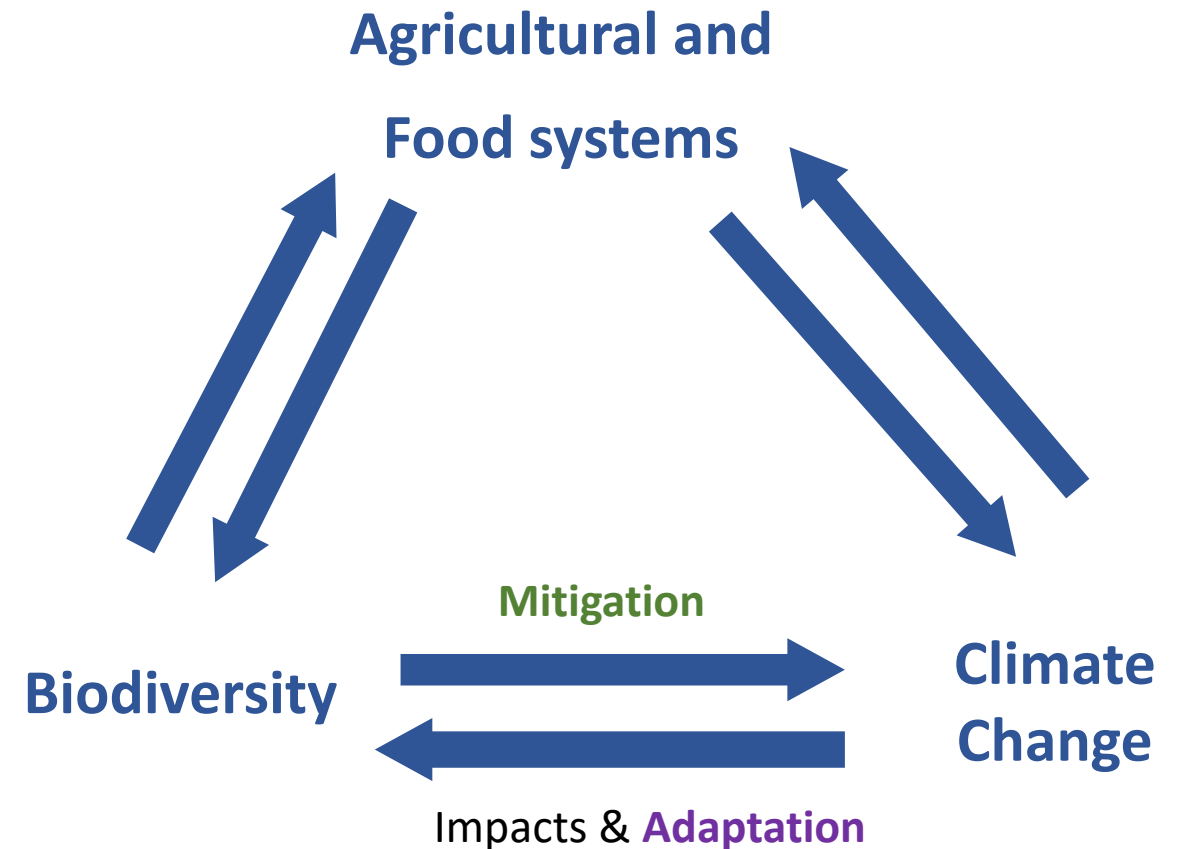


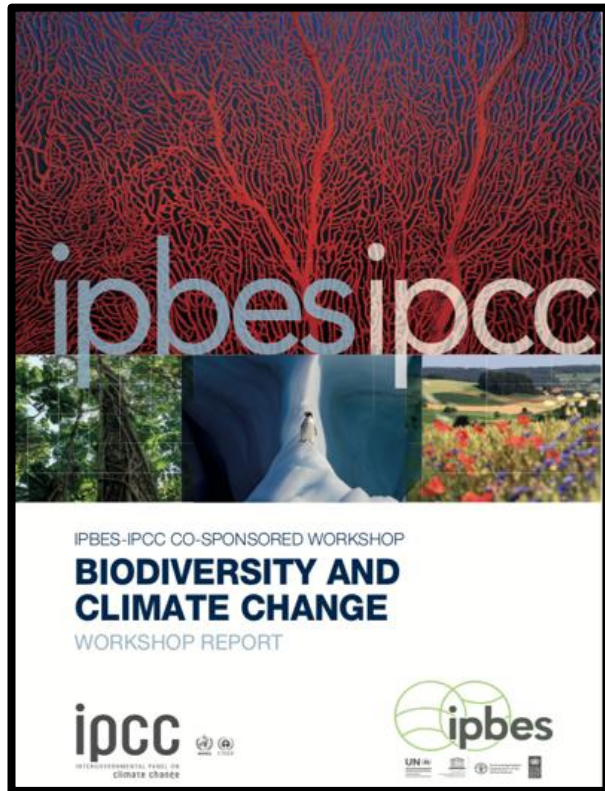
# Interlinkages between biodiversity, climate and agrifood systems

**Paul Leadley**  
Emeritus Professor  
Paris-Saclay University

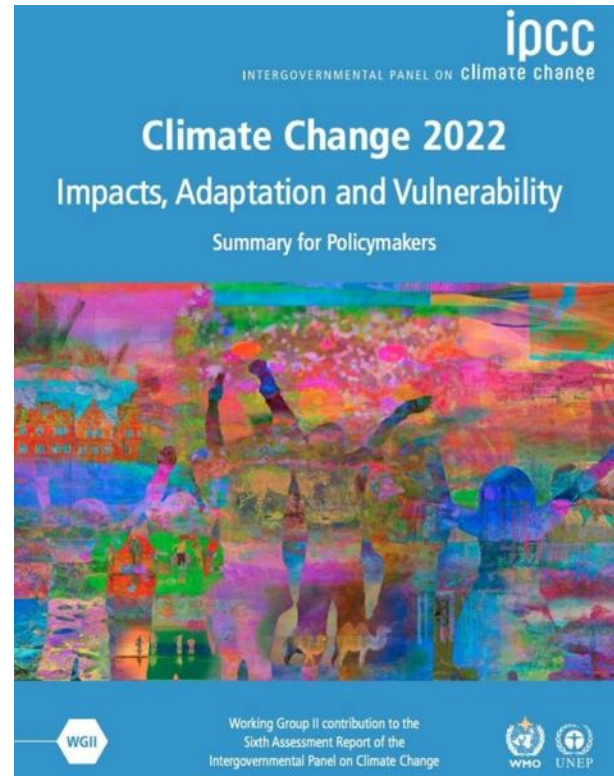
- 1) Messages about these interlinkages in international assessments and reports
- 2) What do meta-analyses tell us about these linkages
- 3) Putting principals into practice



# 1) Key messages about interlinkages between climate, biodiversity and agrifood systems in international assessments and reports



**IPBES-IPCC Workshop Report and Scientific outcome (2021) & IPBES Nexus Assessment (2024)**



**IPCC AR6 WG2 (2022) Impacts, Adaptation and Vulnerability**



**Numerous FAO reports on Climate, Agrifood systems and Biodiversity**

## The IPBES Nexus Assessment (2024): a thematic assessment of the interlinkages among biodiversity, water, food, health and climate change

“Nexus approaches are crucial because, despite the intertwined nature of the drivers and underlying causes of degradation of biodiversity, water, food, health and climate, decisions to address them are often taken in isolation, resulting in potential misalignment, unplanned trade-offs and/or unintended consequences.”

“Implementing response options together or in sequence can enhance nexus-wide benefits, because some response options enable others or amplify their impacts.”

## Climate Adaptation

### IPCC AR6 Working Group II – Summary for Policy Makers

- Effective adaptation options, together with supportive public policies enhance food availability and stability and reduce climate risk for food systems while increasing their sustainability (*medium confidence*).
- **Effective options include cultivar improvements, agroforestry, community-based adaptation, farm and landscape diversification, and urban agriculture** (*high confidence*).
- **Agroecological principles and practices, ecosystem-based management in fisheries and aquaculture, and other approaches that work with natural processes support food security, nutrition, health and well-being, livelihoods and biodiversity, sustainability and ecosystem services** (*high confidence*).
- Institutional feasibility, adaptation limits of crops and cost effectiveness also influence the effectiveness of the adaptation options (*limited evidence, medium agreement*).

## Climate Adaptation

# IPBES-IPCC Report on Biodiversity and Climate change

**Table 4.2 Measures at field and regional scales that can enhance the adaptive capacity of agricultural production systems** (*three entries from a much longer table*)

| Adaptive strategy                             | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Impact on biodiversity                                                                                                          |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>1 Biodiversity-based strategies</b>        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                 |
| <b>Agroecological practices</b>               | Increasing crop and livestock diversity including by using varietal mixes, more complex crop rotations, intercropping, wild relatives for crop and livestock selection, on-farm crop selection, and integrated farming (combining livestock raising with crop and fodder production) have several advantages for climate adaptation especially risk spreading. They also have other advantages including reduction of susceptibility to disease and insect pest attacks. | Agroecological practices are intended to reduce environmental impacts and many practices are based on reinforcing biodiversity. |
| <b>Agroforestry</b>                           | Mixing trees with crops can reduce water and thermal stress for crops in many situations and provides risk spreading if trees or shrubs are used for diversifying income and livelihoods.                                                                                                                                                                                                                                                                                | Enhancing biodiversity is often one of the objectives of agroforestry.                                                          |
| <b>Improving soil biodiversity and health</b> | Reducing tillage, using less pesticides and increasing organic material input enhances the abundance and diversity of soil organisms, and participates in making soils more resistant and resilient in the face of climate change. Combating desertification and soil degradation through management of grazing pressure, vegetation restoration and soil conservation practices at landscape to regional scales can enhance resilience in the face of climate change.   | Soil conservation measures can have large benefits for soil and non-soil biodiversity if done wisely.                           |

## Climate Adaptation

# IPCC AR6 Working Group II

### Chapter 5. Food, Fibre and Other Ecosystem Products

**Table 5.1** | Adaptation strategies assessment in food, fibre and other ecosystem provisioning services. *(NB: two entries from a long table)*

