



## Specific characteristics of innovative design in agriculture

Marianne Cerf, Lorène Prost, Elsa Berthet, Marie-Helene Jeuffroy, Julie Labatut, Jean-Marc Meynard

### ► To cite this version:

Marianne Cerf, Lorène Prost, Elsa Berthet, Marie-Helene Jeuffroy, Julie Labatut, et al.. Specific characteristics of innovative design in agriculture: How may design in agriculture challenge design theory. 6th SIG Design Theory Workshop- Design Society, SCS-AGR., Feb 2013, NA, France. hal-01186887

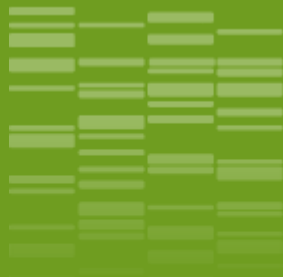
**HAL Id: hal-01186887**

**<https://hal.science/hal-01186887>**

Submitted on 6 Jun 2020

**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.



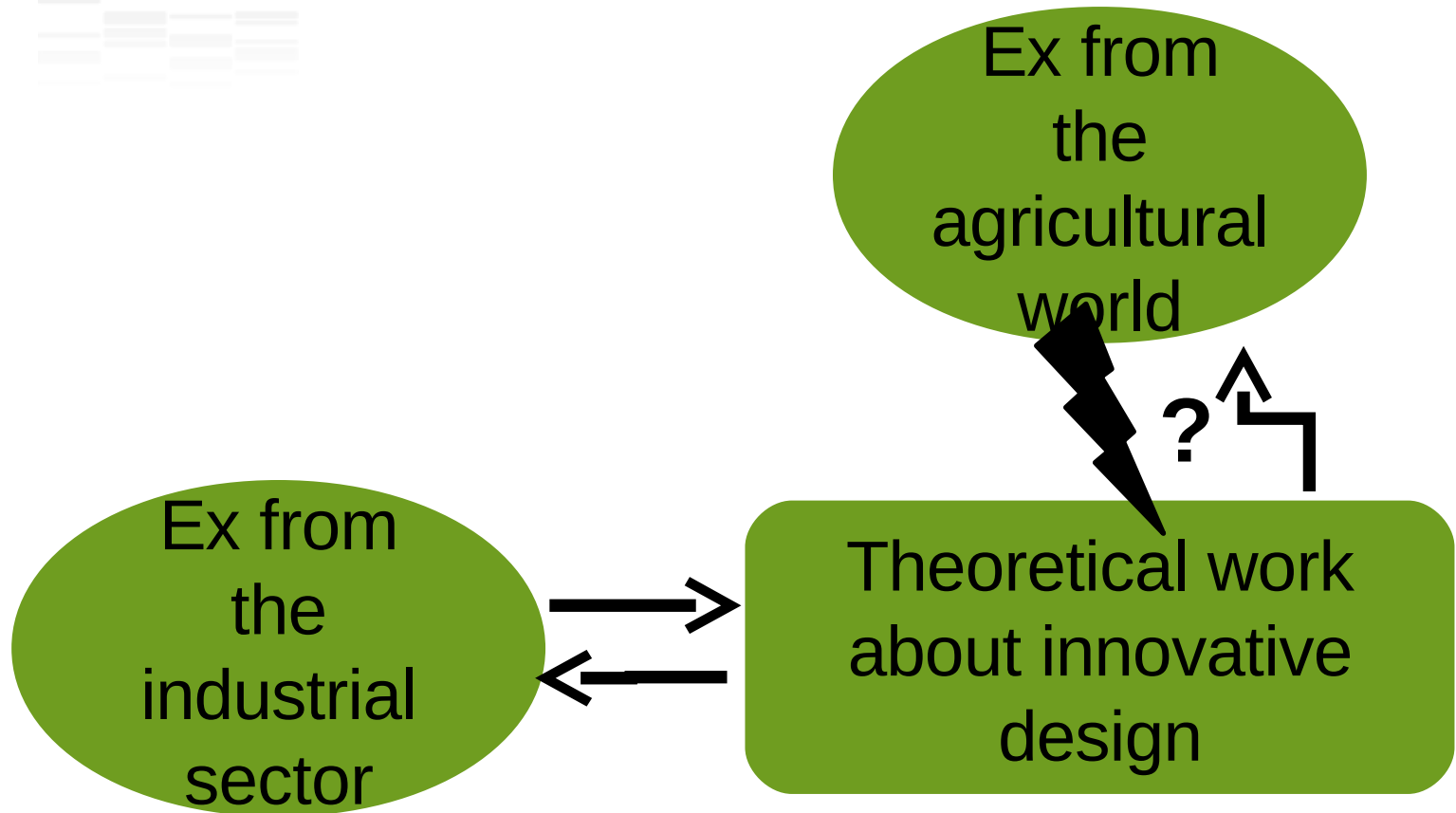
# Specific characteristics of innovative design in agriculture

How may design in agriculture challenge design theory?



