Agricultural systems
by design

8th International Farming System Design Conference
Palaiseau – 25-29 August 2025

AgroParisTech

INRAE

ideas
INITIATIVE FOR DESIGN
IN AGRIFOOD SYSTEMS

Agricultural systems by design

Key-Note

Accelerating the transition
A multi-scale approach

Philippe V. Baret

UCLouvain-Sytra, Belgium

with Diana Borniotto, Océane Duluins, Anton Riera, Noé Vandevoorde

Agricultural systems by design

Key-Note

Acce ion
A r h

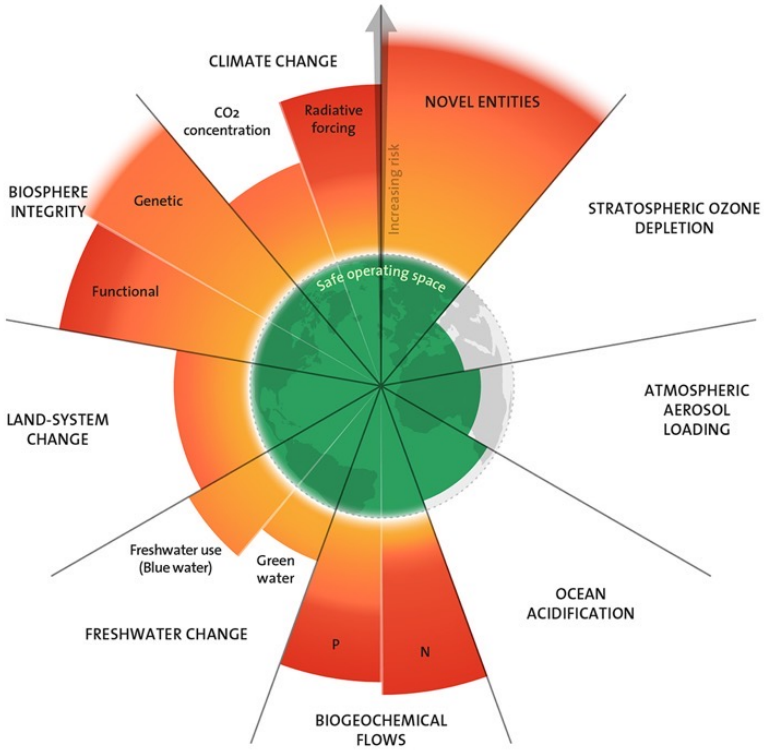
with Diana B devoorde


Agroecology on the move

The rhythms of food systems

Pieter Bruegel
The Harvesters, 1565

The tango of urgency and status quo



The rhythms of food systems

- Structural constraints
  - It takes a generation to redesign a farm
  - The seven year cycle of Common Agricultural Policy
  - 40 years to get rid of most of the neonicotinoids in EU

- An ambiguous socio-technical landscape

  If we consider the challenges, we are too slow

  If we consider acceptability by most of the society, we are too quick

The rhythms of food systems

- An ambiguous socio-technical landscape
  - If we consider the challenges, we are too slow
  - If we consider acceptability by most of the society, we are too quick

- But ..
  - Farm2Fork was killed in two weeks
  - French agriculture was back to 2011 in several months
  - World trade paradigm is upside down in six months

First challenge
Balancing impact and consensus

Francisco Goya
The Seesaw, 1791

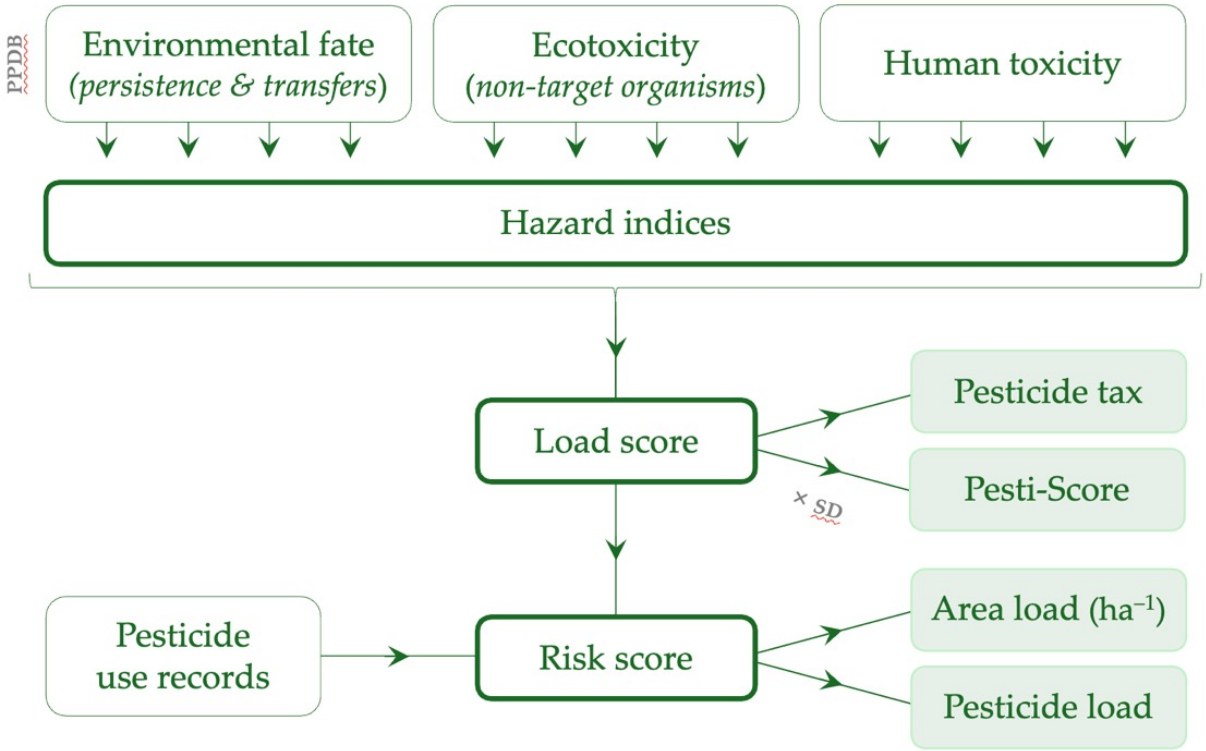
Monitoring impact

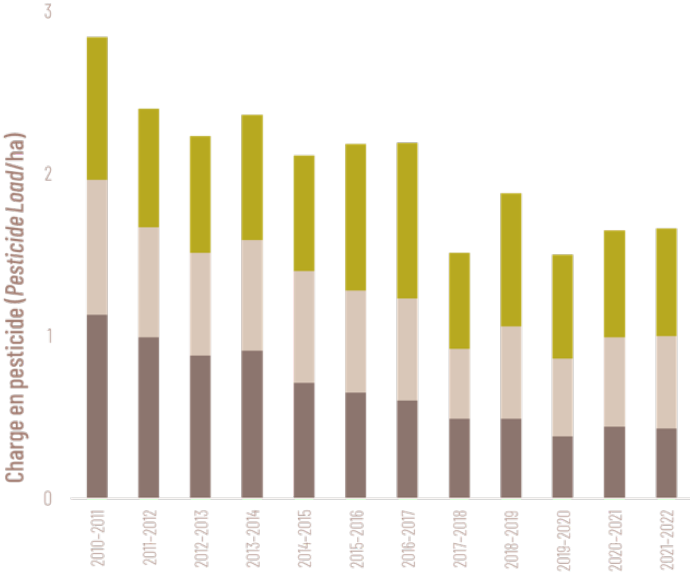
Transition is highly dependent on indicators

A first step to **impede transition** is **no indicator** or irrelevant indicator

