

# Agroecology from plants to systems

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UCLouvain– Sytra

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# Outline

- **Agroecology is not for scientists**
- **Coping with scale in agroecological transitions**
- **The key role of modellers**

# Agroecology is not for scientists











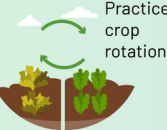
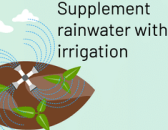













# Agroecology is not for scientists



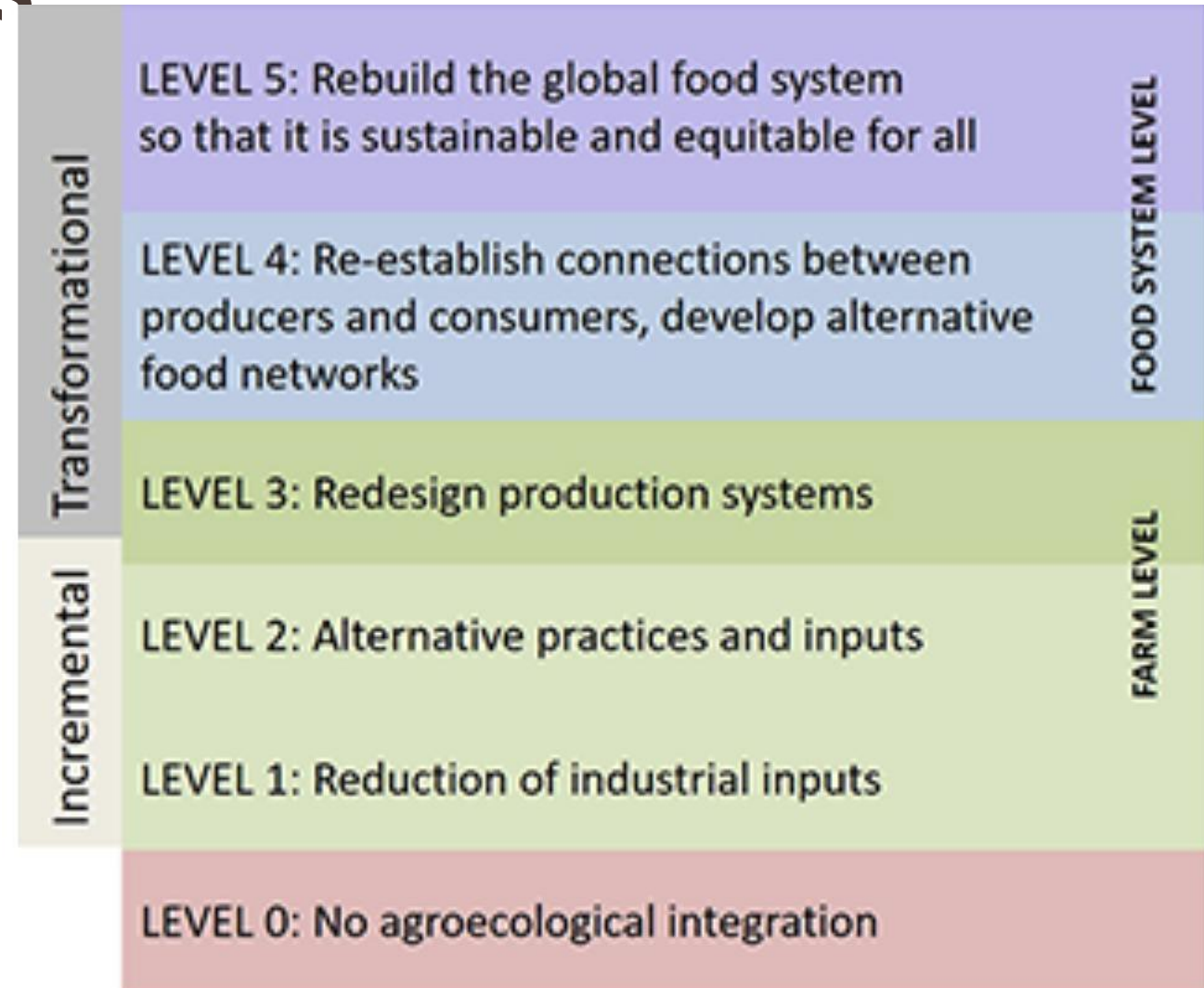
ILLUSTRATIONS: DOROTTYA POÓR

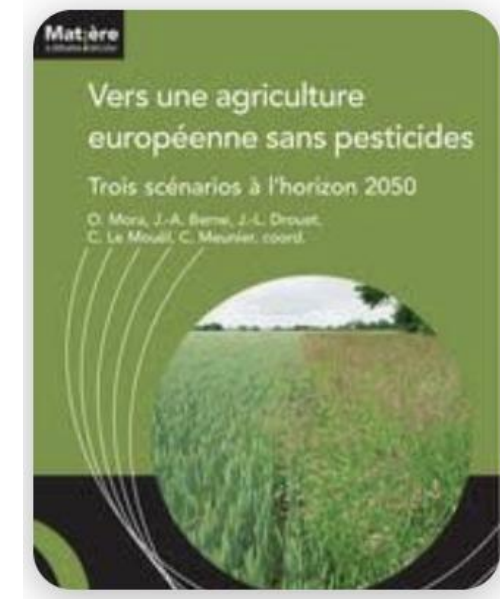
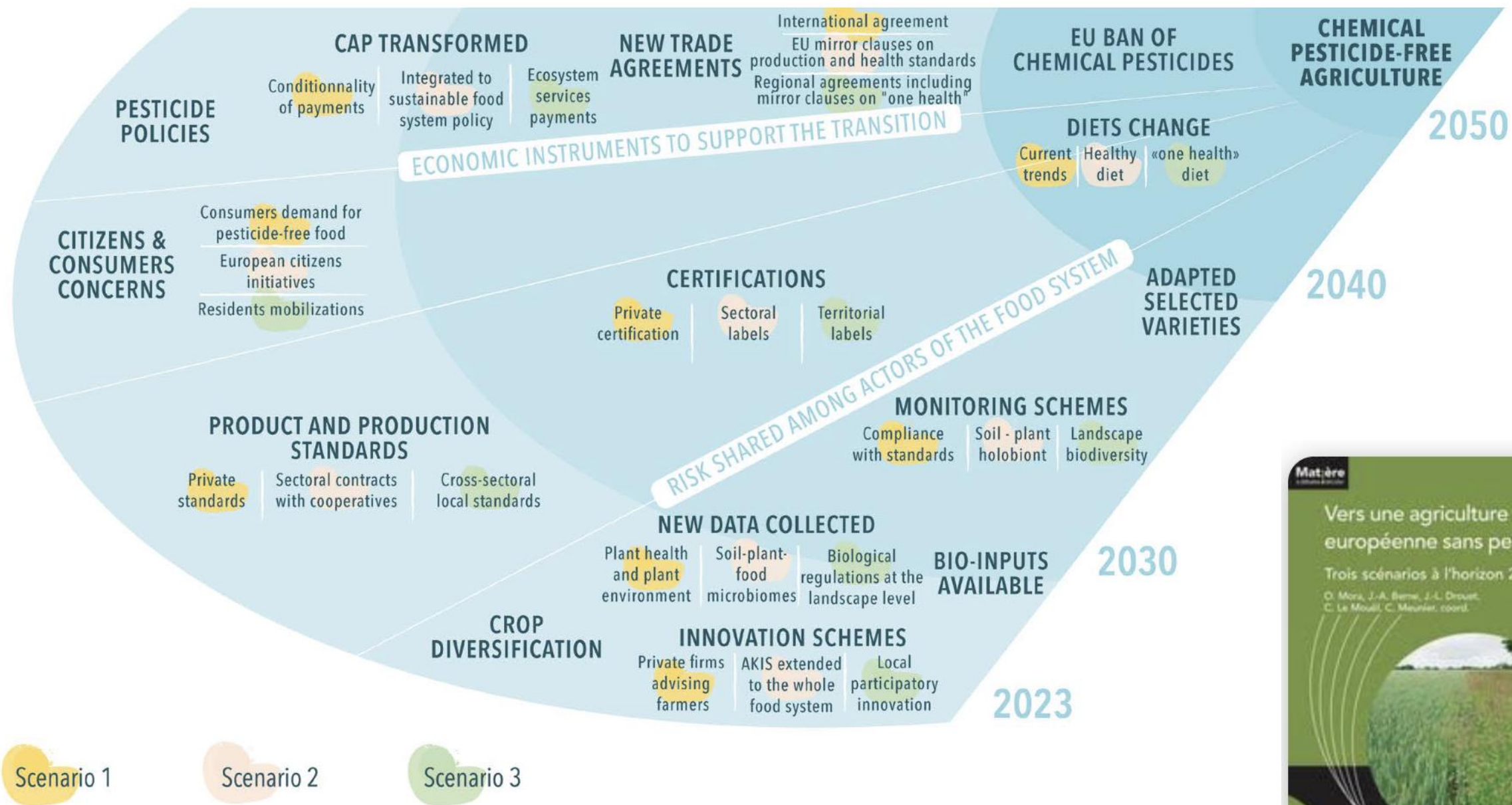
# Agroecology as a set of practices

AGROECOLOGICAL PRINCIPLES	HOW HAVE BEEN ADOPTED BY MOST LEAFY VEGETABLE FARMERS IN KIAMBU COUNTY				
<b>Recycling</b> 	 <p>Reuse kitchen water for vegetable irrigation</p>	 <p>Generate biogas from livestock waste</p>	 <p>Use crop residues for mulching and compost</p>		
<b>Input reduction</b> 	 <p>Use rabbit urine as a biofertilizer</p>	 <p>Incorporate crop residue back into the soil</p>	 <p>Use organic manures and biopesticides</p>		
<b>Soil health</b> 	 <p>Use of organic inputs in their production</p>	 <p>Practice crop rotation</p>	 <p>Supplement rainwater with irrigation</p>	 <p>Intercropping with leguminous crops that fix nitrogen</p>	 <p>Planting trees and cover crops to reduce soil erosion and improve shading</p>