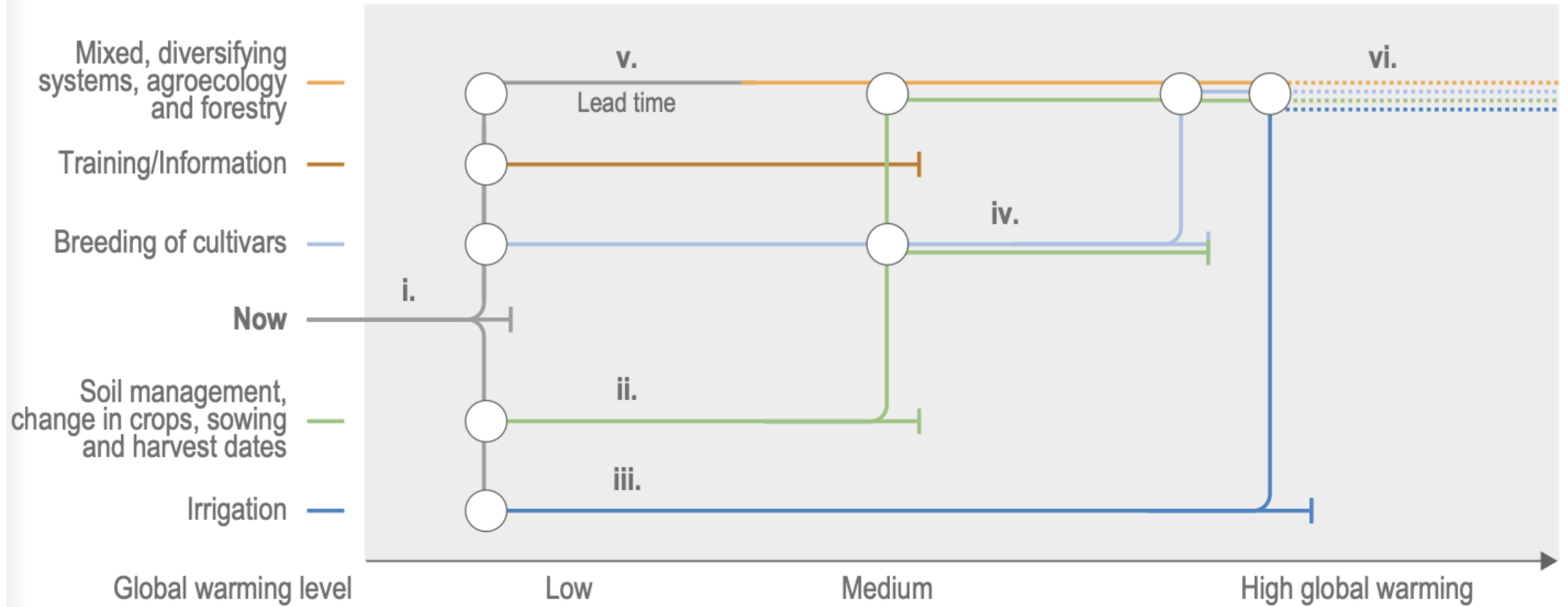
| Adaptation strategies/options                                                                                                                                                                                                                                                                                        | Systems                                                    | Benefits                                                                                                                                                                                                                                       | Constraints or enablers                                                                                                                                                                                                                                                                                                                                                                  | Confidence  | Relevant sections                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>– <b>Ecosystem-based integrated approaches such as agroecology that increase soil organic matter, enhance soil and water conservation, and diversify food production systems</b></li> <li>– <b>Certain types of urban agriculture</b></li> </ul>                              | Crops                                                      | <ul style="list-style-type: none"> <li>– Improve resilience of food systems</li> <li>– Provide mitigation measures and co-benefits in health, ecosystem services and other SDGs</li> <li>– Improve productivity and yield stability</li> </ul> | Secure tenure arrangements are often critical for delivering successful ecosystem-based adaptation                                                                                                                                                                                                                                                                                       | <i>High</i> | (5.4.4.5, 5.6.3, 5.12.3, Cross-Chapter Box NATURAL in Chapter 2, 5.14.3.6, 5.14.3.11; Cross-Chapter Box HEALTH in Chapter 7) |
| <ul style="list-style-type: none"> <li>– <b>Increasing agroecosystem diversification through-expanding crop, animal, fish and other species genetic diversity-varying spatial and temporal arrangements including mixed planting, crop rotations, integrated crop, livestock and agroforestry systems</b></li> </ul> | Crops, livestock, aquaculture, mixed, agroforestry systems | <ul style="list-style-type: none"> <li>– Increase resilience, productivity, and sustainability of farming systems under climate change</li> </ul>                                                                                              | Policies and technologies that support diversification at landscape and farm levels: programmes that reward farmers for diversification practices, reduced incentives for intensified monocultures, extension support and market infrastructure for diverse crops, and productivity research on a greater variety of crops with support for post-harvest processing and regional markets | <i>High</i> | (5.4.4.4, 5.14.3.1, 5.14.3.6)                                                                                                |

## Climate Adaptation

# IPCC AR6 Working Group II

### Chapter 5. Food, Fibre and Other Ecosystem Products




















#### (b) Adaptation pathways agriculture risk



# IPBES-IPCC Report on Biodiversity and Climate change






## Climate Adaptation

**Table 3.1 Effects on biodiversity of selected (example) global climate mitigation and adaptation practices based on land and ocean management. (NB: selected entries in the table)**

| Practice                                  | Summary/synopsis of overall expected impact                                         |                                                                                     |                                                                                      | Mitigation potential                             | Adaptation potential (estimated number of people more resilient to climate change from intervention)                                                                                                                                                                                                                                                                             | Biodiversity impact (positive unless otherwise stated) |
|-------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|                                           | Mitigation potential                                                                | Adaptation potential                                                                | Positive biodiversity impacts                                                        |                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |                                                        |
| Agroforestry                              |    |    |    | 0.1-5.7 Gt CO <sub>2</sub> e a <sup>-1</sup>     | 2300 million people<br>For comparison total anthropogenic release of greenhouse gases from fossil fuel combustion, industry, agriculture, Forestry and Other Land Use (AFOLU), exceed <b>55 GtCO<sub>2</sub>e yr<sup>-1</sup></b><br>Up to 3 billion people<br>>25 million people<br>> 25 million people<br>No global estimates<br>320-400 million people<br>No global estimates | High                                                   |
| Increased soil organic carbon content     |    |    |    | 0.4-8.6 GtCO <sub>2</sub> e a <sup>-1</sup>      |                                                                                                                                                                                                                                                                                                                                                                                  | Medium                                                 |
| Agricultural diversification              |                                                                                     |    |    | > 0                                              |                                                                                                                                                                                                                                                                                                                                                                                  | High                                                   |
| Reforestation and forest restoration      |    |    |    | 1.5-10.1 Gt CO <sub>2</sub> e a <sup>-1</sup>    |                                                                                                                                                                                                                                                                                                                                                                                  | High                                                   |
| Dietary change                            |  |                                                                                     |  | 0.7-8 GtCO <sub>2</sub> e a <sup>-1</sup> (land) |                                                                                                                                                                                                                                                                                                                                                                                  | High <sup>7</sup>                                      |
| Reduced post-harvest losses               |  |  |  | 4.5 GtCO <sub>2</sub> e a <sup>-1</sup>          |                                                                                                                                                                                                                                                                                                                                                                                  | Medium/High                                            |
| Reduced food waste (consumer or retailer) |  |  |  | 0.8-4.5 GtCO <sub>2</sub> e a <sup>-1</sup>      |                                                                                                                                                                                                                                                                                                                                                                                  | Medium/High                                            |

# The IPBES Nexus Assessment: Scenarios synthesis

## A PROJECTED FUTURE IMPACTS ON THE NEXUS ELEMENTS

| Nexus archetype            | Nexus element                                                                                  |                                                                                           |                                                                                          |                                                                                            |                                                                                             | Impacts on each nexus element under each nexus archetype |
|----------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------|
|                            | Biodiversity  | Water  | Food  | Health  | Climate  |                                                          |
| 1. Nature-oriented nexus   | ▲▲▲                                                                                            | ▲▲                                                                                        | ▲                                                                                        | ▲                                                                                          | ▲▲                                                                                          | ▲▲▲ Highly positive                                      |
| 2. Balanced nexus          | ▲                                                                                              | ▲                                                                                         | ▲▲                                                                                       | ▲▲                                                                                         | ▲                                                                                           | ▲▲ Moderately positive                                   |
| 3. Conservation first      | ▲▲                                                                                             | ~                                                                                         | ▼▼                                                                                       | ~                                                                                          | ▲                                                                                           | ▲ Slightly positive                                      |
| 4. Climate first           | ▼                                                                                              | ~                                                                                         | ▼▼                                                                                       | ▲                                                                                          | ▲▲                                                                                          | ~ Variable                                               |
| 5. Food first              | ▼▼                                                                                             | ▼                                                                                         | ▲▲                                                                                       | ▲                                                                                          | ▼▼                                                                                          | ▼ Slightly negative                                      |
| 6. Nature overexploitation | ▼▼                                                                                             | ~                                                                                         | ▼▼                                                                                       | ▼                                                                                          | ▼▼                                                                                          | ▼▼ Moderately negative                                   |
|                            |                                                                                                |                                                                                           |                                                                                          |                                                                                            |                                                                                             | ▼▼ Highly negative                                       |