The pesticide reduction policy is a good illustration of this challenge

The Pesticide load index





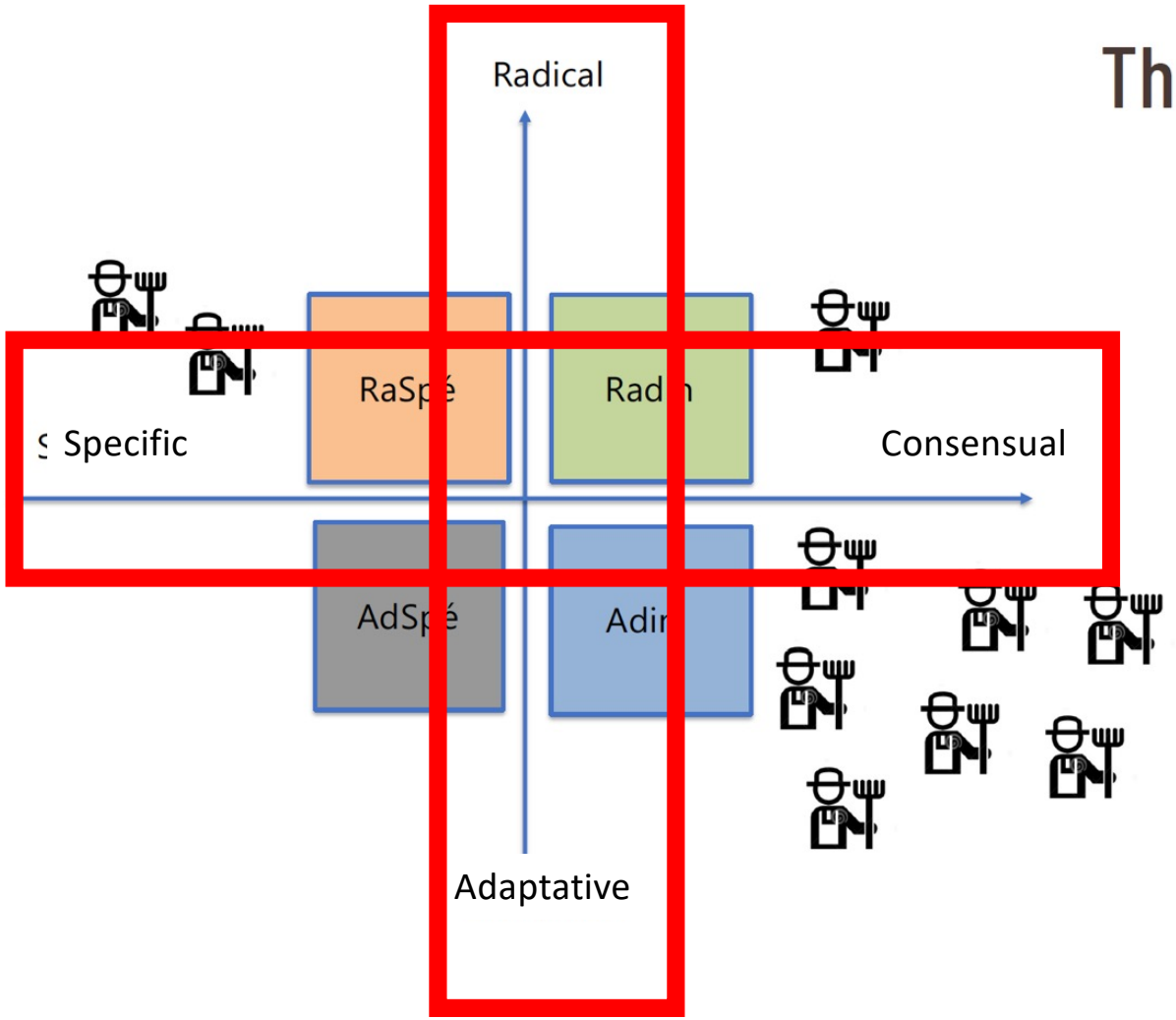
2013-2023 : - 40 %

Source : Noé Vandevoorde, Sytra

Scientists should support the relevant indicators to interface science and policy

