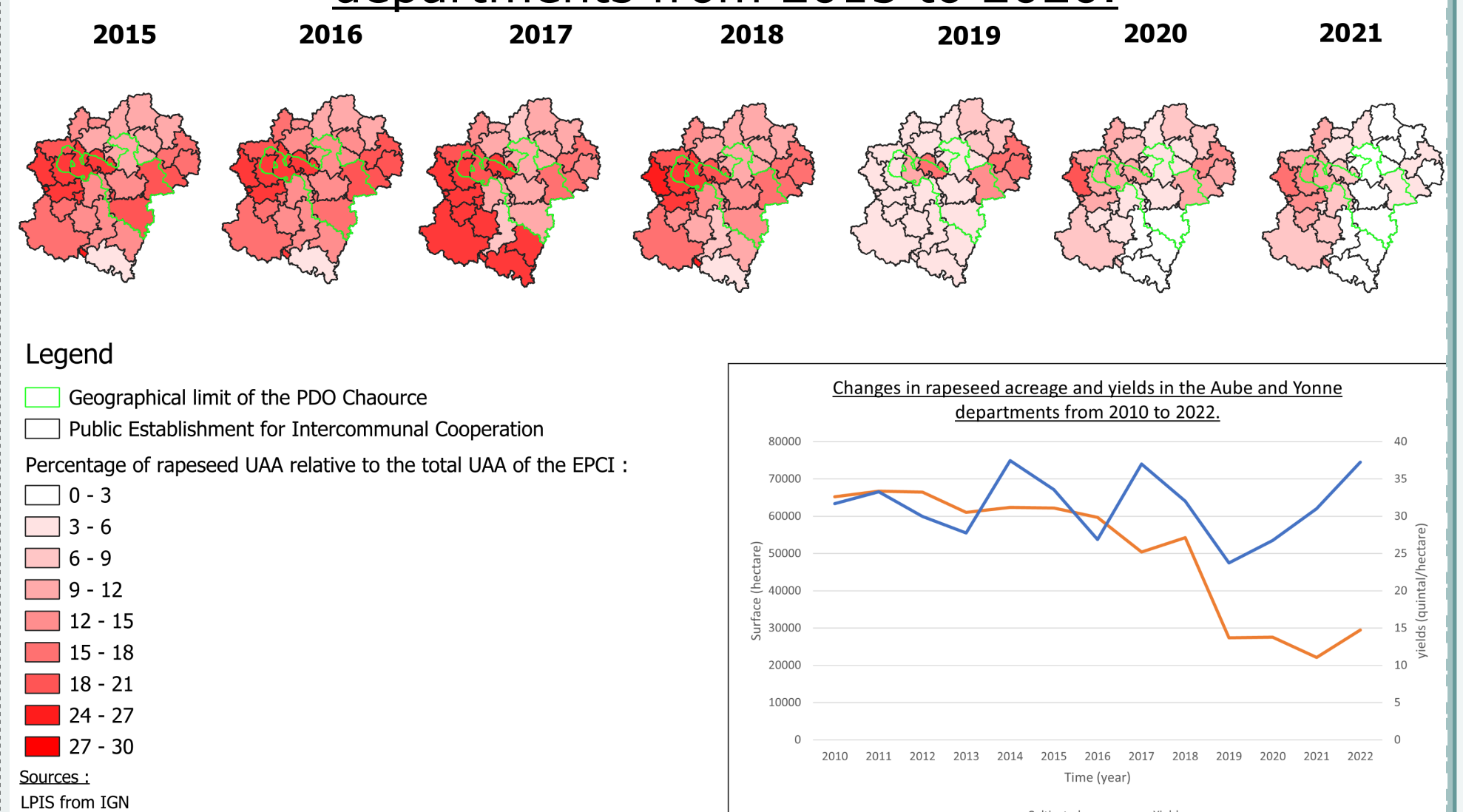
- More profitable production
- Climate Change
- Lack of territorial coordination, a limited number of collaborative projects
- Financing and other difficulties (manual labor, farm transmission)
- Difficulties in identifying a use for meadows in the absence of livestock

### The influence of local stakeholders and climate change on production

#### Crop rotation context in the area

Decline in rapeseed yields  
Increase in resistant pests  
Worsen drought conditions  
↓  
Rapeseed-wheat-barley rotation ineffective  
↓  
Disappointing profitability from new crops after diversification attempts

Change in the proportion of UAA cultivated with rapeseed within the total UAA by EPCI in the Aube and Yonne departments from 2015 to 2020.



### Factors hindering diversification in crop rotation

- Increased occurrence of climatic hazards combined with a lack of knowledge on alternative crops
- Public policies (eg. Water restriction, pesticides regulation)
- Fluctuating prices and market opportunities