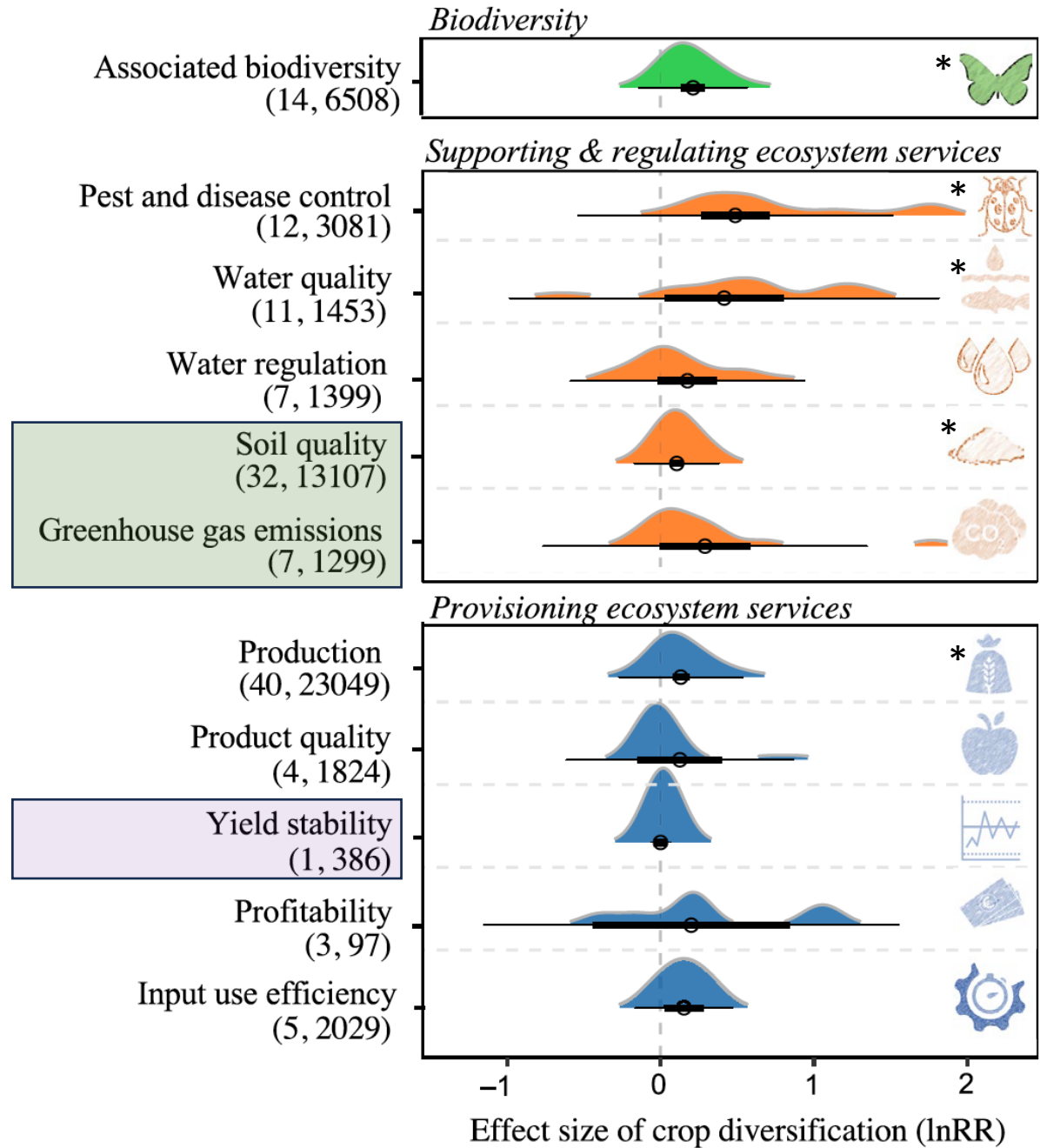
**But there are really big shortcomings of nearly all regional and global scale scenarios and models concerning biodiversity, climate change and agriculture. They tend to strongly favor land sparing over land sharing due to a number of intrinsic biases including:**

- **Very coarse land-use classifications and insufficient representation of land-use intensity**
- **Biodiversity impacts are usually assessed after land allocation has been calculated primarily based on land-sparing logic**
- **The most commonly-used biodiversity metrics tend to favor land sparing over land sharing.**

*E.g., see review of Neumann et al. 2026. One Earth*

***Thesis of Malo Sertillange (C-LAND, ABIES école doc.) aims to address some of these shortcomings (supervisors : Lucile Muneret, Nicolas Guilpart, Antoine Gardarin, Paul Leadley)***

## **2) What do meta-analyses tell us about the interlinkages between biodiversity, climate and agrifood systems**



Increases soil C stocks  
 That's not good, but not significant!

Not conclusive: only one study

## Positive but variable effects of crop diversification on biodiversity and ecosystem services

Beillouin et al. (2021) *Global Change Biology*

Based on 95 meta-analyses including:

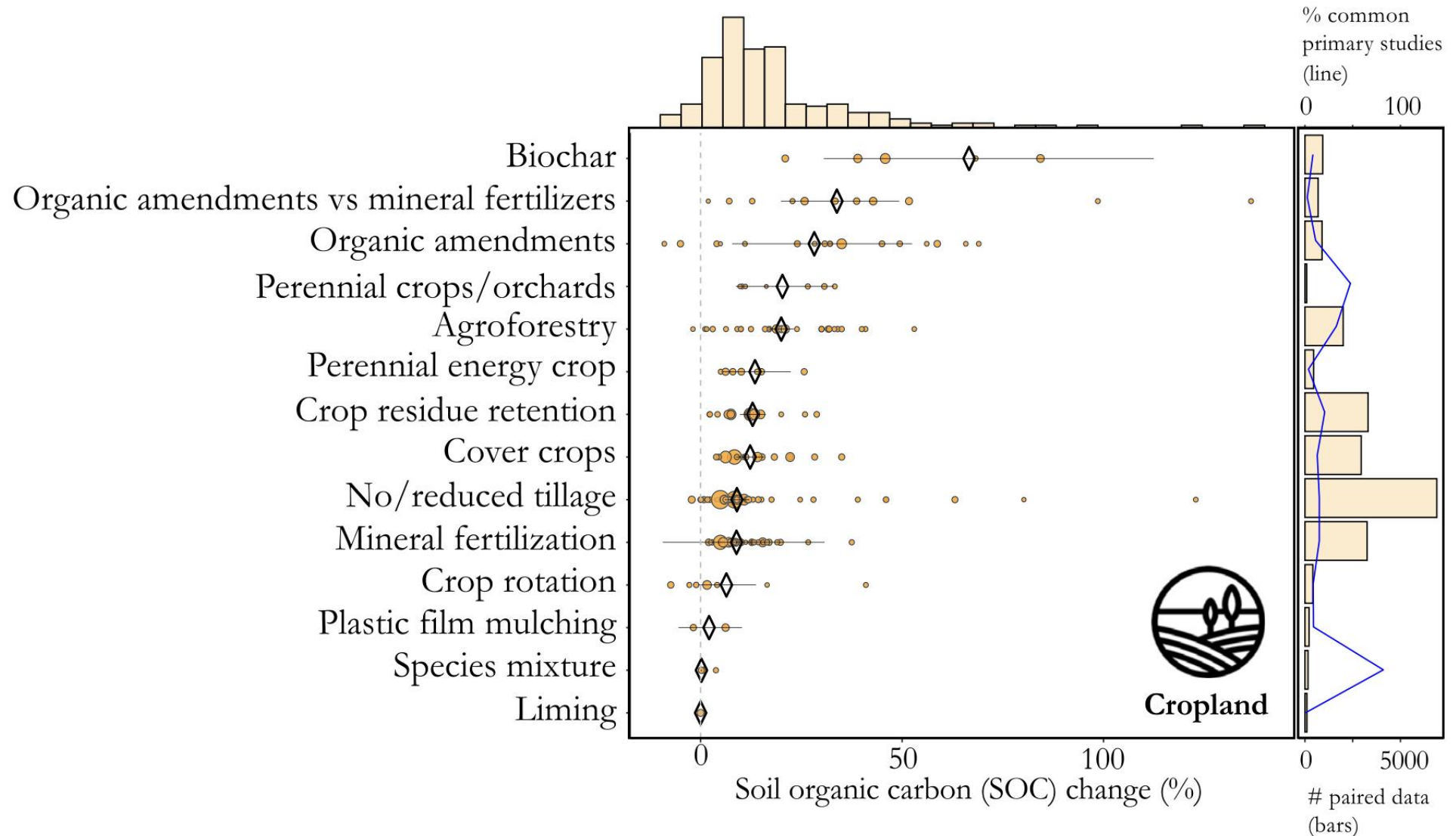
- 5156 experiments
- >54,500 paired observations
- 120 crop species
- 85 countries

\* = significant positive effect

## Climate Mitigation

# A global meta-analysis of soil organic carbon in the Anthropocene

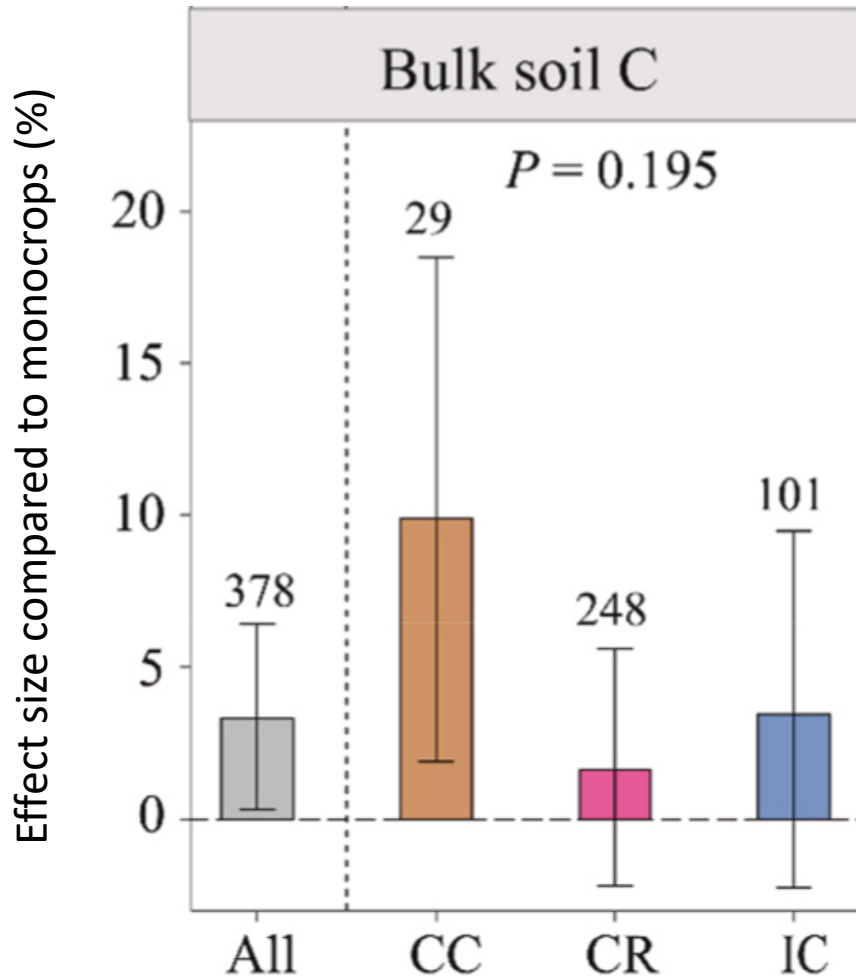
Beillouin et al. (2023). *Nature Communications*