Balancing impact and consensus

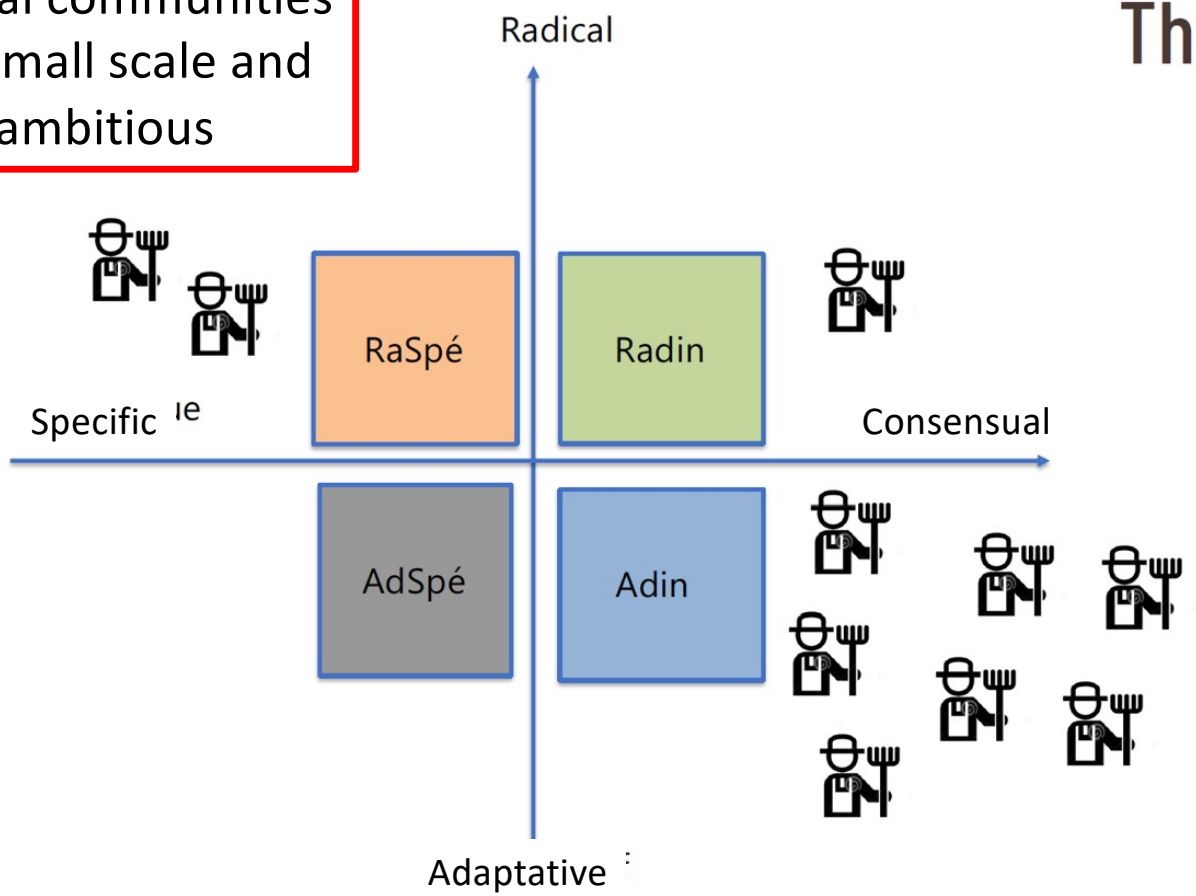
The Radin model



Source : Baret and Antier, 2023

Radical communities are small scale and ambitious

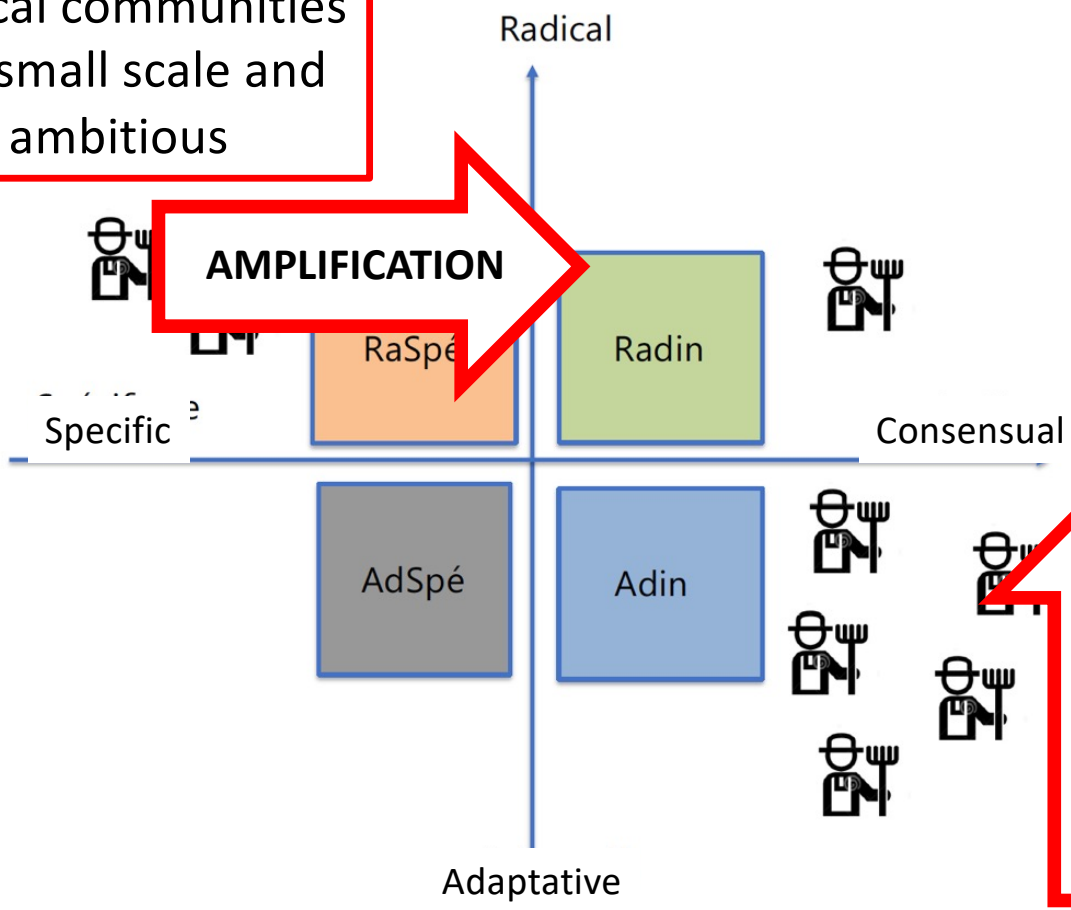
The Radin model



Mainstream actors are implementing very incremental approach

The Radin model

Radical communities are small scale and ambitious



AMBITION

Mainstream actors are implementing very incremental approach

Innovation should be embedded in a global theory of change

Second challenge
Interfacing micro and meso level

Agri-environmental measure is a key component of green architecture

CAP Specific objectives

↓

Conditionality (SMRs and GAEC)

↓

Eco-schemes
- field, farm, landscape levels
- single or multi-objective

↓

Pillar 2 AECMS
- tailored measures and longer-term investments to address specific needs

Spatial scale

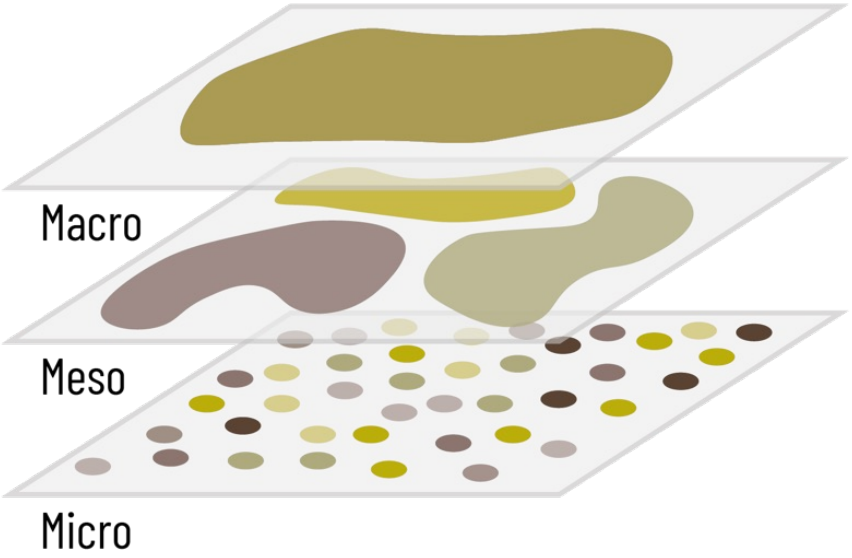
Decision level

Scale of action and decision-making

Policy level
e.g., policy makers

Intermediate level
e.g., farm counsellors, farmer unions, sectoral organizations,...

Individual level
e.g., farmers, consumers, processors, retailers,...



Level of diversity and aggregation

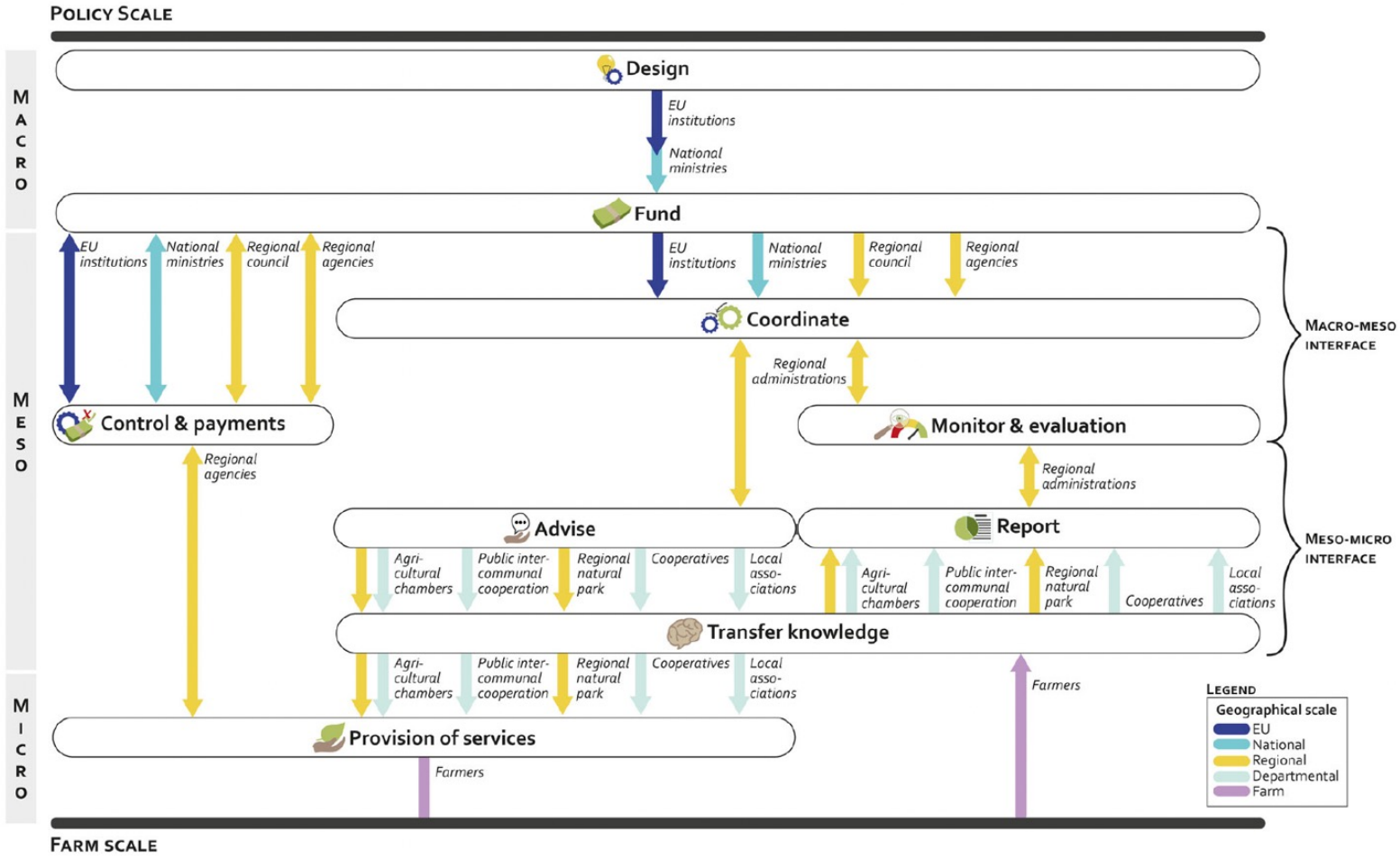
Low diversity & high aggregation
e.g., all farmers

Intermediate diversity & intermediate aggregation
e.g., conventional farmers, organic farmers,...