Lorène PROST, Elsa BERTHET, Marianne CERF, Marie-Hélène JEUFFROY, Julie LABATUT, Jean Marc MEYNARD

# Introduction



# Introduction

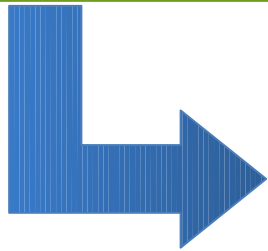
- ❖ Why do we speak of **INNOVATIVE DESIGN** in agriculture?
  - Agriculture is facing new challenges

XXth CENTURY

Centralized design  
ADAPT THE  
ENVIRONMENT TO THE  
DESIGNED OBJECTS

TODAY

ADAPT THE DESIGNED  
OBJECTS TO THEIR  
ENVIRONMENT



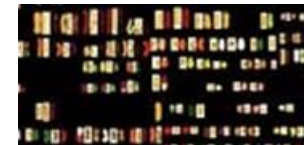
High productivity /  
Environmental and social damages

# Introduction

- ❖ **Why do we speak of INNOVATIVE DESIGN in agriculture?**
  - Agriculture is facing new challenges
  - This requires innovative design as defined by Le Masson et al (2006):
    - Revise the identity of objects (objectives, performance criteria)
    - Revise the design regime and organization



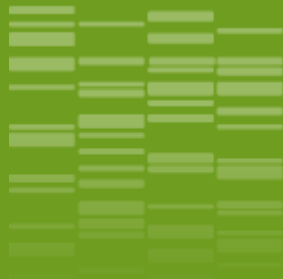
*Agro-ecology*



*Genomics*

# Introduction

- ❖ **What does « innovative design » imply when it comes to biotechnical systems?**
- ❖ **Focus on the nature of our objects + on the characteristics of our design organization**



**01**

# Designing biotechnical systems

# What is “designed” in agriculture?



- Varieties / Animal breeds



- Processes: cropping system, livestock system, farming system = combination of practices