## Climate Mitigation

# Crop diversification promotes soil aggregation and carbon accumulation in global agroecosystems: A meta-analysis

Li et al. (2024) *J. Env. Management*



CC = Cover crop  
CR = Crop rotation  
IC = Intercropping

1924 observations  
from three  
diversification  
strategies

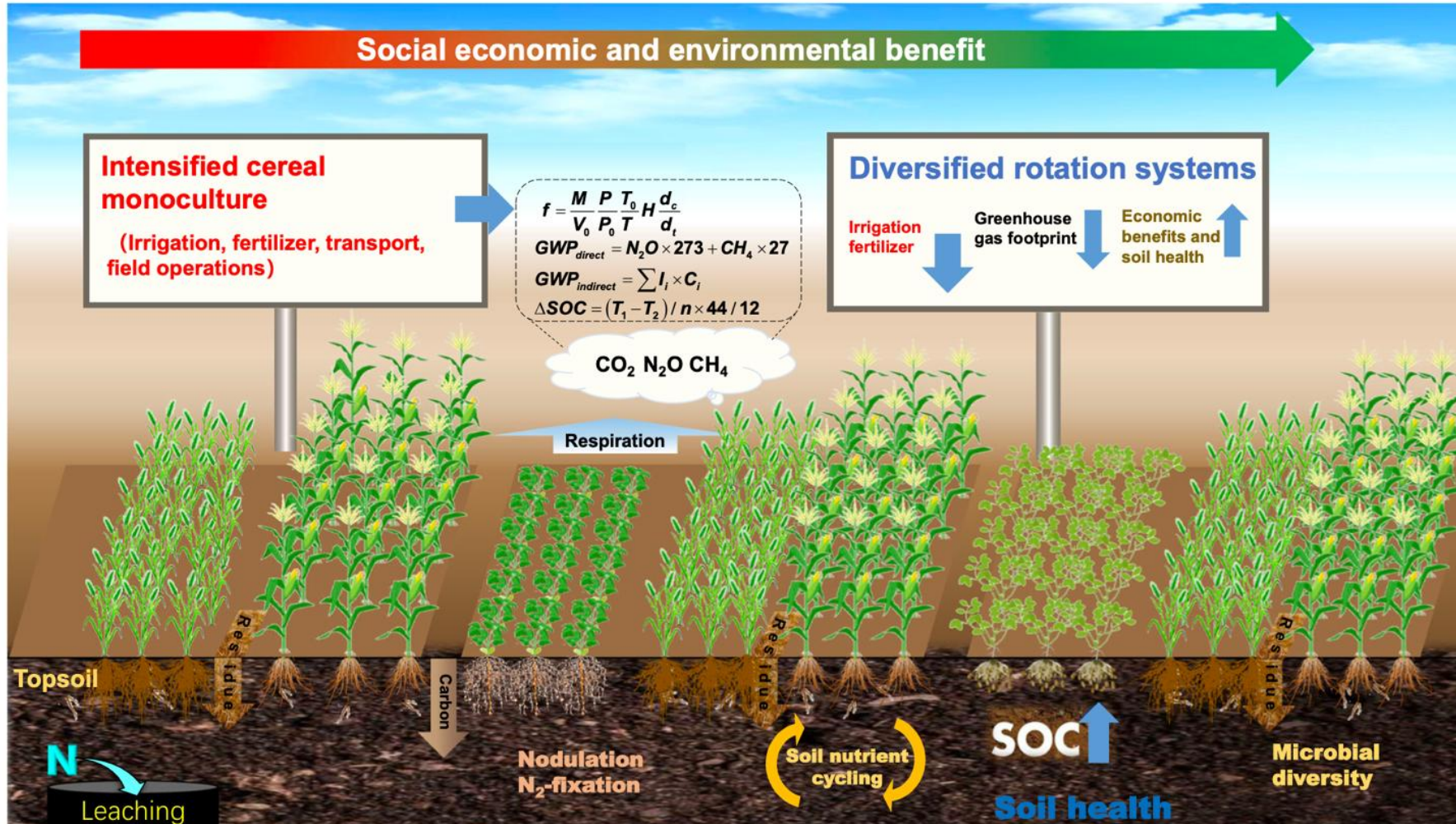
Diversification effect  
is a significant 3.3%  
increase in bulk soil C

Differences between  
diversification types is  
not significant

## Climate Mitigation

# Diversifying crop rotation increases food production, reduces net greenhouse gas emissions and improves soil health

Yang et al. (2024) Nature Comm.



Experiment in China

**Cereal monoculture**  
(wheat–maize)

**Diversified rotation adds**

- sweet potato
- peanut
- soybean

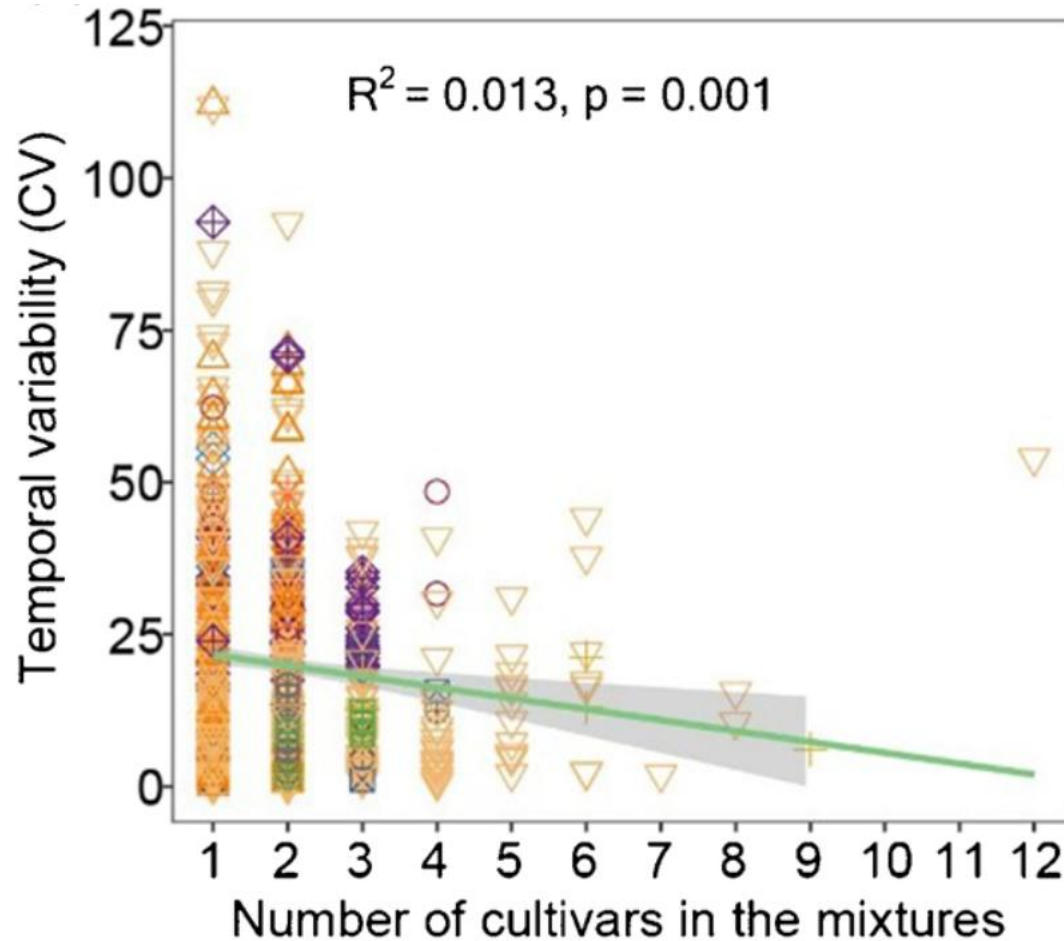
increased yield by up to 38%

improved the system's greenhouse gas balance by 88%.