High diversity & low aggregation
e.g., consideration of individual farmers' practices

Source : Anton Riera, Sytra

AECM gouvernance is multiscale



ive on agri-environmental schemes: Actors,

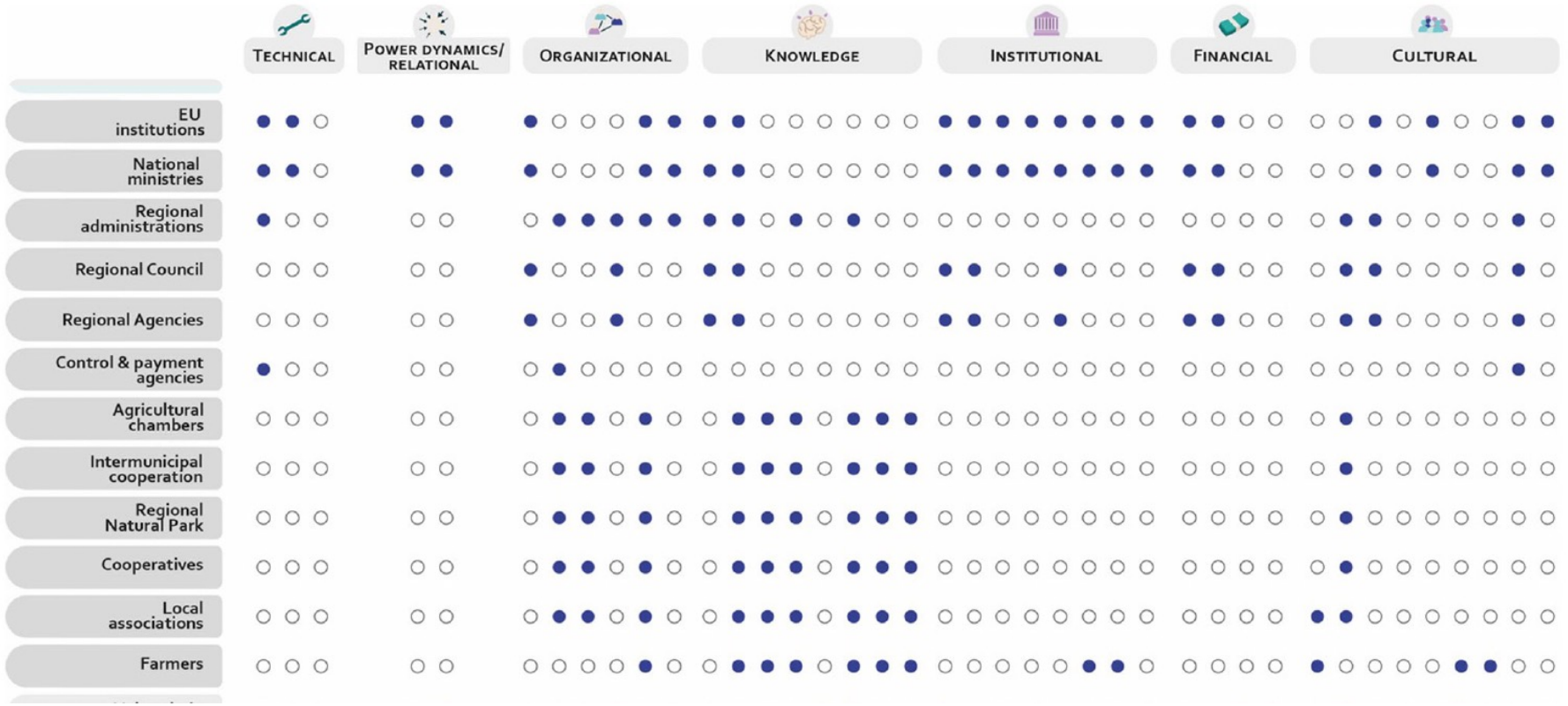
er Philippe V. Baret

bruary 2025 / Accepted: 26 March 2025

Agricultural systems by design

Barriers to the AECM implementation are numerous

Ambio



Received: 4 November 2024 / Revised: 17 February 2025 / Accepted: 26 March 2025
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Barriers to the AECM are mainly at macro/meso level

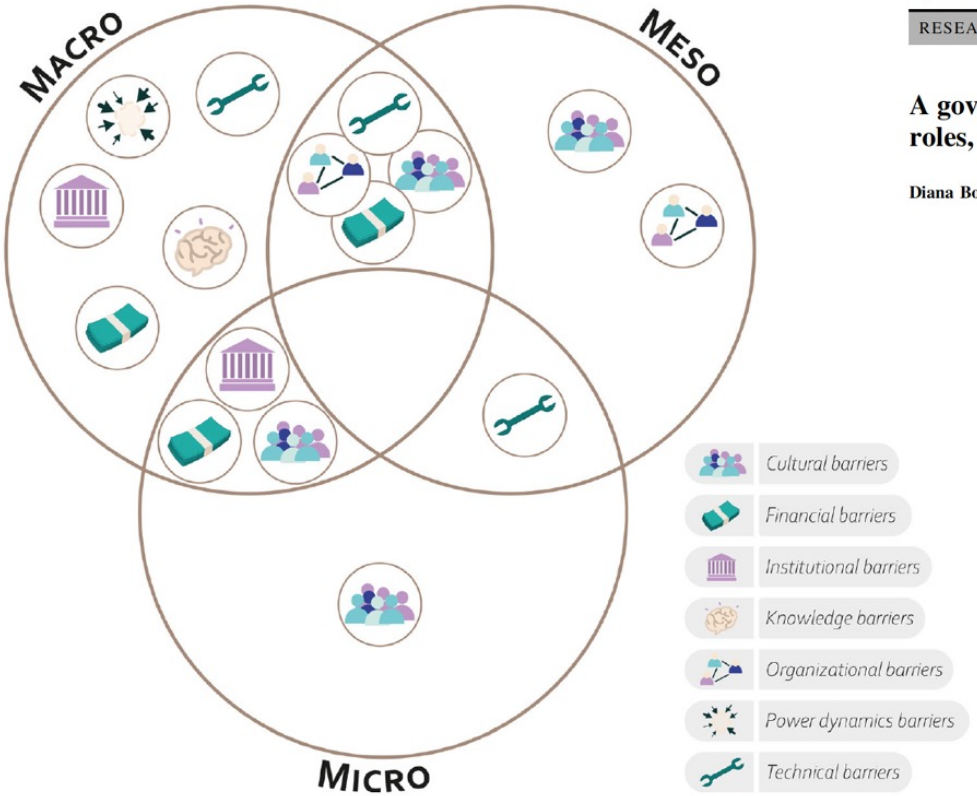


Fig. 6 Barriers from a multilevel governance perspective, categories of barriers present per governance level in Hauts-de-France

Ambio
https://doi.org/10.1007/s13280-025-02182-0
KUNGL. VETENSKAPS-AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES
Check for updates
RESEARCH ARTICLE

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

Diana Borniotto, Clémentine Antier, Philippe V. Baret

Source : Borniotto et al., 2025

Taking into account the upper levels

- Most of the studies on adoption of practices are focus on farmers
- Most of the policies failures are assigned to lack of farmer's commitment

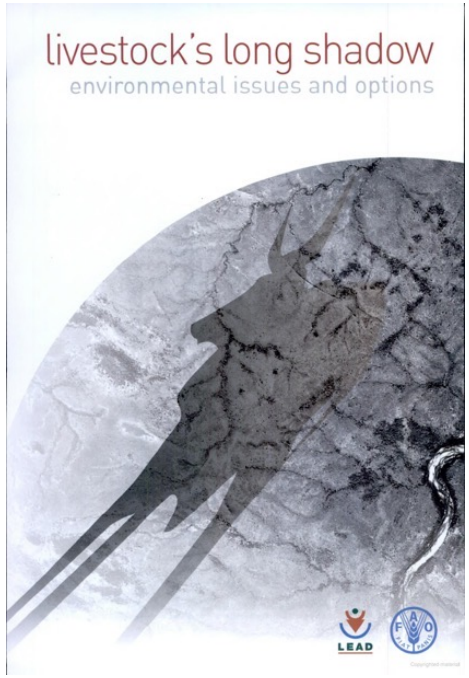
- More attention to the interfaces are required
  - In terms of actors
  - In terms of topics
  - In terms of processes