<b>Biodiversity</b> 	 <p>Livestock production Keep different livestock species</p>	 <p>Crop production Growing a variety of crops including vegetables</p>	 <p>Agroforestry</p>		
<b>Animal health</b> 	 <p>Proper feeding practices</p>	 <p>Proper vaccination</p>			
<b>Economic diversification</b> 	 <p>Improve and diversify income sources Sell vegetables and other crop and livestock products</p>				

<https://alliancebiodiversityciat.org/stories/finding-agroecology-practice-vegetable-farms-kiambu-county-kenya>

# Agroecological transition is not a sum of agroecological practices





**Figure 15.** Robust elements of a transition pathway towards chemical pesticide-free agriculture

A photograph of a cow grazing in a field. The cow is in the foreground, facing away from the camera. In the background, another cow is grazing. The scene is hazy, suggesting a misty or foggy day. The text "Coping with scale in agroecological transitions" is overlaid on the image in white, bold, sans-serif font.

**Coping with scale in agroecological  
transitions**

# ANTON RIERA

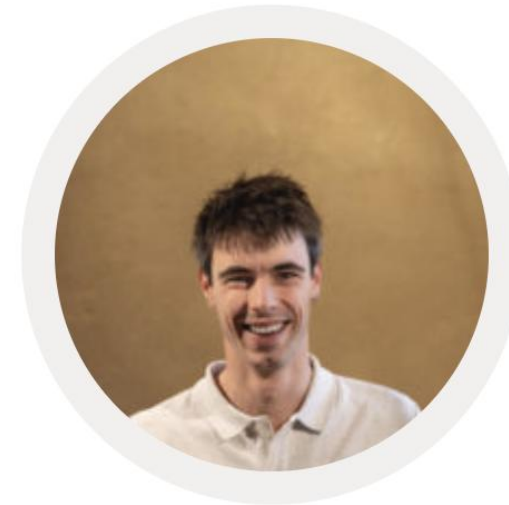
Research assistant

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**Unpacking food system  
transitions across  
multiple scales**