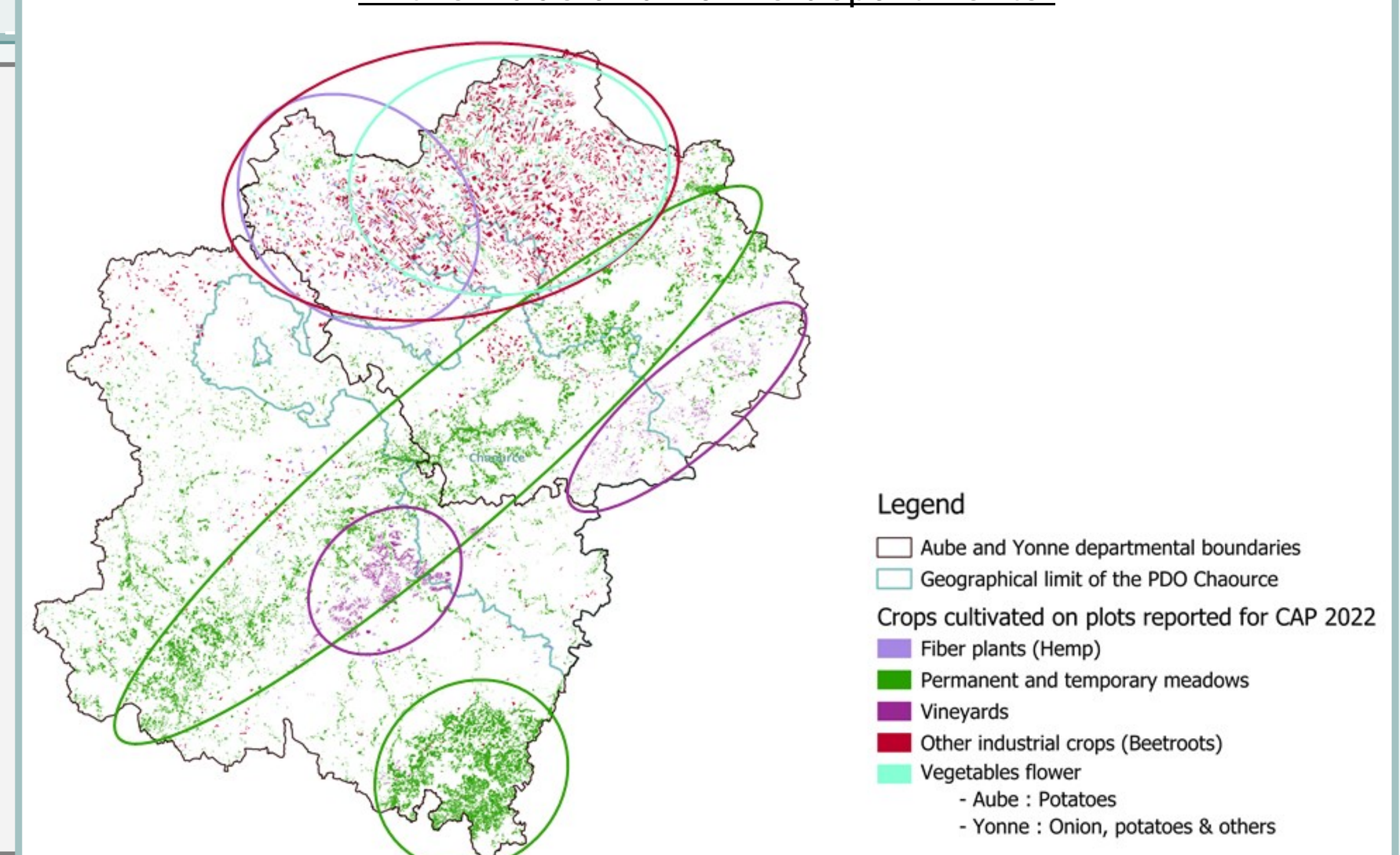
"Some wanted to stop producing carrots and celery because it was much more lucrative to produce wheat, which was at 400 euros per ton."

### Sectoralization of production due to

- Influence of agri-food industries, cooperatives, and origin appellations: Contractualization and development of market opportunities for specific productions in the collection area.
- Significant soil heterogeneity
- Insufficient communication between sectors

"Insufficient communication among the various players is hindering progress. There's still a need for more collaboration and networking."

Map of various crop rotations reported to CAP in 2022 in the Aube and Yonne departments.



## Conclusion and perspectives

Major elements influence agricultural production at the territorial scale

Restricted communication, influenced by an industry-focused perspective and emerging opportunities

Risks of oversimplification and economic difficulties exacerbated by climate change and technical barriers

Hyperspecialization of territories, with a growing emphasis on industrial crops

Evolution of land-use involves numerous stakeholders:

- **Collective regional action** is crucial for global resilience
- **Cooperation and shared responsibility** are essential to achieving sustainable and effective territorial development

**Need for:** synergy between different agrosystems, which may involve land use [4].

[1] Barbieri P., Pellerin S., Nesme T., 2017. Comparing crop rotations between organic and conventional farming. DOI:10.1038/s41598-017-14271-6

[2] Mignolet C., Schott C., Benoît M., 2004. Spatial dynamics of agricultural practices on a basin territory: a retrospective study to implement models simulating nitrate flow. The case of the Seine basin. Agronomie, EDP Sciences, 2004, 24 (4), pp.219-236. <10.1051/agro:2004015>. <hal-00886024>

[3] Chambres d'agriculture, 2023. Regards d'avenir sur l'élevage en France. Available at: [https://chambres-agriculture.fr/fileadmin/user\\_upload/National/FAL\\_commun/publications/National/rapport-elevage1-web.pdf](https://chambres-agriculture.fr/fileadmin/user_upload/National/FAL_commun/publications/National/rapport-elevage1-web.pdf)

[4] Accatino F., Tonda A., Dross C., Leger F., Tichit M., 2019. Trade-offs and synergies between livestock production and other ecosystem services. Agricultural Systems, 2019, 168, pp.58-72. 10.1016/j.agsy.2018.08.002. hal-02012646

This work was supported by the national research program « Growing and Protecting crops differently » (ANR-20-PCPA-0001).