## Climate Adaptation

# Cultivar mixtures increase crop yields and temporal yield stability globally. A meta-analysis

Huang et al. (2024) *Agronomy for Sustainable Development*



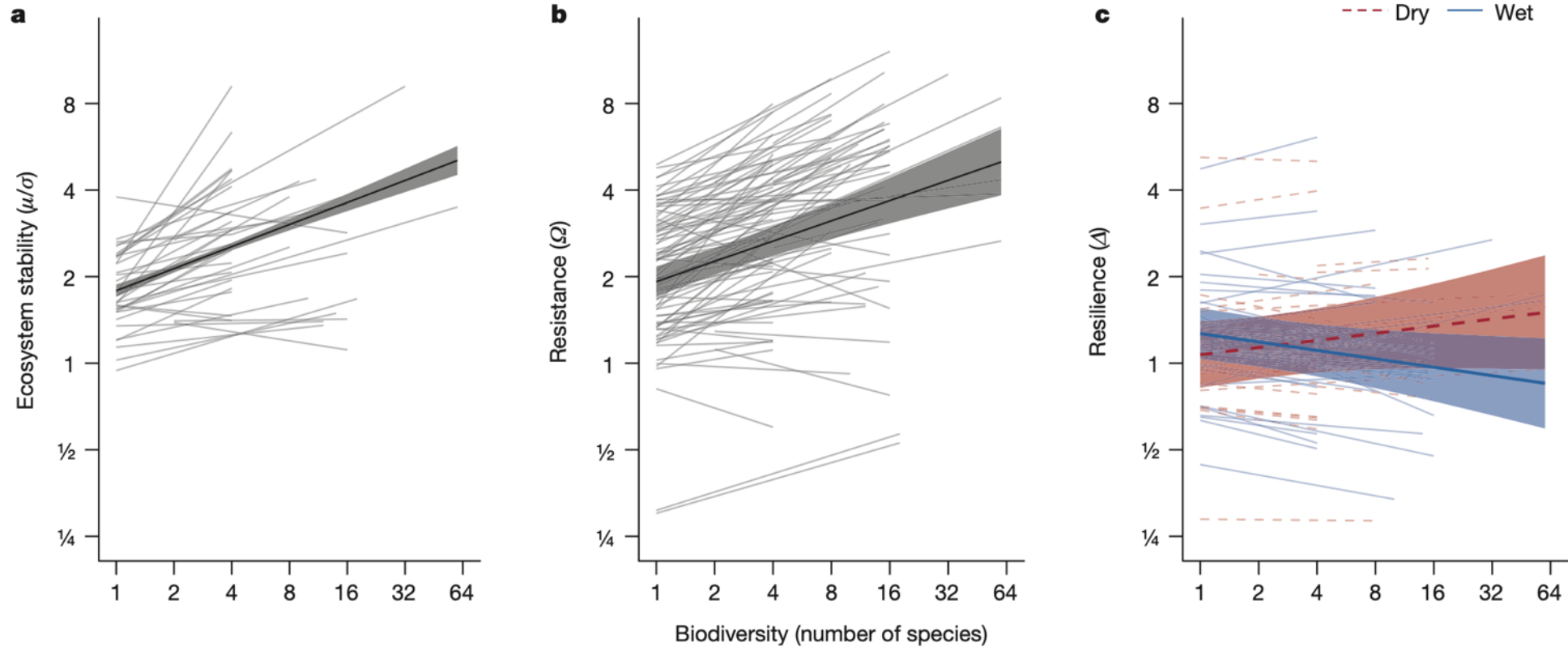
Note that “Cultivar mixtures were more effective in mitigating diseases and increasing yields in studies performed at lower latitudes, higher mean annual temperatures, and higher mean annual precipitation.”

## Climate Adaptation

# Biodiversity increases the resistance of ecosystem productivity to climate extremes

*Isbell et al. (2015) Nature*

Synthesis of manipulations of plant diversity in 46 grassland experiments



Main mechanisms are thought to be “portfolio” or “insurance” effects

## Climate Adaptation

### Towards stability of food production and farm income in a variable climate

*Harkness et al. (2023) Ecological Economics*

#### **Farm income per ha and yields in UK in response to climate variability, subsidies and farm practices / characteristics**

Our results show that variability in temperature and rainfall [*over a 5 year period*] reduces the stability of farm income and food production. While variability in climate can be largely outside of the farmers control our findings indicate that, under current conditions, farm management can have a larger effect on stability than climate.

We identified three key aspects of farm management and policy that improve stability:

- increasing agricultural diversity,
- increasing the efficiency of agrochemical use and
- agri-environmental management.

## **3) Putting principals into practice**



ÉTUDE

« **Résilience agricole** »  
**Vers une agriculture française souveraine, rentable et durable à l'horizon 2050**

Jan 2026

## Study highlights projections of large impacts of climate change on French agriculture and the urgency of adaptation measures

### 4 CATÉGORIES DE LEVIERS PRIORISÉS



#### Diversification des assolements

- Modification et allongement des rotations
- Ajout de légumineuses récoltées
- Extension du couvert interculture



#### Leviers technologiques

- Agriculture de précision
- Amélioration génétique (déjà engagée en grandes cultures)
- Solutions de biocontrôle



#### Nouvelles pratiques culturales, dont agriculture régénérative

- Ajustement des dates et de la densité de semis
- Travail du sol réduit



#### Leviers économiques et organisationnels

- Photovoltaïque sur les bâtiments
- CIVE en interculture pour méthaniseur et récupération du digestat
- Ajout éventuel d'un atelier volaille (poule pondeuse)
- Réintroduction de modèles de polyculture-élevage



ÉTUDE

**« Résilience agricole »**  
**Vers une agriculture française souveraine, rentable et durable à l'horizon 2050**



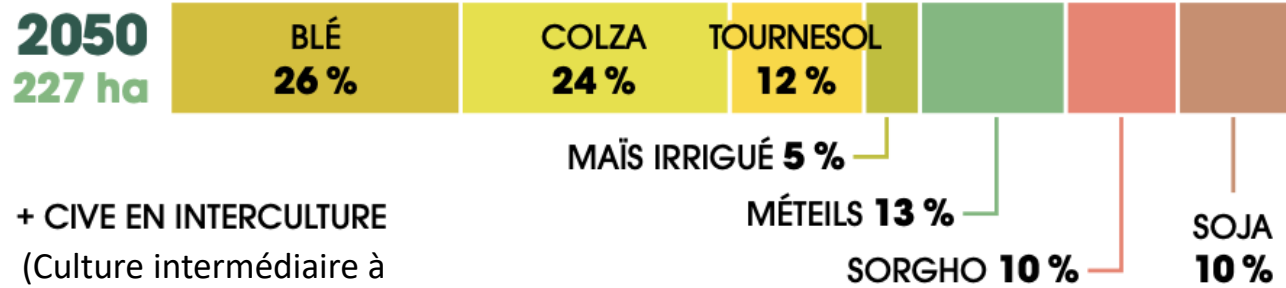
## FOCUS SUR L'ARCHÉTYPE GRANDE CULTURE CENTRE-EST

### MODIFICATION DES ASSOLEMENTS ET ALLONGEMENT DES ROTATIONS

Proposition de culture basée sur les marges brutes et leur résilience à 2050



Accroissement de l'exploitation + 71 ha



+ CIVE EN INTERCULTURE  
(Culture intermédiaire à vocation énergétique)



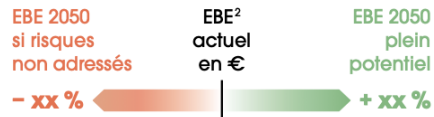
ÉTUDE

**« Résilience agricole »**  
 Vers une agriculture française souveraine, rentable et durable à l'horizon 2050

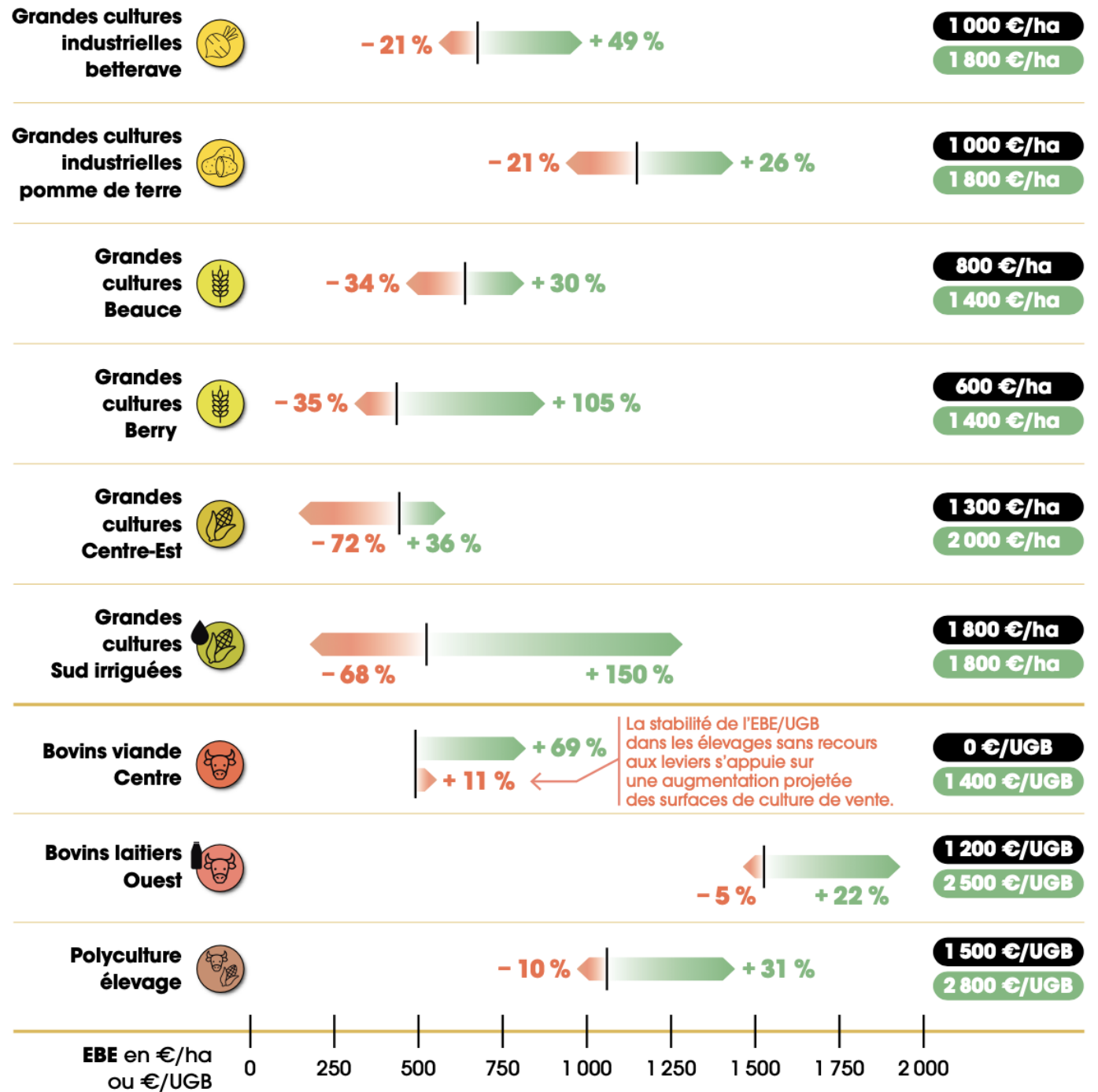


**COÛT DE L'INACTION, BÉNÉFICES DE L'ACTION**

Évolution par archétype des excédents bruts d'exploitation par hectare et par UGB