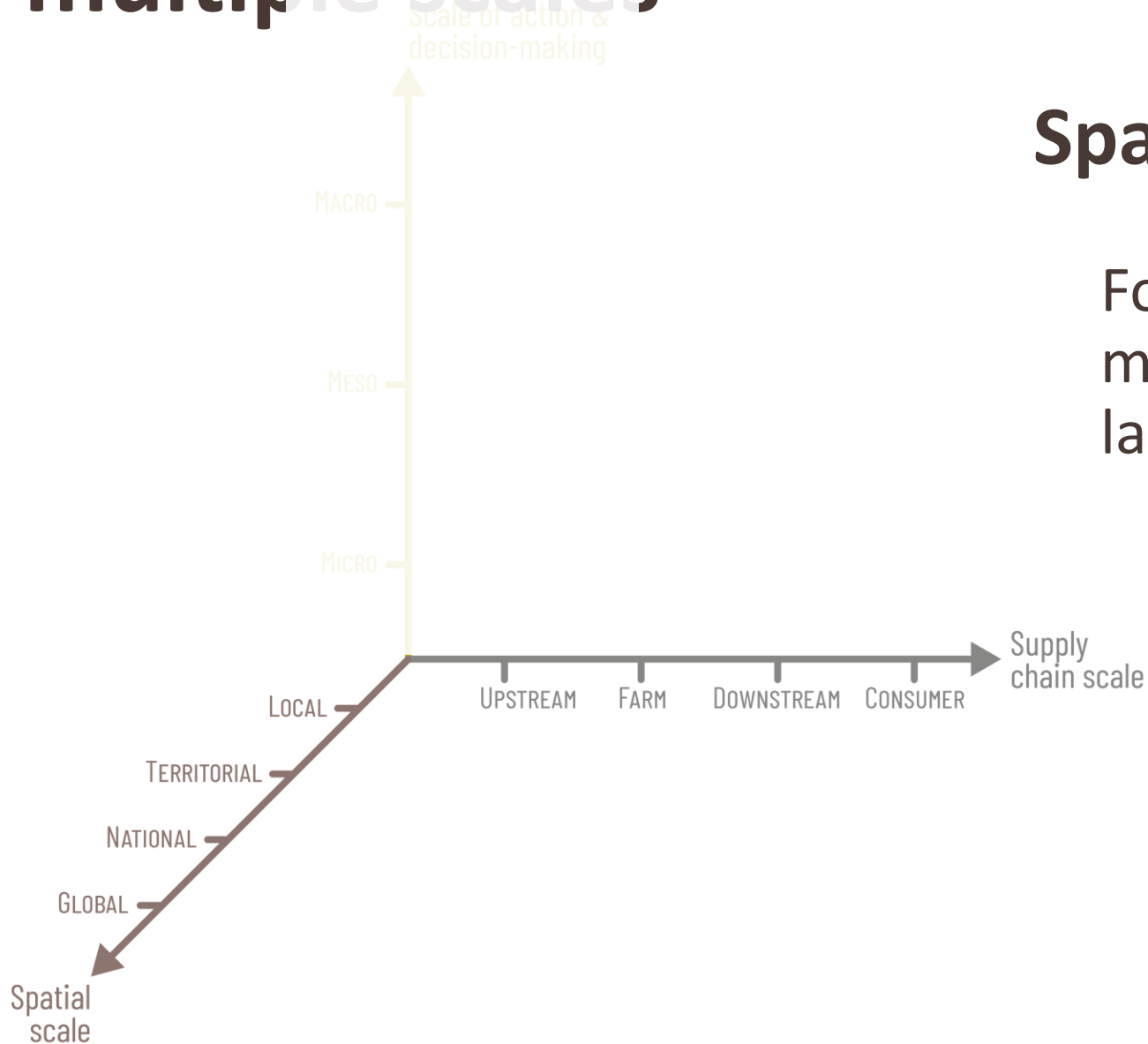
The Belgian livestock sector

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<https://sytra.be/publication/phd-anton-riera-unpacking-transitions-across-multiple-scales/>

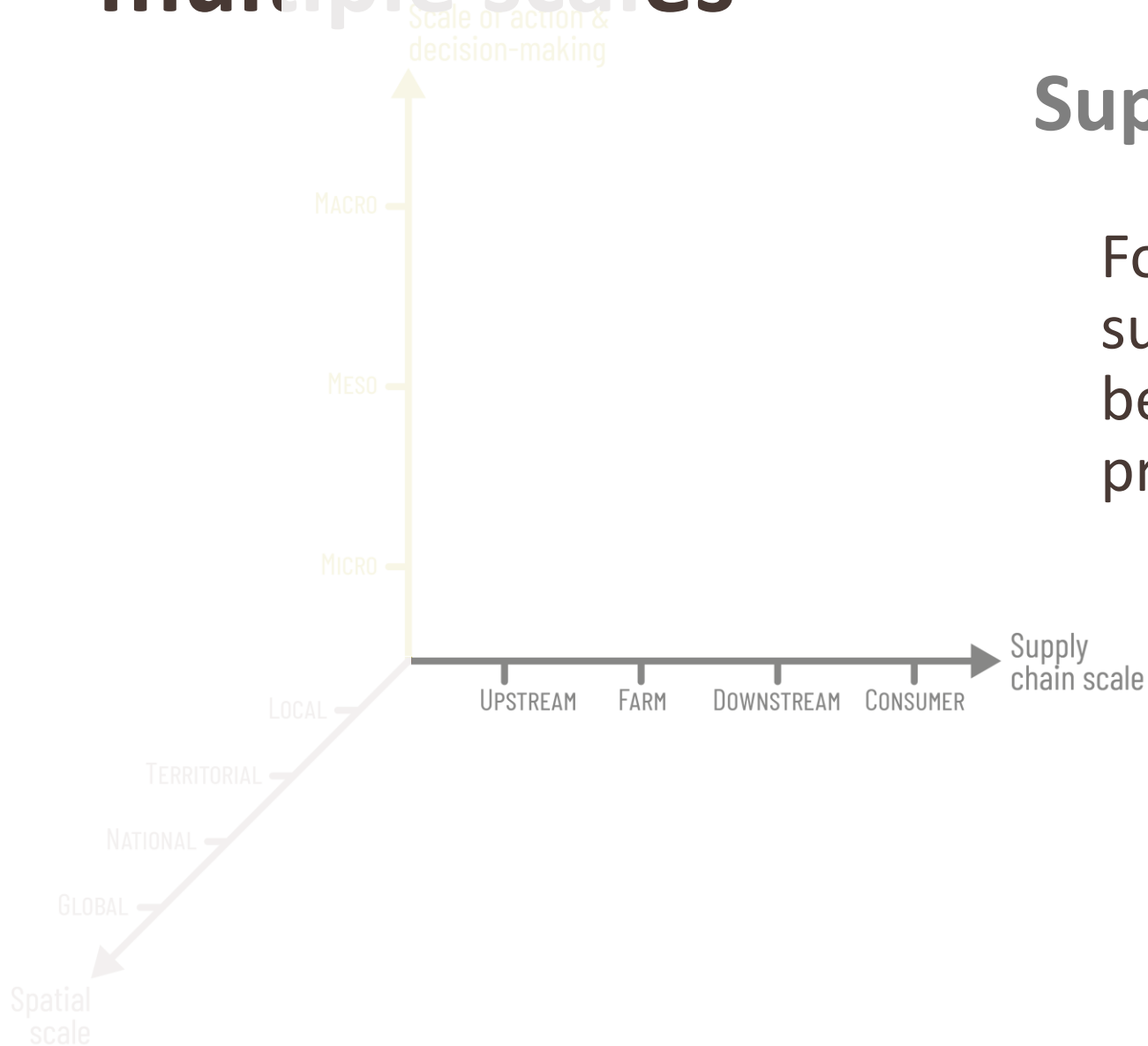
# Conceptualising food system transitions at multiple scales



## Spatial scale

Food system transitions include multiple spatial scales from local, to landscape and territorial to global.