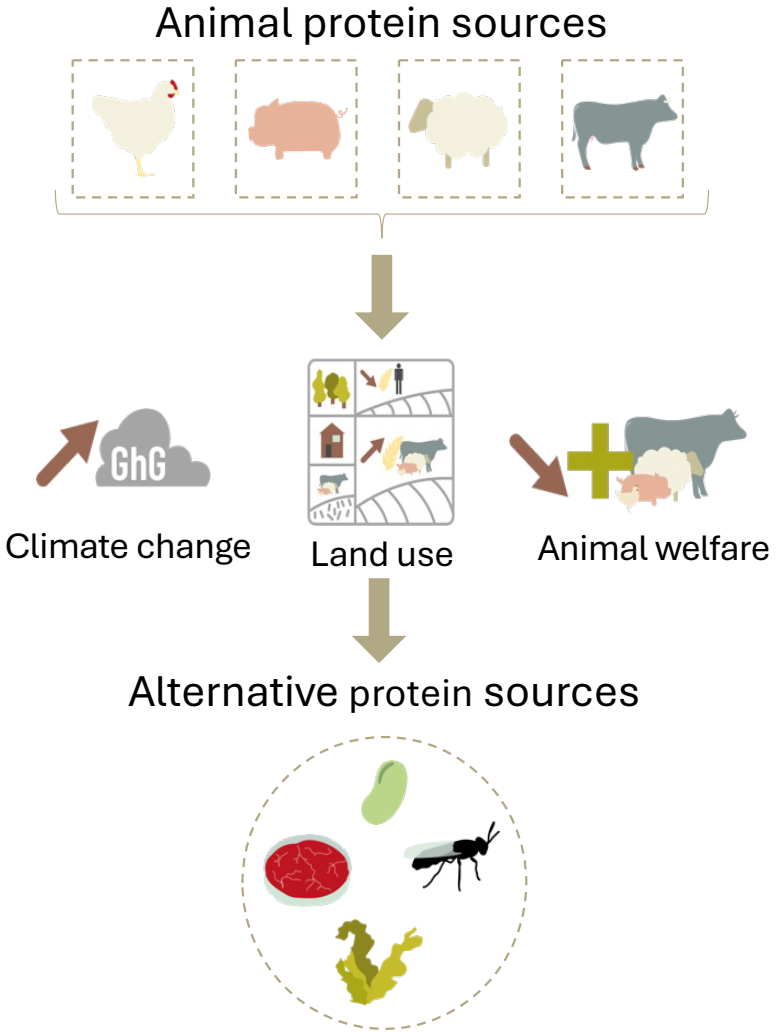
Most of the barriers are out of reach for farmers


PROTEINE
SMAAKT ALL
GOOD!
NIEUW!
WHEN LIFE GIVES YOU Cécémel

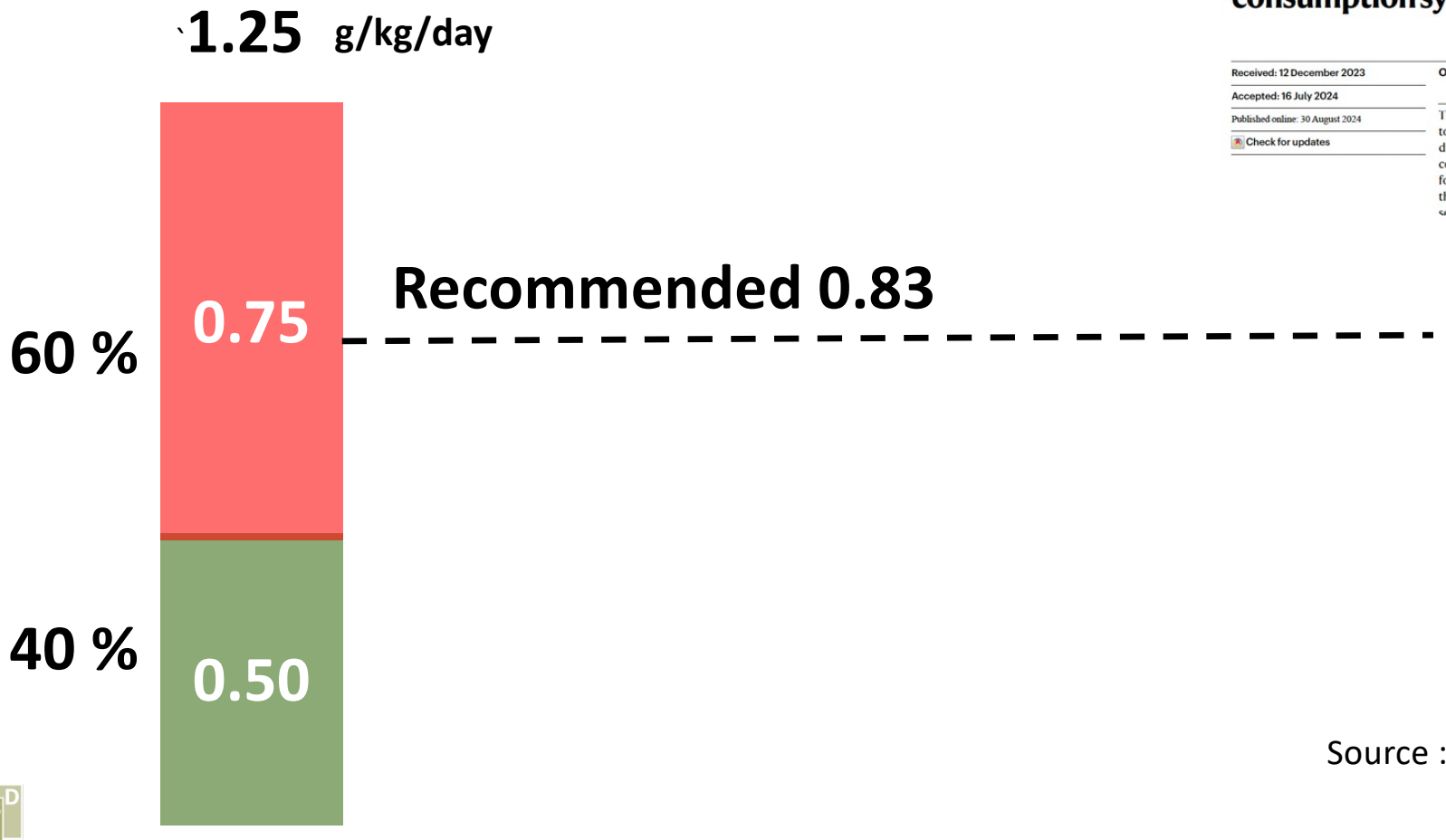
Protein transition

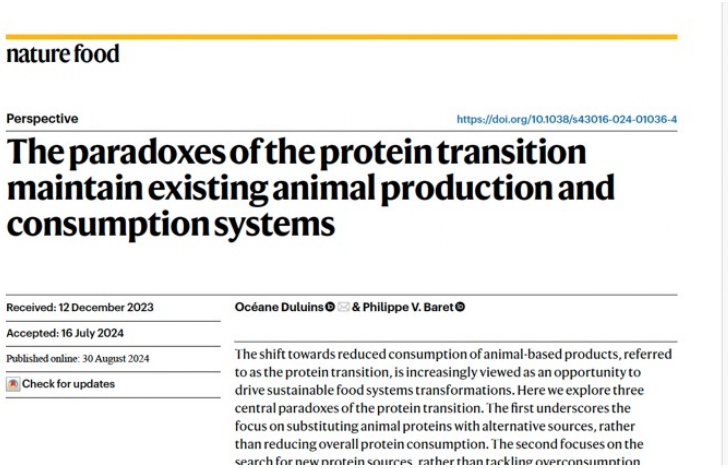
The objective of protein transition is to diminish impacts of livestock





We overconsume proteins





nature food

Perspective https://doi.org/10.1038/s43016-024-01036-4

The paradoxes of the protein transition maintain existing animal production and consumption systems