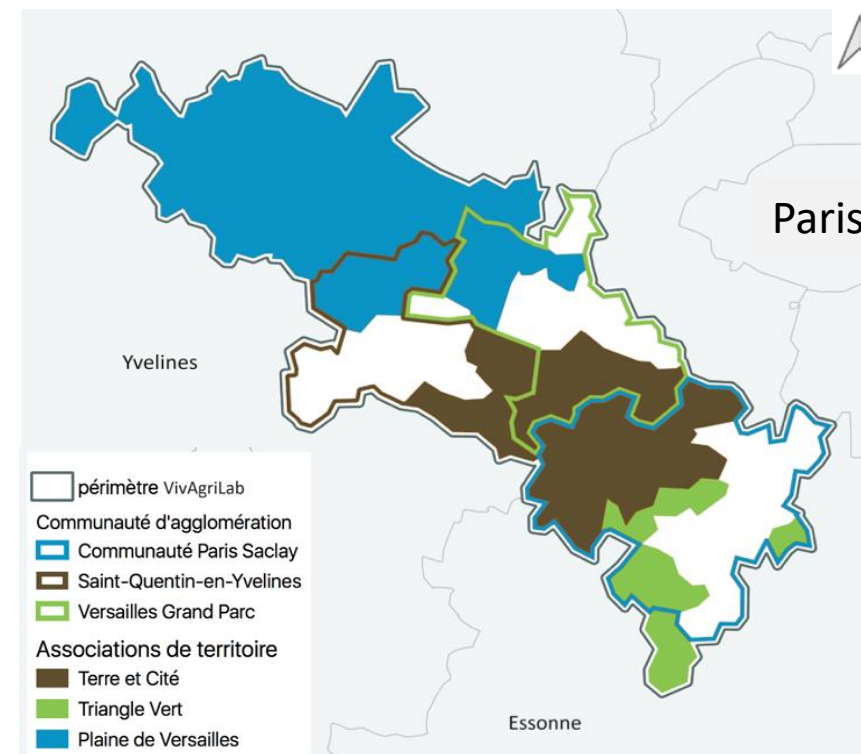


Investissements requis  
 A minima<sup>3</sup> pour maintien de l'EBE actuel **x xxx €/ha**  
 Pour atteindre le plein potentiel **x xxx €/ha**



## Objectives

- Create a **space for cooperation and projects** between stakeholders from all walks of life: researchers, farmers, local authorities and associations in south-western Île-de-France.
- Encourage the **emergence and implementation of applied research projects** in the region and **interdisciplinarity**.
- Provide **practical support for changes in practices, demonstrations and scaling up**, adapting to the needs of local stakeholders, particularly farmers.



**Le VivAgriLab a intégré en février  
2025, le réseau européen :**

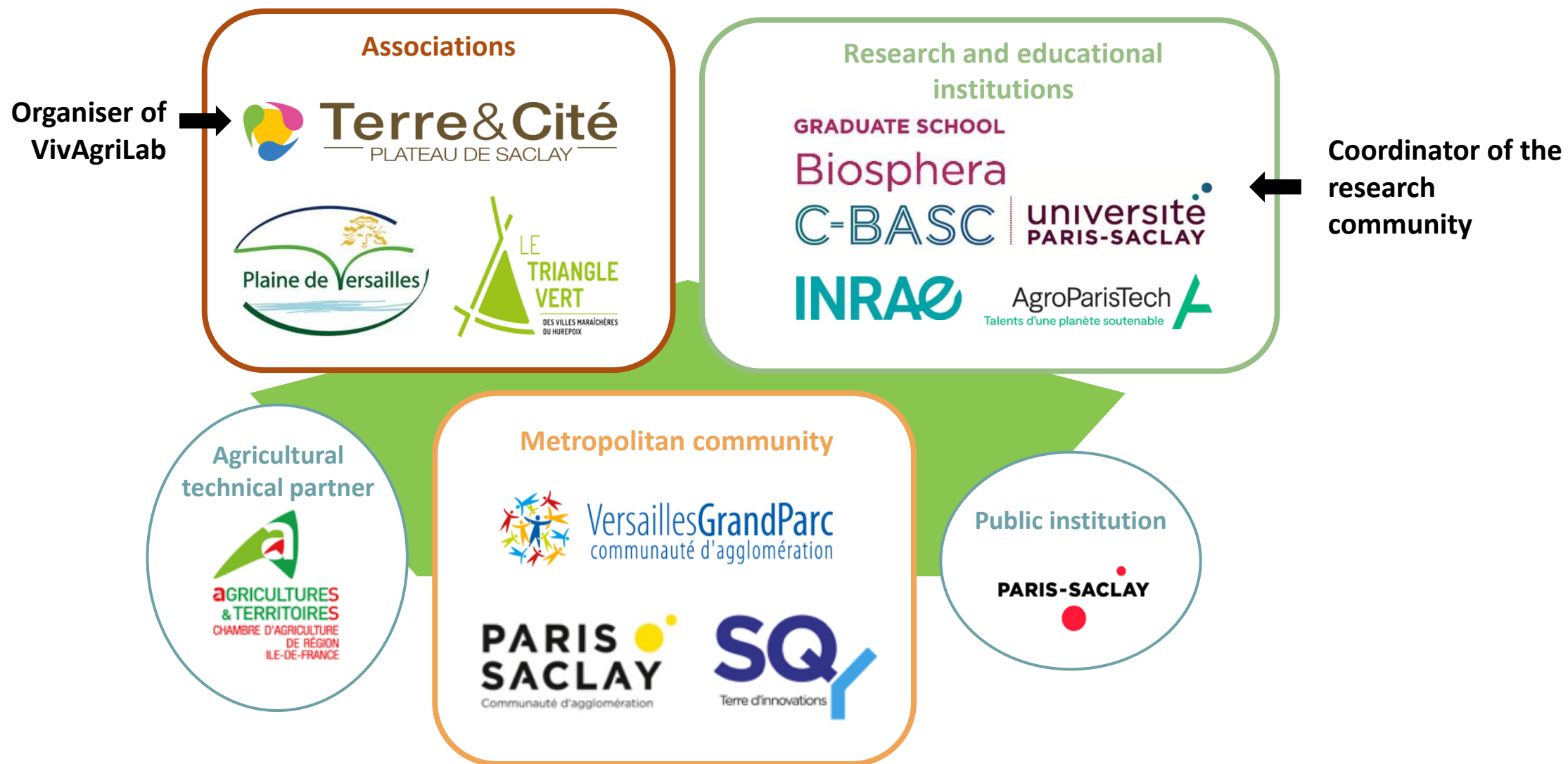


### Key figures:

- 80 municipalities
- 19 300 ha of agricultural land, 1/3 of the total area
- 25% of French agricultural research
- Over 30 research projects implemented



# A robust consortium with a wide range of actors



## Hedges Program on the Saclay Plateau

**Context:** A multi-actor project led by Terre et Cité involving farmers, citizens, students, researchers, towns, advisory institutions, etc. Initiated by a Terre et Cité and a small group of farmers. Interest grew rapidly. Motivations of actors vary greatly among because hedges provide such a broad array of ecosystem services.

### **Hedges program:**

- >10 kilometers of hedges have been planted
- 16 farms and towns involved in the project
- 20,000 trees to be planted on the Saclay Plateau
- Multi-actor strategy for long-term maintenance
- Other areas in VivAgriLab now interested in participating

### **Research and Teaching:**

- Created an opportunity for field course on hedges and ecological continuities for Masters programs. Also mobilizes students for planting trees and monitoring biodiversity.
- C-BASC facilitated participation discussions which lead to the YNC-Haies “Yield, Nitrogen, and soil Carbon impacts of hedges” thesis project