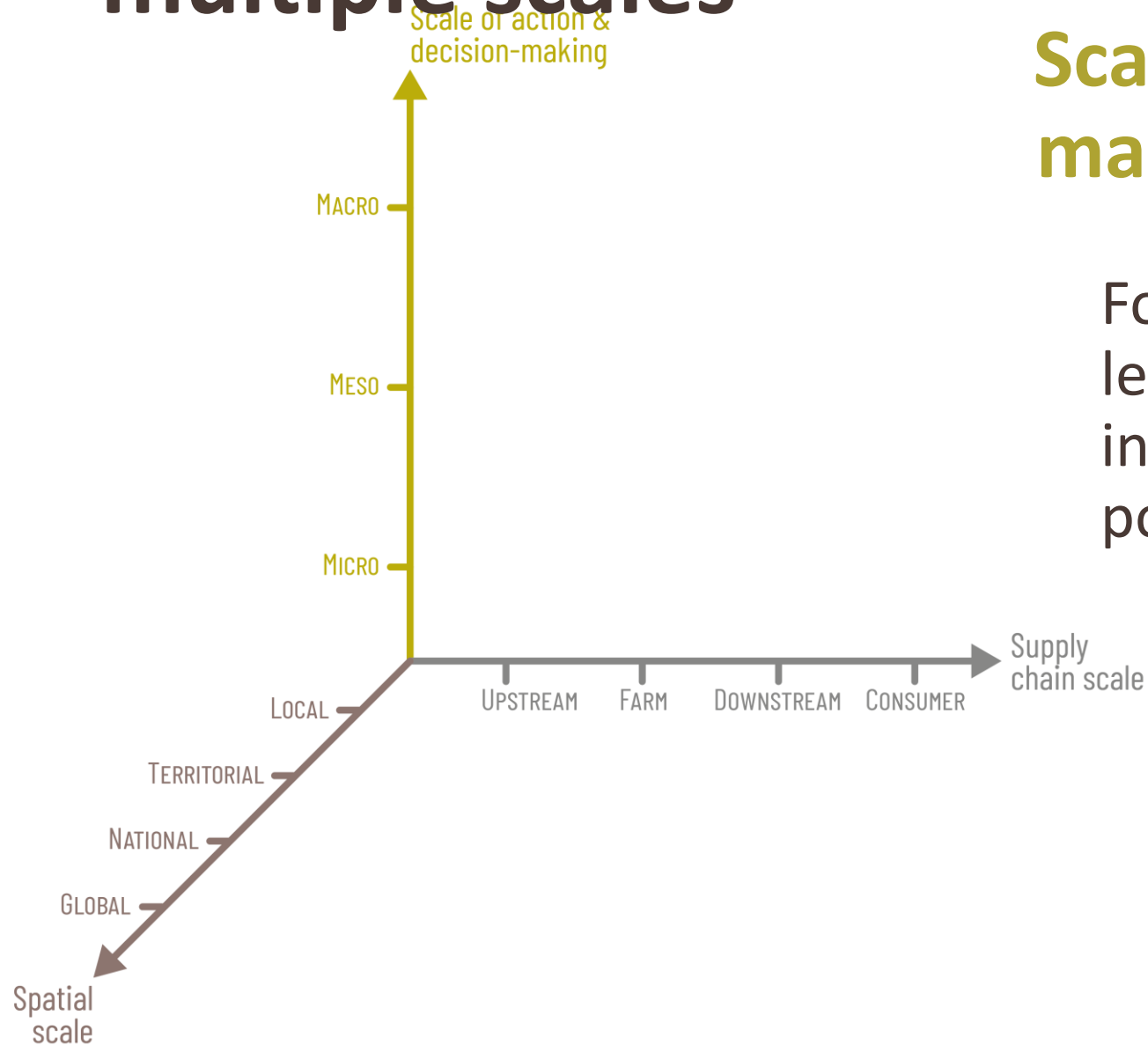
# Conceptualising food system transitions at multiple scales



## Supply chain scale

Food system transitions involve various supply chain actors and activities beyond the farm stage, from production to consumption.

# Conceptualising food system transitions at multiple scales



## Scale of action and decision making

Food system transitions imply various levels of action, ranging from individual actions and practices to policymaking.