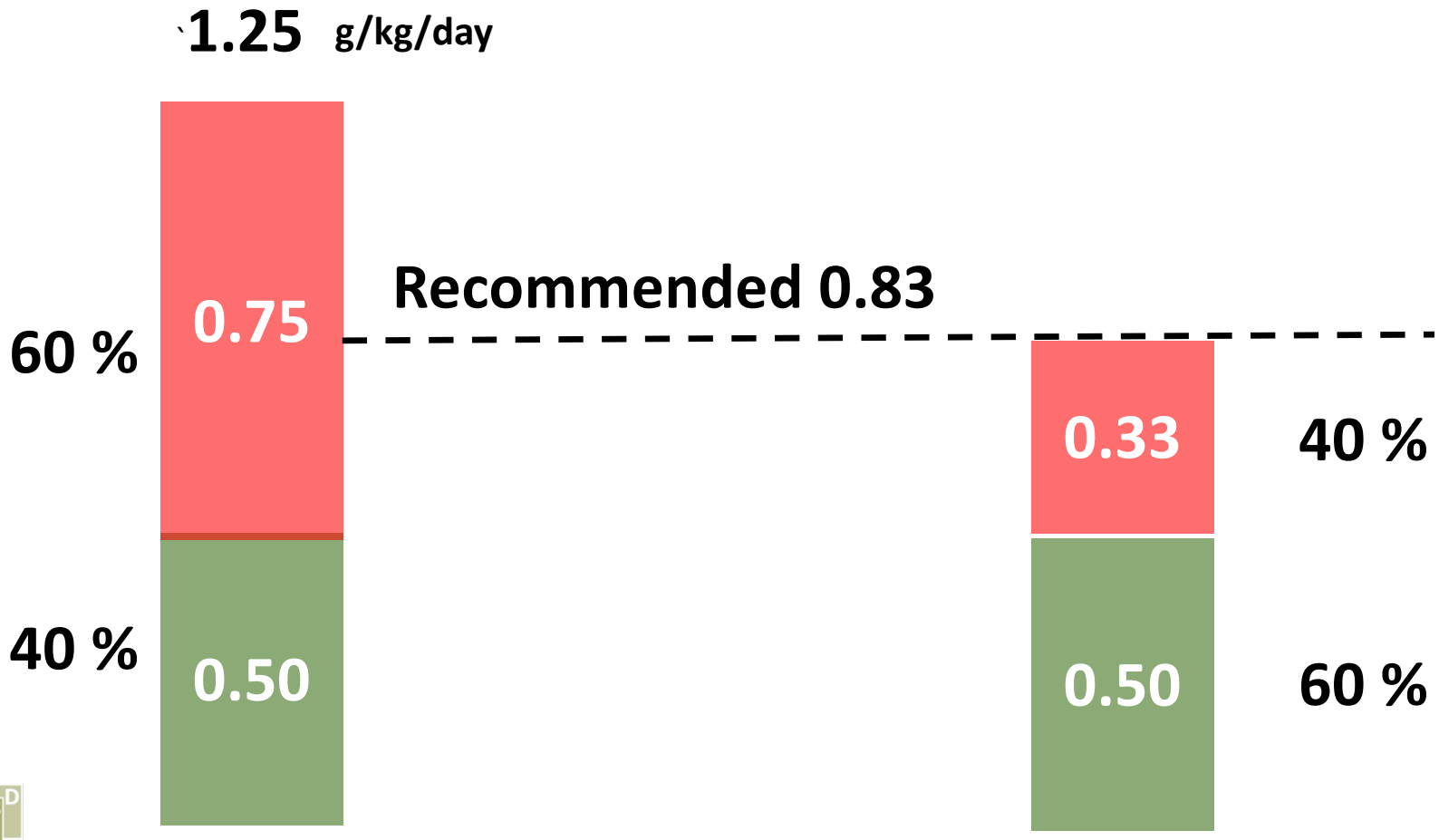
Received: 12 December 2023
Accepted: 16 July 2024
Published online: 30 August 2024
Check for updates

Océane Duluins & Philippe V. Baret

The shift towards reduced consumption of animal-based products, referred to as the protein transition, is increasingly viewed as an opportunity to drive sustainable food systems transformations. Here we explore three central paradoxes of the protein transition. The first underscores the focus on substituting animal proteins with alternative sources, rather than reducing overall protein consumption. The second focuses on the search for new protein sources, rather than tackling overconsumption

Source : Duluins and Baret, 2024

We overconsume proteins



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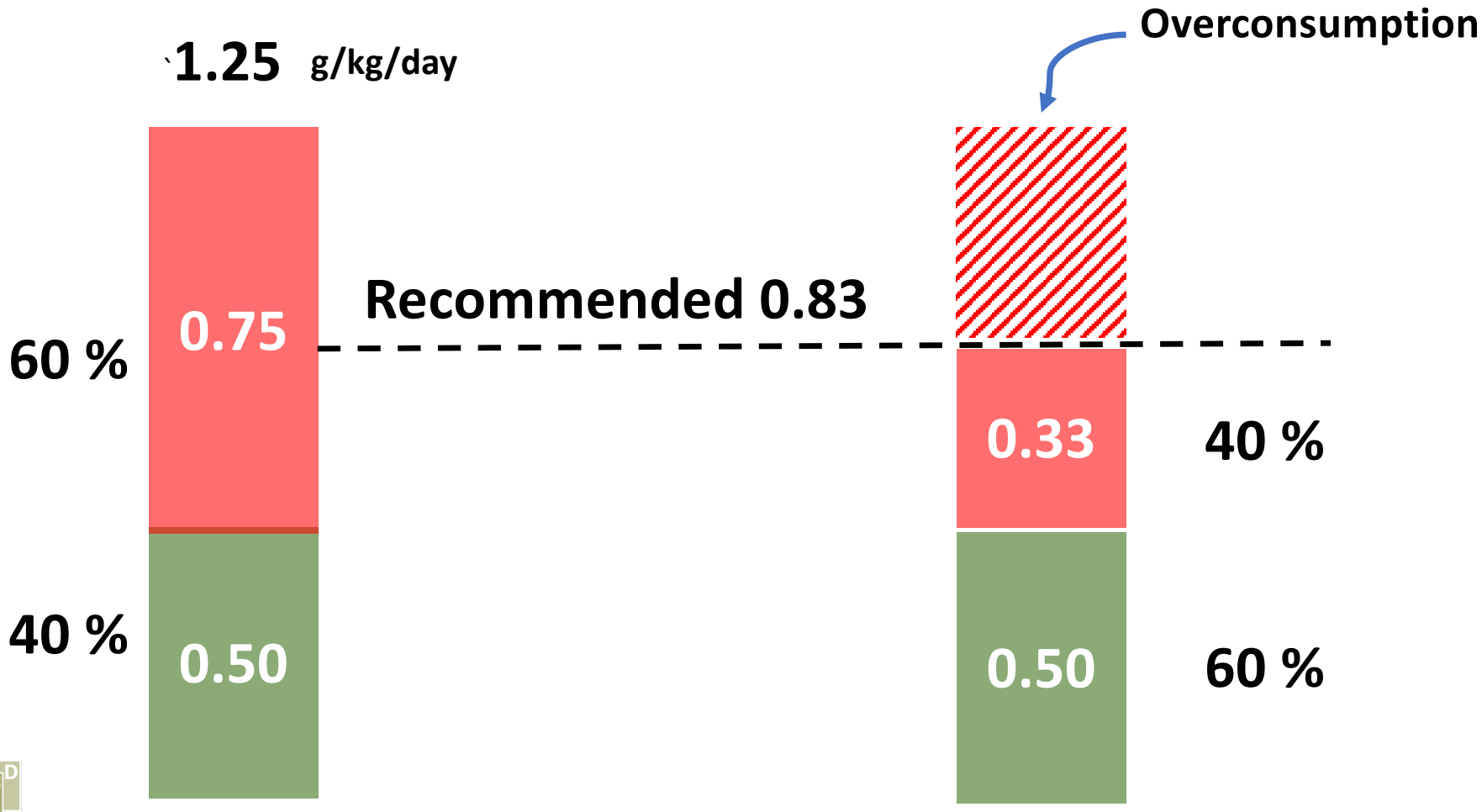
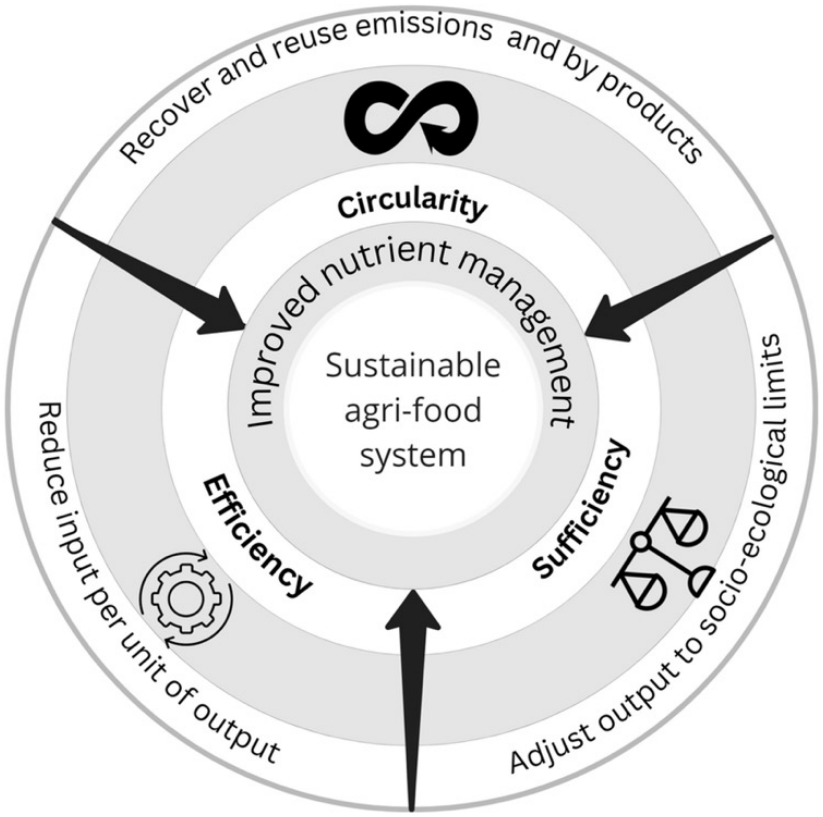