### **A foundation for related biodiversity and agroecology initiatives:**

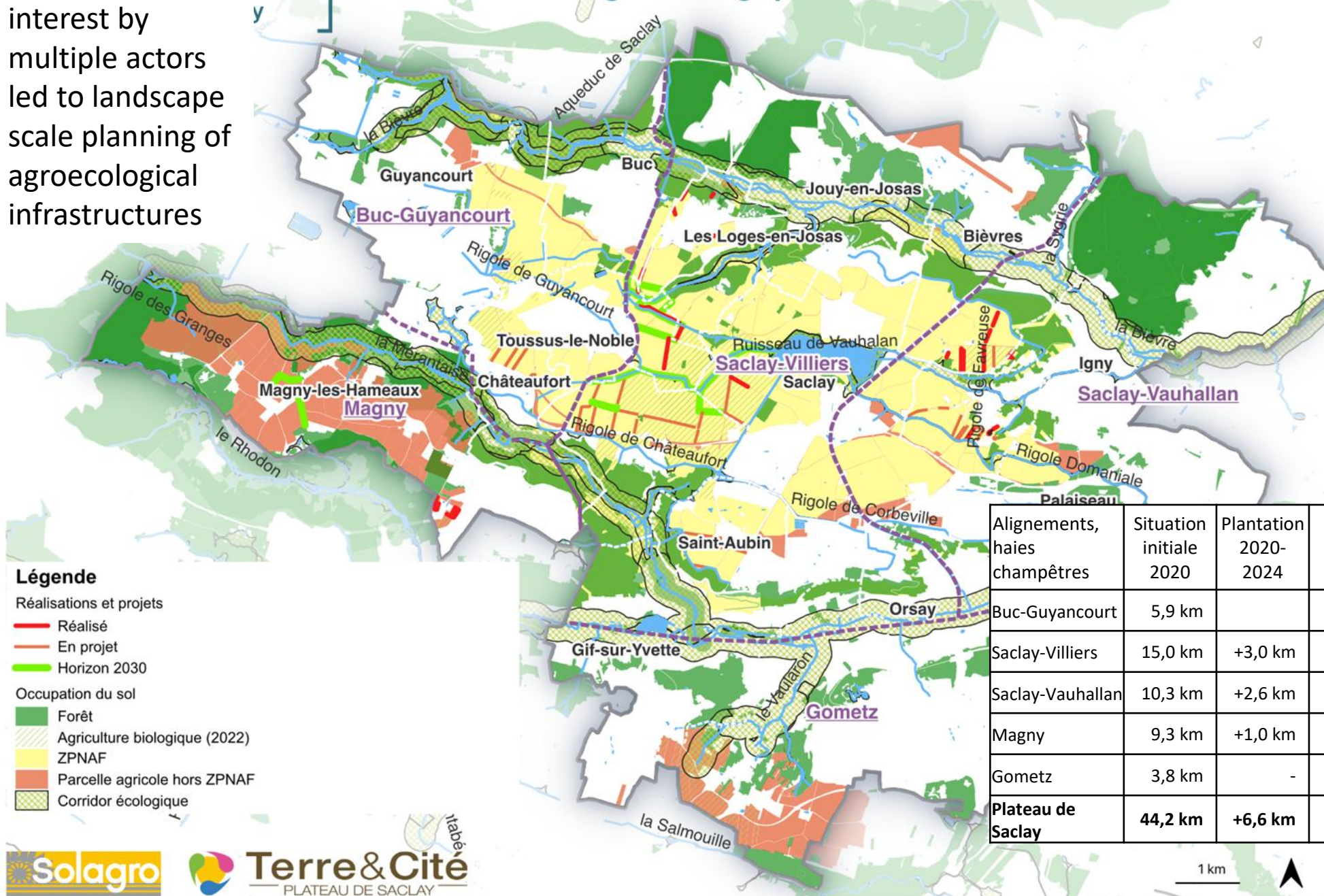
- Solagro has provided at territorial vision and timetable for conservation and creation of agroecological infrastructure and ecological continuities for the Saclay Plateau and surroundings (Spring 2025)



*Chantier de plantation de haie sur le plateau de Saclay  
Avec l'aide d'Afac-Agroforesteries  
(=Réseau Haies France depuis 2025)*

Rapidly growing interest by multiple actors led to landscape scale planning of agroecological infrastructures

## Infrastructures agroécologiques : Ambition 2020-2030



- Recréer une connexion centrale en prolongeant les actions de plantation réalisées

- Expérimenter d'autres IAE s'appuyant sur la trame bleue (bandes enherbées et fleuries : démarche Végétal Local, brossage de prairies naturelles pour filière de semences).

**Légende**

Réalisations et projets

- Réalisé
- En projet
- Horizon 2030

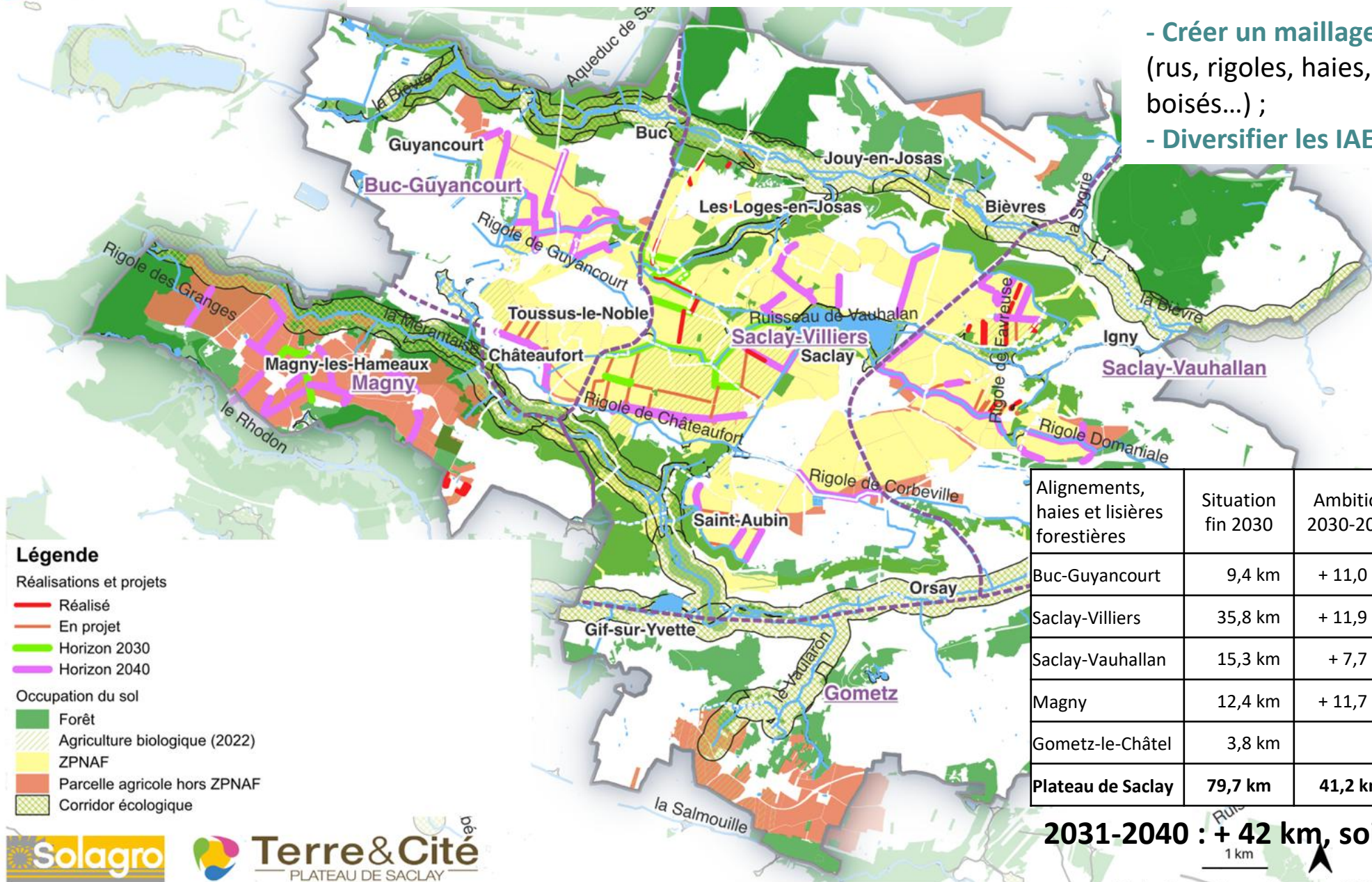
Occupation du sol

- Forêt
- Agriculture biologique (2022)
- ZPNAF
- Parcelle agricole hors ZPNAF
- Corridor écologique

| Alignements, haies champêtres | Situation initiale 2020 | Plantation 2020-2024 | Projets 2025-2026 | Projets 2027   | Ambition 2028-2030 | Variation 2020-2030 |
|-------------------------------|-------------------------|----------------------|-------------------|----------------|--------------------|---------------------|
| Buc-Guyancourt                | 5,9 km                  |                      | +1,3 km           | +2,2 km        | -                  | +3,5 km             |
| Saclay-Villiers               | 15,0 km                 | +3,0 km              | +5,1 km           | +1,6 km        | +9,1 km            | +18,8 km            |
| Saclay-Vauhallan              | 10,3 km                 | +2,6 km              | +2,3 km           | +0,1 km        | -                  | +5,0 km             |
| Magny                         | 9,3 km                  | +1,0 km              | -                 | -              | +2,1 km            | +3,1 km             |
| Gometz                        | 3,8 km                  | -                    | -                 | -              | -                  | -                   |
| <b>Plateau de Saclay</b>      | <b>44,2 km</b>          | <b>+6,6 km</b>       | <b>+8,7 km</b>    | <b>+4,0 km</b> | <b>+11,2 km</b>    | <b>+30,5 km</b>     |

# Ambition 2030-2040 : Multiplier les connexions et diversifier les IAE

- Créer un maillage d'IAE connectées entre-elles (rus, rigoles, haies, bandes fleuries, vallons boisés...);
- Diversifier les IAE à grande échelle



**Légende**

Réalisations et projets

- Réalisé
- En projet
- Horizon 2030
- Horizon 2040

Occupation du sol

- Forêt
- Agriculture biologique (2022)
- ZPNAF
- Parcelle agricole hors ZPNAF
- Corridor écologique

| Alignements, haies et lisières forestières | Situation fin 2030 | Ambition 2030-2040 | Situation en 2040 | Gain de linéaire de haies | Densité IAE en 2040 (ml/ha) |
|--------------------------------------------|--------------------|--------------------|-------------------|---------------------------|-----------------------------|
| Buc-Guyancourt                             | 9,4 km             | + 11,0 km          | 18,4 km           | +117%                     | 43                          |
| Saclay-Villiers                            | 35,8 km            | + 11,9 km          | 47,7 km           | +35%                      | 45                          |
| Saclay-Vauhallan                           | 15,3 km            | + 7,7 km           | 23,0 km           | +45%                      | 48                          |
| Magny                                      | 12,4 km            | + 11,7 km          | 24,1 km           | +95%                      | 57                          |
| Gometz-le-Châtel                           | 3,8 km             | -                  | 3,8 km            | -                         | 35                          |
| <b>Plateau de Saclay</b>                   | <b>79,7 km</b>     | <b>41,2 km</b>     | <b>120,9 km</b>   | <b>+51%</b>               | <b>46</b>                   |