# Diversity as an entry point to the meso level

## Macro

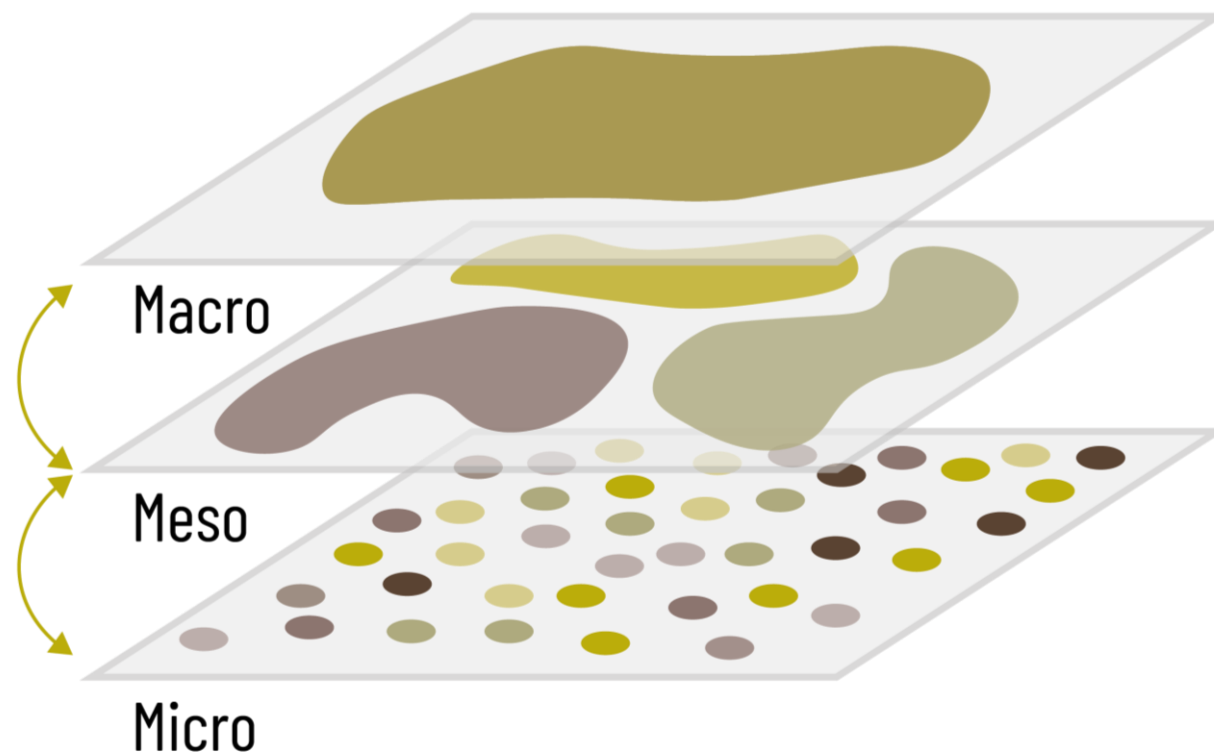
High aggregation - low diversity  
Useful for policymakers

## Meso




Intermediate diversity & aggregation  
Useful for both farmers & policymakers ?