From more with less to less is more

A paradigm shift



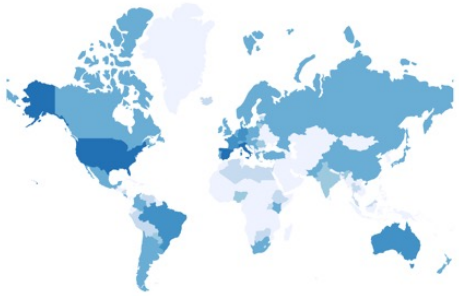
Source : Spiller et al., 2024

Source : World Sufficiency Lab


Pour
1€
en plus*
Coca-Cola
zero
SUGAR
*Avec ton McMenu® Large
Valable dans tous les restaurants participants de McDonald's Belgique. Offre valable du 26/08 au 22/09 ou jusqu'à épuisement des stocks.

The Dublin declaration

An advocacy for livestock systems



Livestock systems must progress on the basis of the highest scientific standards.

They are too precious to society to become the victim of simplification, reductionism or zealotry.

These systems must continue to be embedded in and have broad approval of society.

For that, scientists are asked to provide reliable evidence of their nutrition and health benefits, environmental sustainability, socio-cultural and economic values, as well as for solutions for the many improvements that are needed.

This declaration aims to give voice to the many scientists around the world who research diligently, honestly and successfully in the various disciplines in order to achieve a balanced view of the future of animal agriculture.

Scientists vs. scientists

Comment

https://doi.org/10.1038/s43016-024-01054-2

The Dublin Declaration fails to recognize the need to reduce industrial animal agriculture

Chris Bryant, Harry Aiking, Roberta Alessandrini, Paul Behrens, Felix Creutzig, Gidon Eshel, Rosemary Green, Nicholas Hutchings, Adrian Leip, Ron Milo, Pete Smith & Hannah van Zanten

Check for updates

The framework presented in the Dublin Declaration has generated controversy by advocating for maintaining or increasing livestock numbers. The serious and acute harms associated with global livestock production today bring the goals of the declaration into dispute.

animal products are essential to
is true that animal-sourced food
dietary needs vary across the hun
are not always necessary for good
ents can be obtained from plants,
with a lower environmental impa
health drawbacks of animal prod
The argument that increase
nutrition in low-income countri
access to animal products in th
production. However, the world a

The Dublin Declaration: Gain for the Meat Industry, Loss for Science

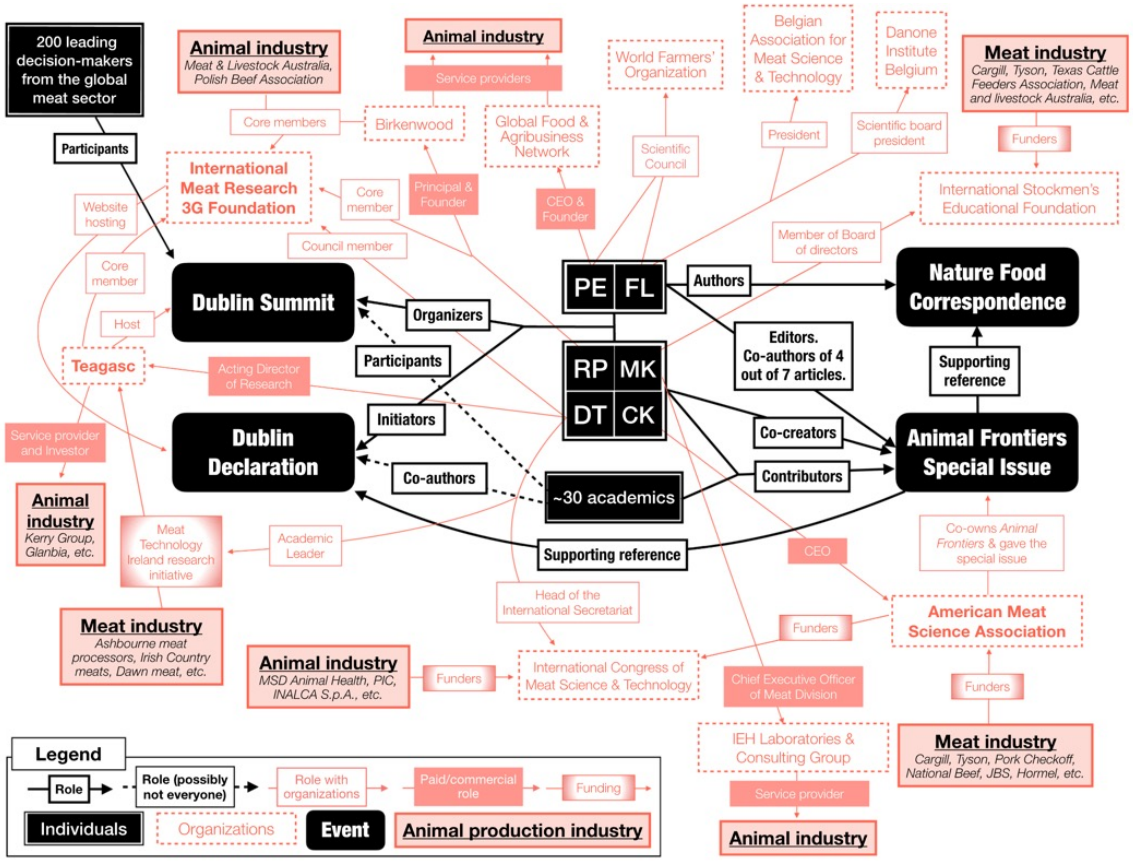
Jochen Krattenmacher [a,b,1], Romain Espinosa [c,*,1], Edel Sanders [d], Richard Twine [e], William J. Ripple [f]

[a] *Faculty of Science, Charles University in Prague, 12800 Prague, Czech Republic*
[b] *Global Climate Forum, Neue Promenade 6, Berlin 10178 Germany*
[c] *CNRS, CIRED, Nogent-sur-Marne, France*
[d] *School of Psychology, University of New York in Prague, Czech Republic*
[e] *Centre for Human-Animal Studies (CfHAS), Edge Hill University, UK*
[f] *Department of Forest Ecosystems and Society, Oregon State University, Corvallis, OR, USA*

ARTICLE INFO

ABSTRACT

The DD declaration is unscientific despite the support of many scientists



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ARTICLE INFO ABSTRACT

Overlooking the interface ?