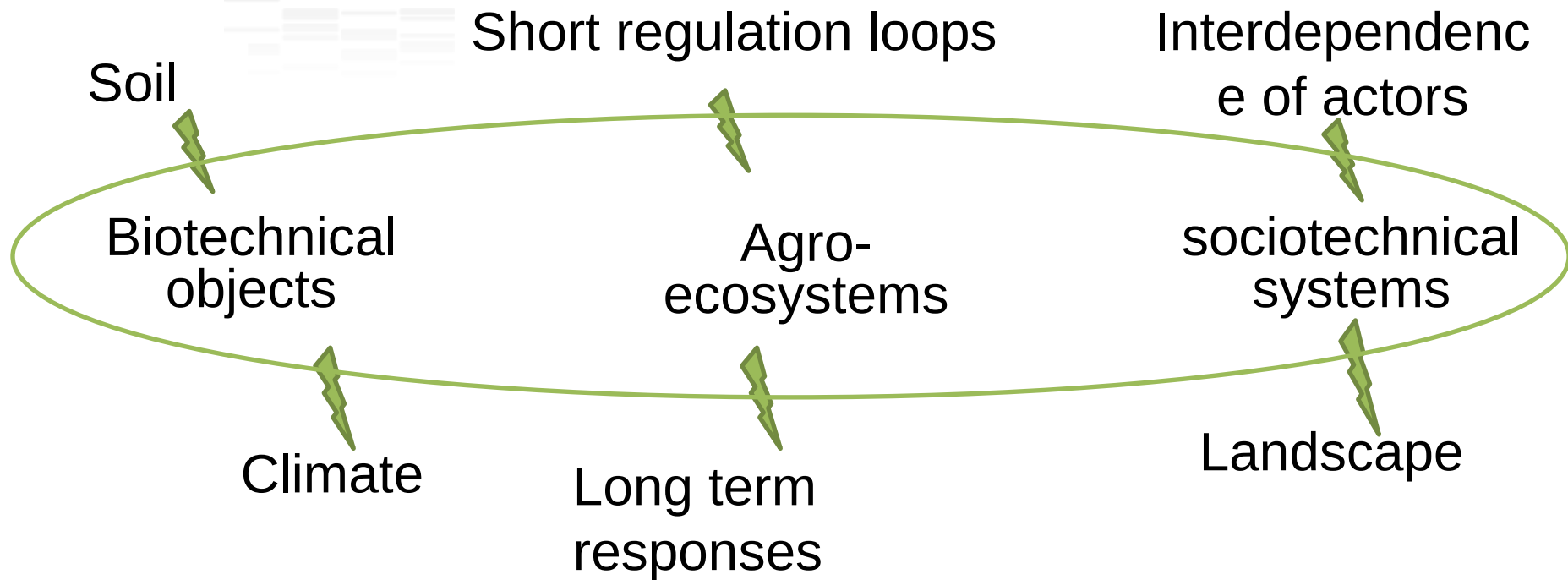


- Landscapes

- Decision support tools



# Objects interacting with their environment



## 1. Constant evolution in link with the environment

**DESIGN IS ONTOLOGICALLY INCOMPLETE**  
let space for the unpredictable interactions with  
the environment

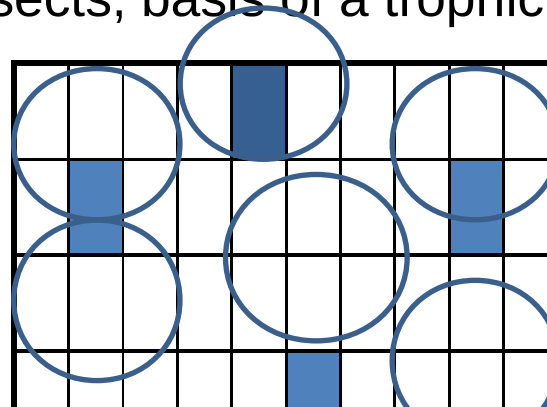
# Objects interacting with their environment

## 2. Designing at different scales

Ex: biodiversity erosion due to agricultural intensification in a cereal crop plain

Scale : agroecosystem (includes ecological processes, regulation loops, interdependence between farmers)

Grasslands: reproduction of insects, basis of a trophic web



Landscape  
mosaic

**DESIGN IS ONTOLOGICALLY SYSTEMIC**  
**Defining borders: strong consequences on “what”  
is designed**

# Objects often related to common goods

## ❖ In agriculture, many objects are managed as common goods

### ▪ Example : ANIMAL BREEDS

- are designed thanks to scientific tools, farmers' practices, processing industries...

- BUT are farmers' collective property

⇒ The design process cannot be “privatized” and managed by a single organization

- Designing such a resource => designing the governance structure to go with it, involving distributed « owners »