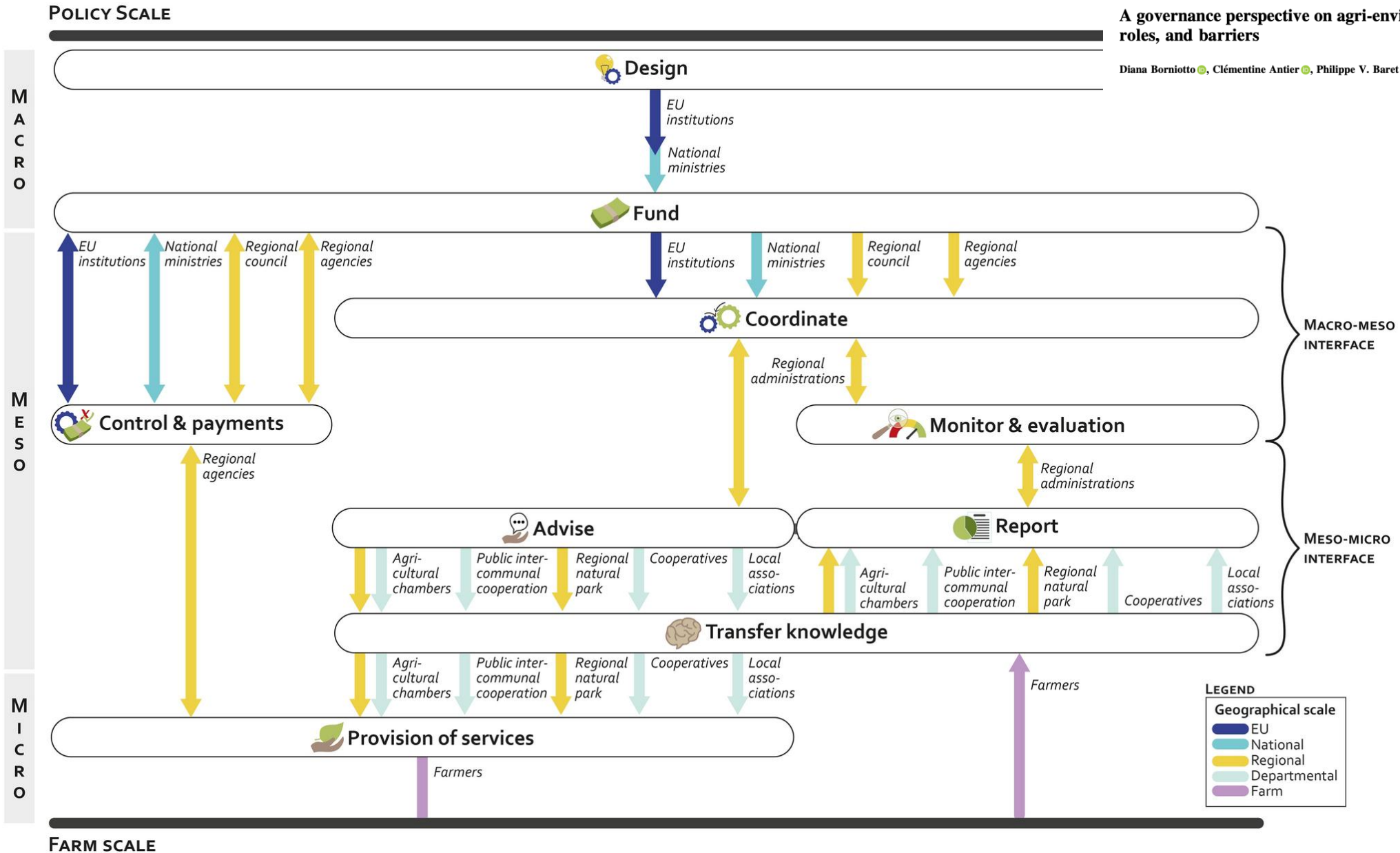
## Micro

High diversity - Low aggregation  
Useful for farmers



## A governance perspective on agri-environmental schemes: Actors, roles, and barriers

Diana Borniotto , Clémentine Antier , Philippe V. Baret 



# Diversity as an entry point to the meso level

## Macro

High aggregation - low diversity

Useful for **policymakers**

## Meso

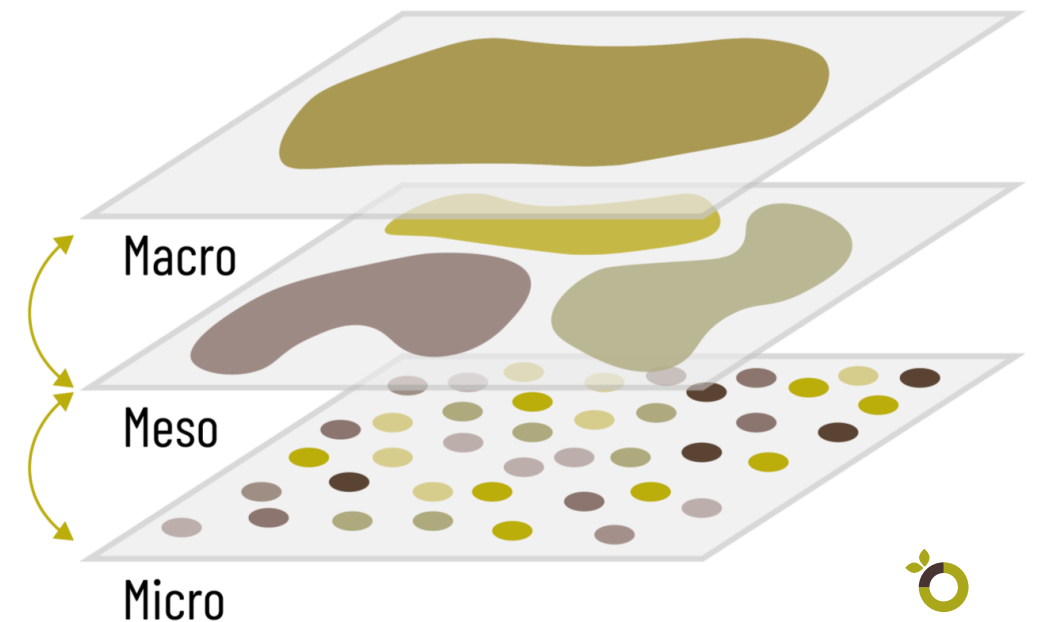
Intermediate diversity & aggregation

Useful for both **farmers & policymakers ?**

## Micro

High diversity - Low aggregation

Useful for **farmers**



# Agroecological transition is not a sum of agroecological practices

**Scaling up is not  
a change of level**

**New questions**

**New actors**

**New dimensions**







# The key role of modellers

# The key role of modellers

- **Why do we run models ?**
- **The long life of models**
- **Models and transition**



# Why do we run models

- **Because we like it**
- **Because we want to understand**
- **Because we want to explore the potential futures**
- **Because we want to have an impact**

# The long life of models

- **Good models have a long life**
- **Survival is a question of adaptation**
- **Ref(o)unding models**

# Models and transition

## Four status

**Models ignore transition**

**Models inform transition processes**

**Models support transition processes**

**Models guide transition processes**

# Models and transition

## Models ignore transition

scientific neutrality doesn't exist

scientific neutrality doesn't make sense

Research Policy 38 (2009) 971–983

Contents lists available at ScienceDirect

 **Research Policy** 

journal homepage: [www.elsevier.com/locate/respol](http://www.elsevier.com/locate/respol)

How agricultural research systems shape a technological regime that develops genetic engineering but locks out agroecological innovations

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### ABSTRACT

Agricultural science and technology (S&T) is under great scrutiny. Reorientation towards more holistic approaches, including agroecology, has recently been backed by a global international assessment of agriculture S&T for development (IAASTD). Understanding the past and current trends of agricultural S&T is crucial if such recommendations are to be implemented. This paper shows how the concepts of technological paradigms and trajectories can help analyse the agricultural S&T landscape and dynamics. Genetic engineering and agroecology can be usefully analysed as two different technological paradigms.

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Adèle Huguet 

# Models and transition

## Models inform transition process

prediction of future impacts -> advocacy  
data for supporting transition processes

« a parallel work »

# Models and transition

## Models support transition processes

models build from questions of transition  
process actors

**!!** should be ex-ante  
ex-post justification is mean ...

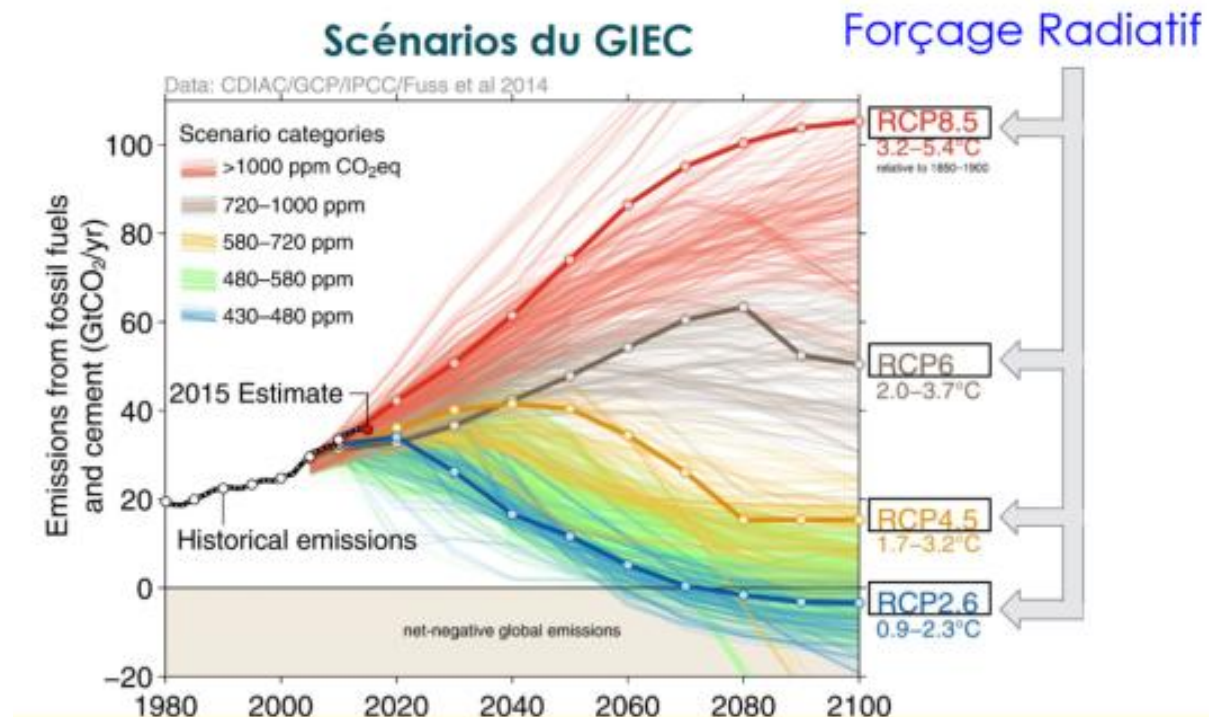
« a demand-based collaboration »