Knowledge issue

Most of the micro-level specialists (plot and farm levels) lack of knowledge about the meso level dynamics

Justification issue

Justification of some local and specific research is assigned to loosely characterized global issues

Lobbies issue

Use by lobbies of specific nice results to justify irrelevant (ugly) policies

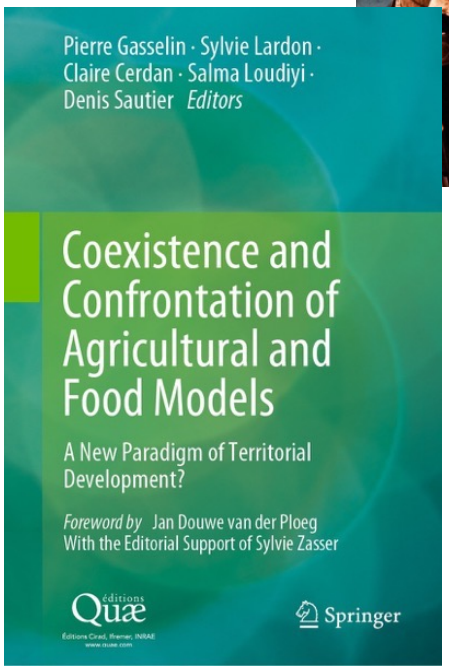
Sincere scientists may be hacked by vested interests

A way forward ?

An issue of coexistence

The future of agri-food systems is not a battle between the good, the bad and the ugly

Agri-food systems are made of coexisting models



The future of food systems implies

- deciding the share of each model
- organising the coexistence

Spatial scale

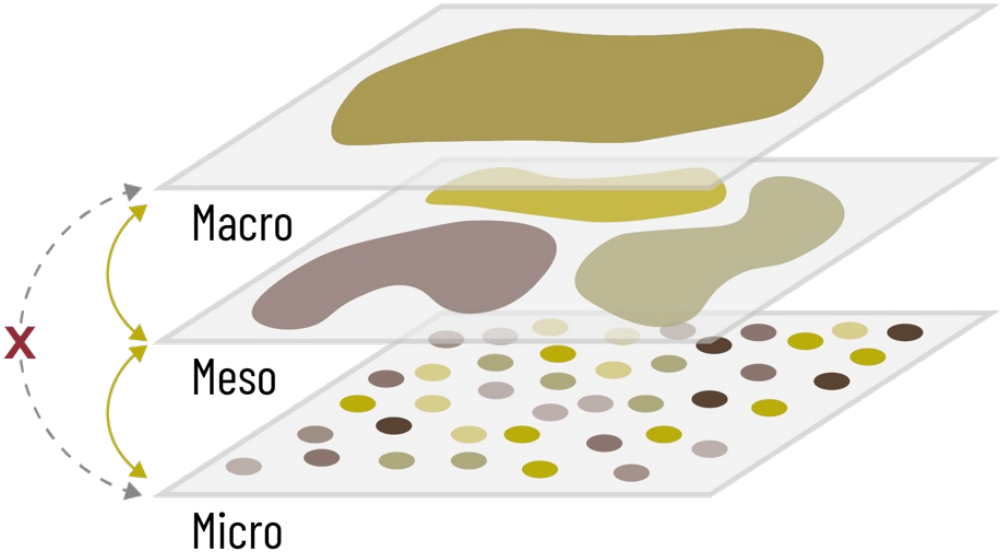
Decision level

Scale of action and decision-making

Policy level
e.g., policy makers

Intermediate level
e.g., farm counsellors, farmer unions, sectoral organizations,...

Individual level
e.g., farmers, consumers, processors, retailers,...



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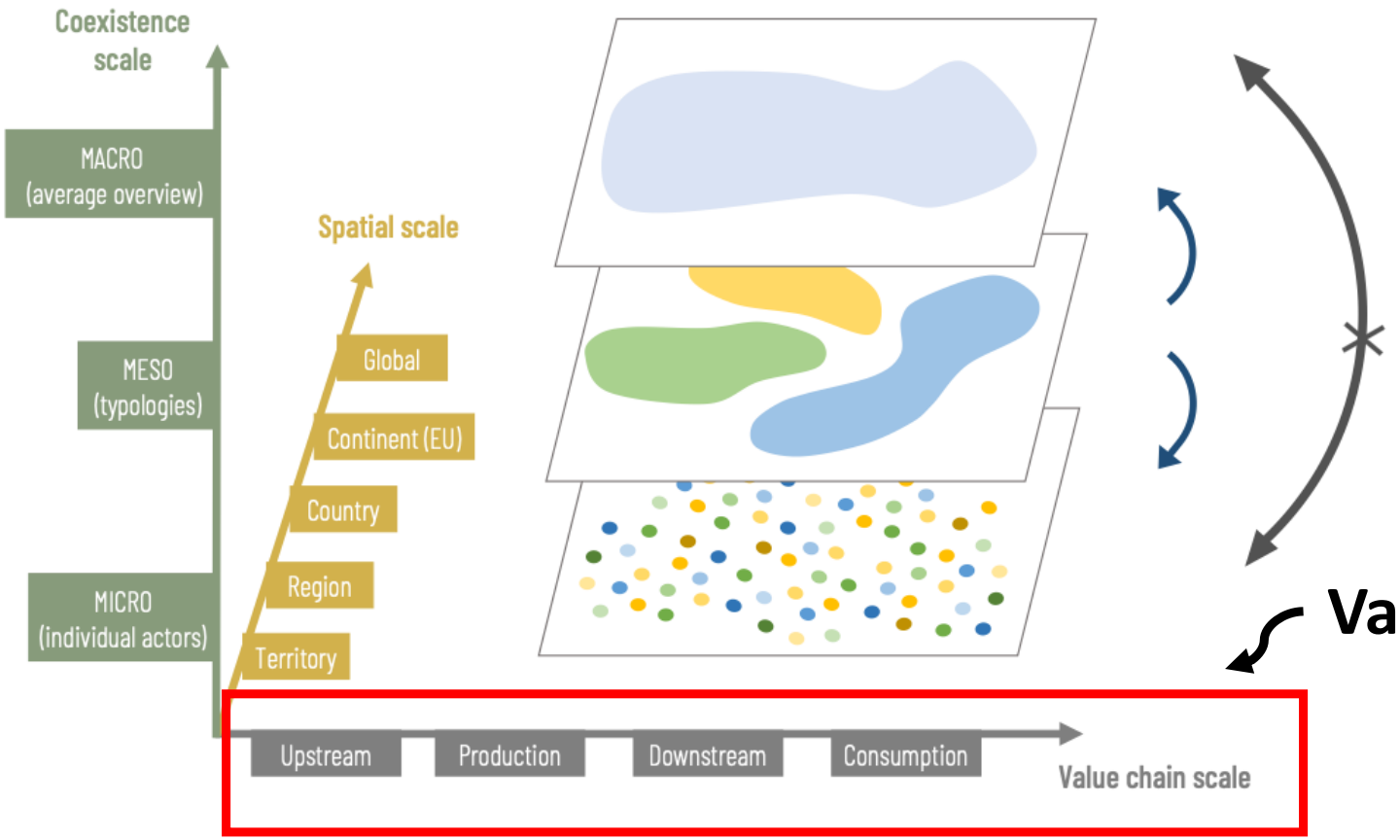
Source : Anton Riera, Sytra



Value chain steps

Figure 2. Analytical scales to research food systems and the meso-level perspective.

Source : Riera, Sytra

All scientists are policy makers

Science is never neutral

- Contribution to specific models
- Competition for ressources

How to understand impacts and contribute to transition ?

- Question the research question
- Work together
- Be part of the societal debate

A learning process

Environ. Res. Lett. **20** (2025) 084042 https://doi.org/10.1088/1748-9326/ade86f

ENVIRONMENTAL RESEARCH
LETTERS

LETTER

A restatement of the protein transition

O Duluins[1,9,*], R Cardinaals[2,9], H Potter Karlsson[3], S Nájera Espinosa[4], K Resare Sahlin[5], J J L Candel[6], S Hornborg[7], A Matthews[8] and P V Baret[1]

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[4] Department of Population Health, London School of Hygiene & Tropical Medicine, London, United Kingdom
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Keywords: protein transition, narratives, sustainability, animal production, dietary changes, food systems transformation, interdisciplinarity

e Supplementary material for this article is available online

9 authors
176 pages
68 statements
552 references

A disaster is not the sudden occurrence of the unexpected, but rather the continuation of the worst possible scenario when no one can find a way to prevent it.

Patrick Boucheron, Le temps qui reste

Pieter Bruegel
The fall of rebel angels, 1562

4
6




SYTRA

transition of food systems

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Sytra - UCLouvain

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