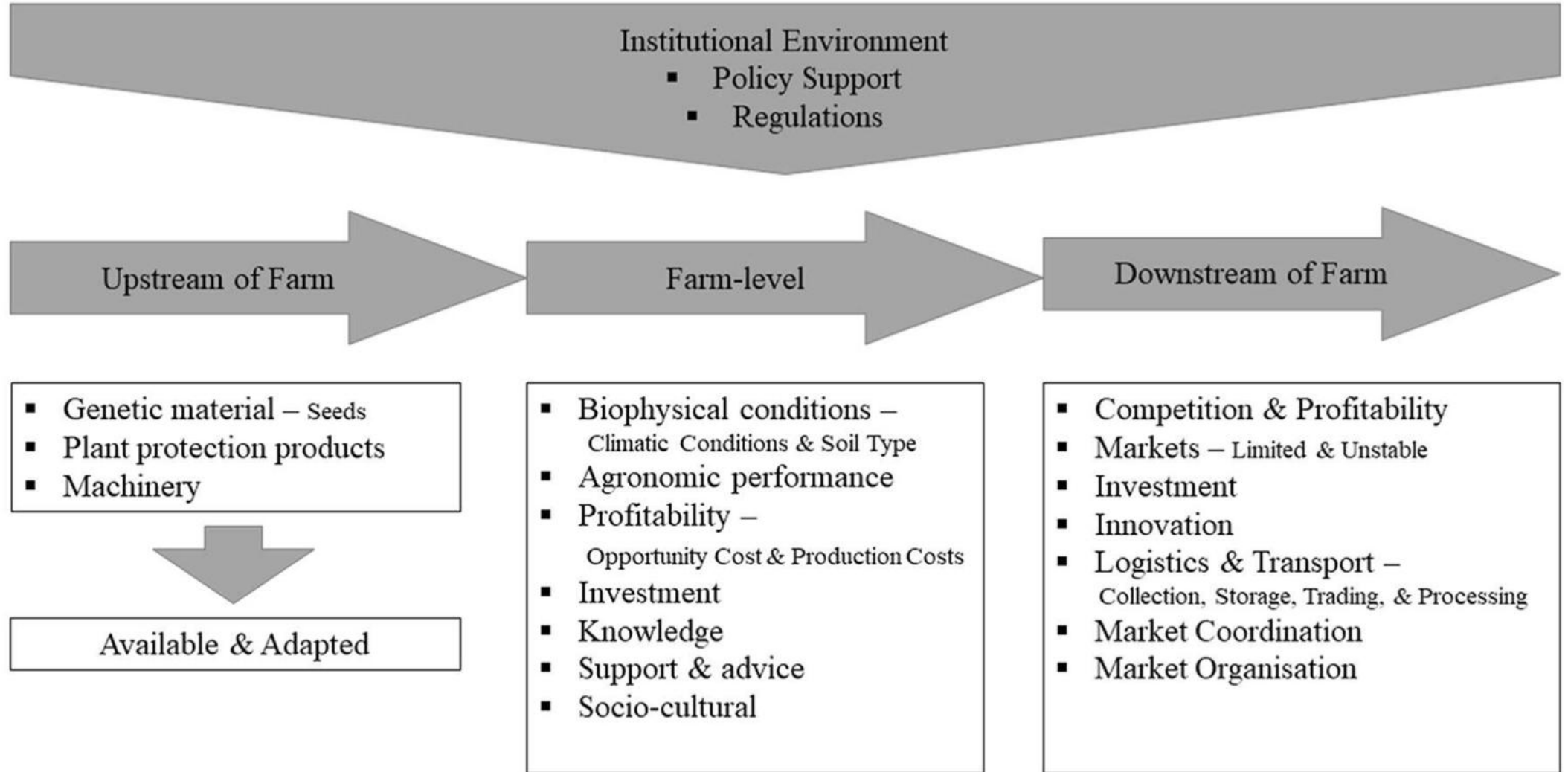
**2031-2040 : + 42 km, soit +32% d'IAE / 2030**

## Examples of research projects funded in part by C-BASC within the perimeter of VivAgriLab

|           | Themes               | Principal investigators and labs                                                                               |                                    |
|-----------|----------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------|
| 2021-2025 | Flux local           | Circularité de la matière organique, <b>diversification</b> agricole, offre/demande <b>alimentaire</b> durable | ECOSYS, SADAPT, Sayfood            |
|           | ClimaLeg (EU LEADER) | <b>Adaptation</b> des cultures <b>légumières</b> au changement climatique                                      | C. Aubry, K. Morel (SADAPT)        |
|           | Périjardins          | Potentiel des <b>jardins</b> pour la biodiversité                                                              | E. Baudry (ESE), R. Melot (SADAPT) |
|           | Vergers européens    | Impact du sol et du changement climatique sur les <b>pommiers</b>                                              | A. Cornille (GQE)                  |
|           | MedUrinAgri          | <b>Urine</b> humaine comme fertilisant                                                                         | M. Deschamp (ECOSYS)               |
|           | ClimaLegEau          | Disponibilité future en <b>eau</b> pour le <b>maraichage</b>                                                   | N. Touili (SADAPT)                 |
|           | Galcirse             | Comment réguler les <b>cirses</b> ?                                                                            | A. Ressayre (GQE)                  |

# Overcoming barriers to crop diversification uptake in Europe

Brannan et al. (2023)

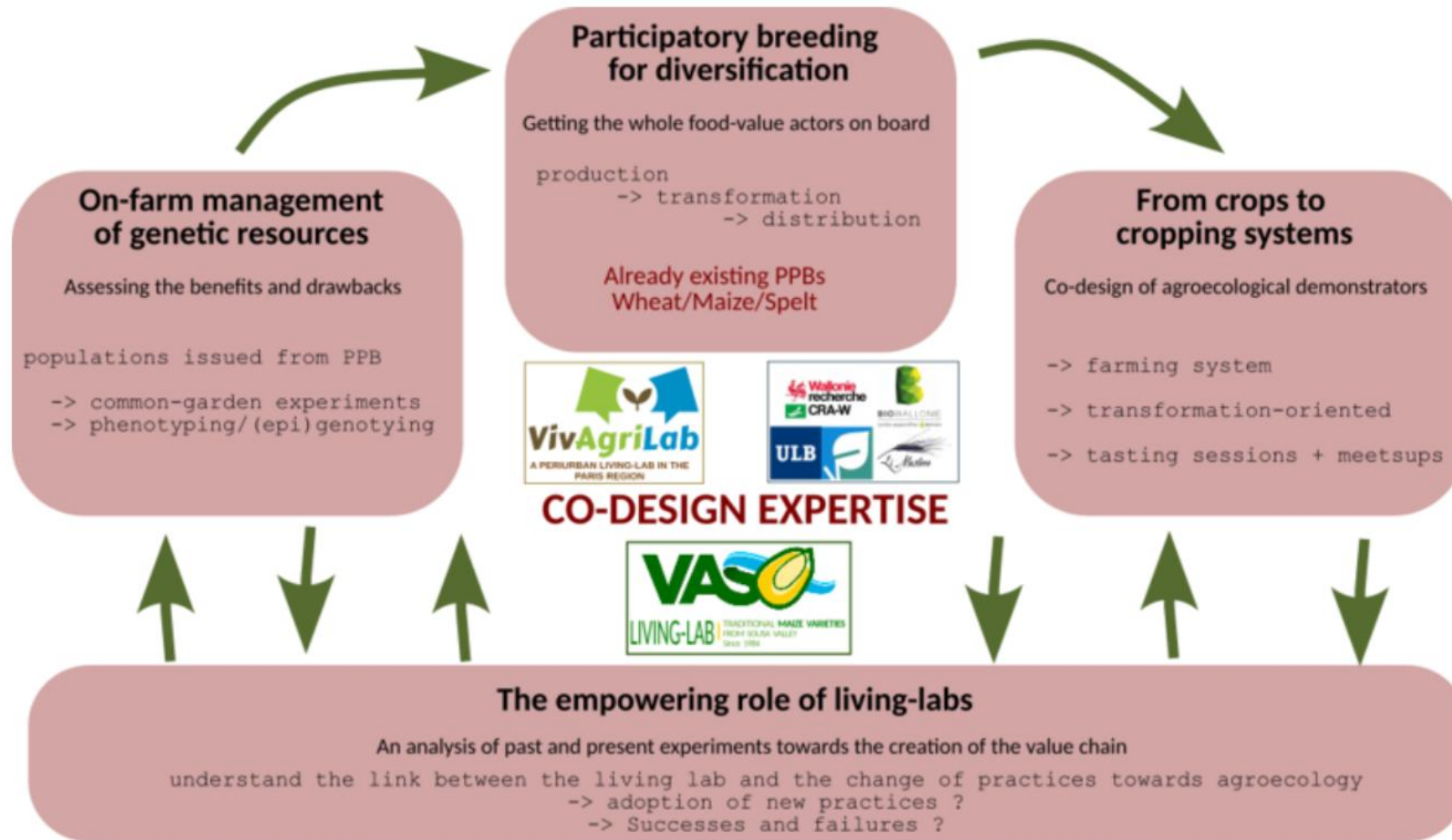


# OnFarmDiv

Crop diversification on farms to support the agroecological transition

Project led by GQE-Le Moulon

Submitted to



## Conclusions

- Agricultural systems need to be transformed in order to reduce their contribution to climate change and to adapt to climate change.
- Practices that increase biodiversity in agricultural systems at field to landscape levels can contribute greatly to meeting multiple goals for agriculture including climate adaptation and climate mitigation, but are greatly underused.
- Many biodiversity-based climate adaptation strategies for agriculture, such as crop diversification and agroforestry, are currently developed by farmers with relatively little input from research or advisory institutions.
- There is an urgent need for researchers to work with farmers and the full set of actors in the food value chain to help overcome the barriers that are preventing broader adoption of “biodiversity friendly” practices.



# Thanks!

*Southern Ground-Hornbill, South Africa*

*Photo: P. Leadey & A. Larigauderie*