# Models and transition

Models guide transition processes  
models define transition processes

!! risk of overlooking lock-ins  
are modellers transition experts

« Modellers are leaders »



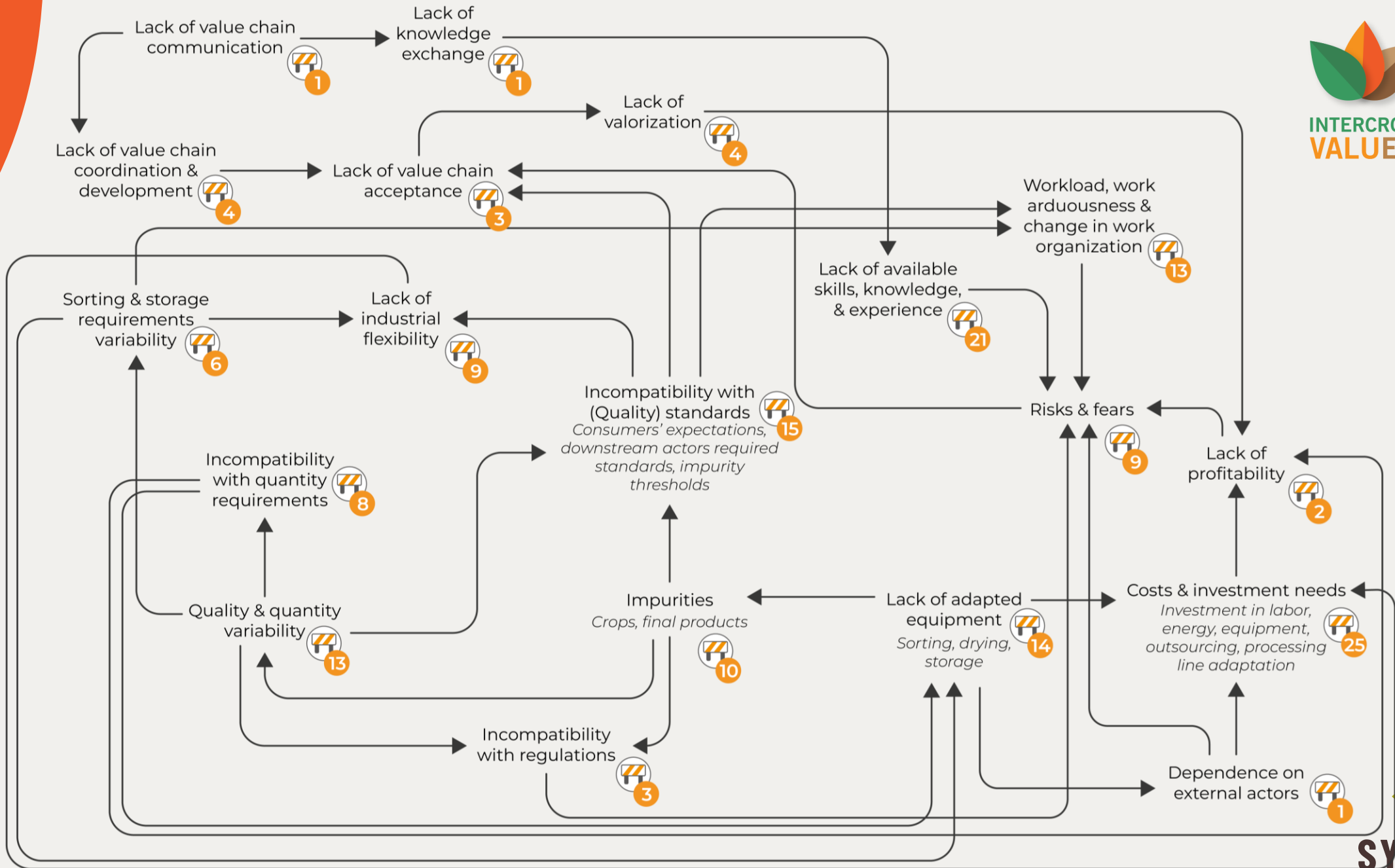
# Lock-in in complex systems

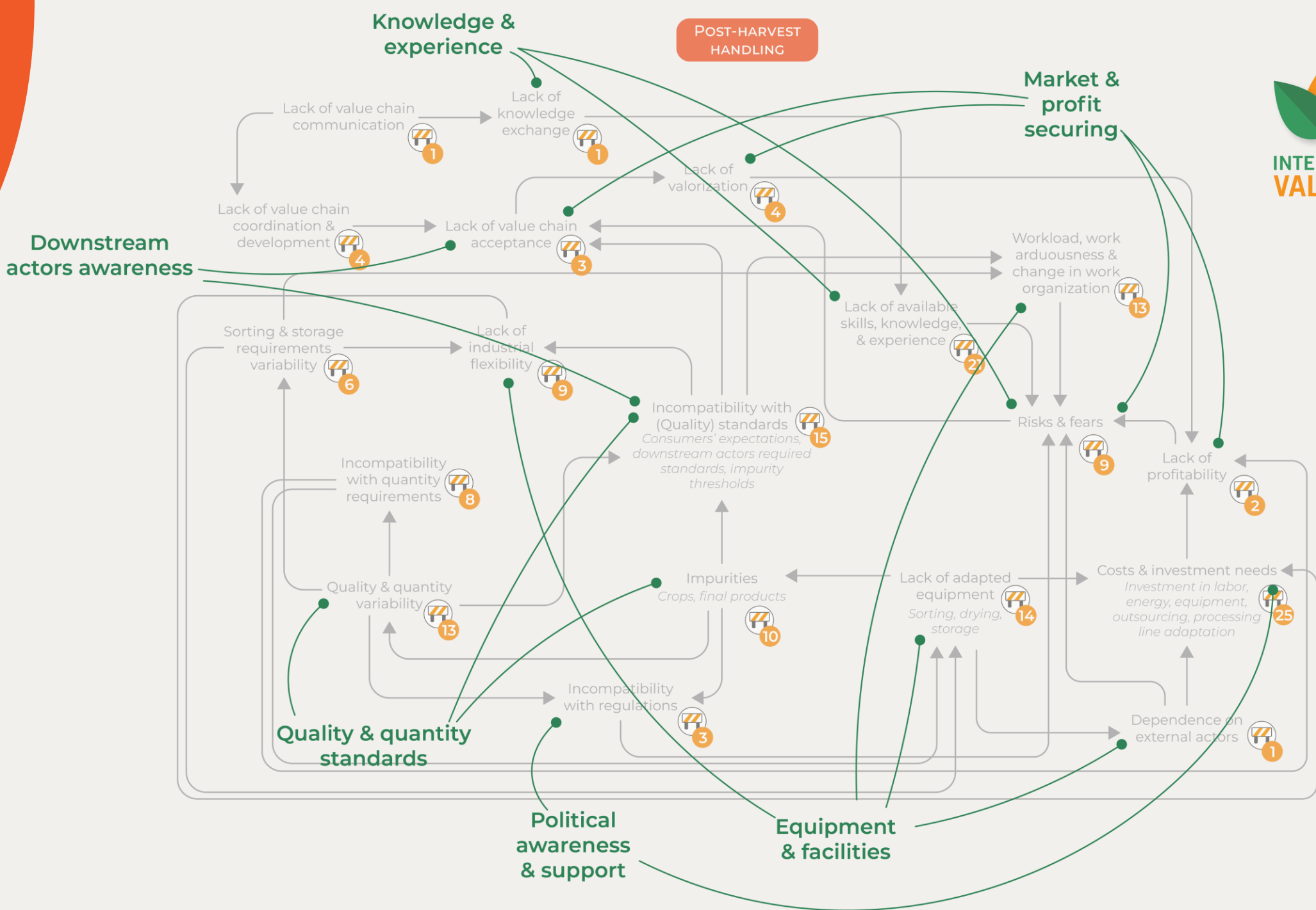
- **Transition is impeded by different elements**
  - Economic dimension
  - Lobbies
  - Habits ...
- **Lock-ins are in fact systemic**