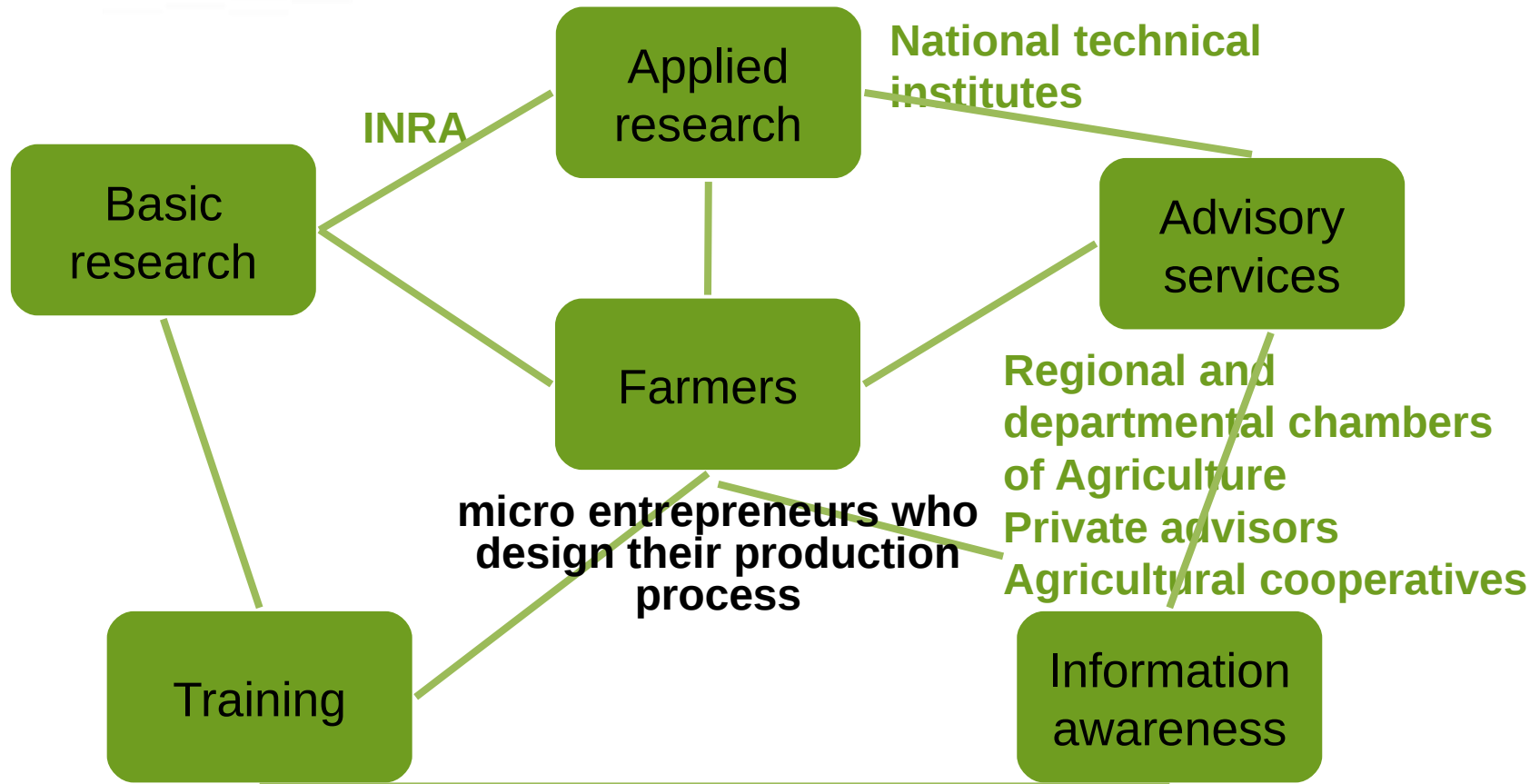
**DESIGNING OBJECTS AND  
ORGANIZATIONS**



02

## Distributed design as an organizational characteristic of the agricultural sector

# Design knowledge and design actors are distributed in agriculture



# Towards new design organizations

- ❖ **Taking into account more stakes and wider scales requires the creation of new design collectives**

Ex: collective design of a sustainable cereal cropped agro-ecosystem (grasslands)

- Who can be in charge of grassland distribution management?
- An agricultural cooperative created an ad-hoc group :naturalists, water syndicates, local authorities, farmers, extension services
- Their aim : solve the conflicting situation by exploring the potential trajectory of the agro-ecosystem





# **04**

**Discussion: how to learn more  
about design theory in studying  
agricultural systems and objects?**

# Discussion

1. Put into question design categories (natural/designed, breeds/brands, etc.)
2. Importance of making more visible collective dynamics, conflicts and controversies in design reasoning
3. Use the C space to catch the political dimension of design



# Discussion

4.

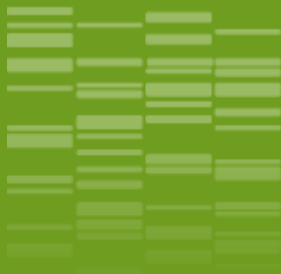
## Importance of “use” situations that would not be reducible to knowledge elements

- Interactions with environment □ some unknown and unknowable in the design process □ large part of design is done in “use” situation
- In CK theory, the “use” situation is described in K space.

specificities ? Long time, life adaptability

- Add a third space to understand how the “real” interacts with knowledge and concept in the design process?





# Thank you for your attention



Lorène PROST - UR SenS

Elsa BERTHET - UMR SADAPT & CGS Mines Paristech

Marianne CERF - UR SenS

Marie-Hélène JEUFFROY - UMR Agronomie

Julie LABATUT - UMR Agir

Jean Marc MEYNARD - Dept. SAD