# Mix sorting

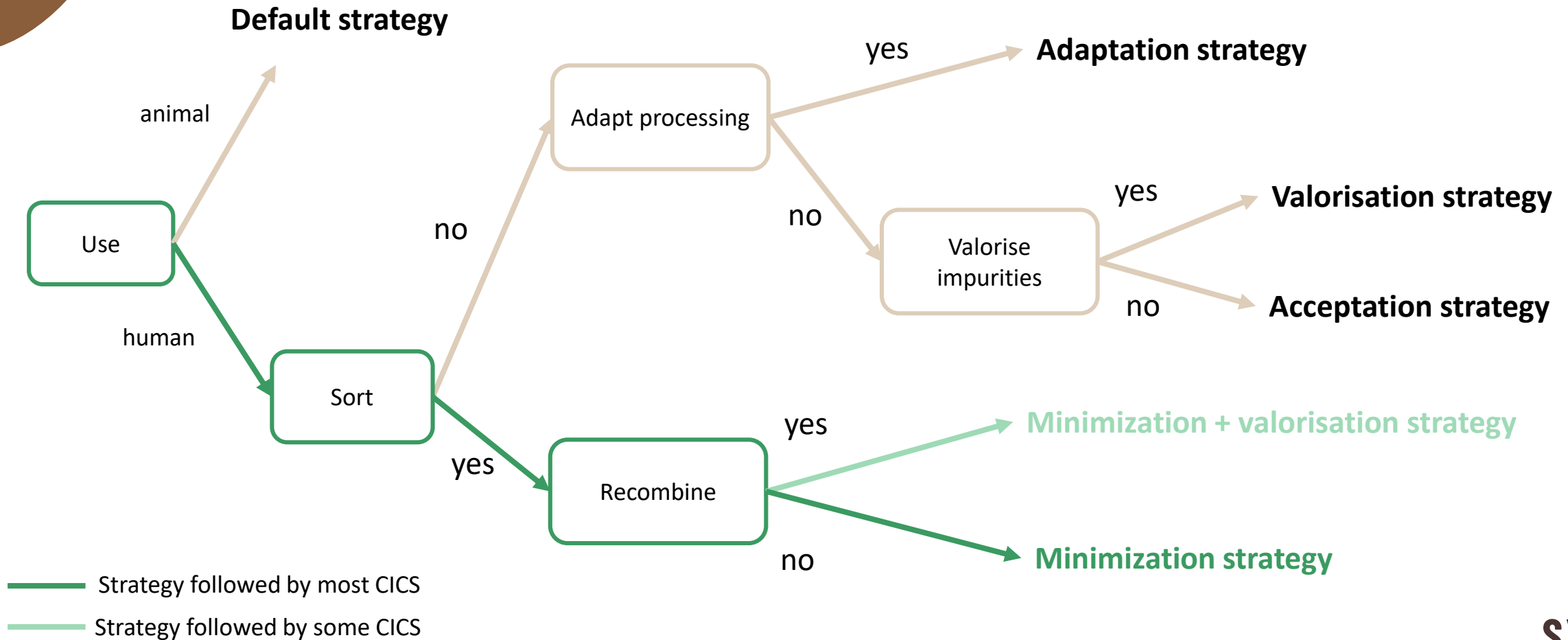


<https://csanr.wsu.edu/cover-crop-monoculture-not-mixture/>





## Market securing: CICS mostly investigate a minimization strategy



## Most interestingly, the identification of solutions led to the identification of strategies

Strategies = groups of solutions targeting subparts of the priority issues.



*Example: strategies identified to cope with impurities in intercropping*



### **Minimization strategy**

*Eliminate/minimize the presence of impurities in sorted crops coming from intercropping, allowing for a «business as usual» operation of value chains.*



### **Acceptation strategy**

*Accept impurities quantities as long as there is no impact on processing processes and product quality*



### **Adaptation strategy**

*Adapt processing processes to the presence of impurities, without changing the final product*



### **Valorization strategy**

*Turn impurities into an advantage to develop new (premium) products or increase the nutritional quality of existing products*

# Complex interactions

- **Social science scientists are difficult to understand ...**
- **.... STICS modellers are well**
  
- **Difficult to listen to questions when we have the answers**
  
- **Interdisciplinarity is a long term process**

# Conclusions

- **Support a vision**
- **Transition is a process**
- **Identify question**
- **Collaboration implies a frame**
- **Scaling up is not the talent of models**

# Conclusions

- **S**upport a vision
- **T**ransition is a process
- **I**dentify question
- **C**ollaboration implies a frame
- **S**caling up is not the talent of models




**SYTRA**

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transition of  
food systems

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