



Session 4 : Capacity Building in AgriFood systems analysis and design : International collaboration on methods, tools and curriculae

SUPPORTING SUSTAINABLE TRANSITION IN AGRIFOOD SYSTEMS: A “TOOL-BOX” TO FEED OPEN INNOVATION WITHIN SOCIOTECHNICAL SYSTEMS

Marie-Hélène Jeuffroy, Marianne Cerf, Jean-Marc Meynard
and the contribution of numerous colleagues

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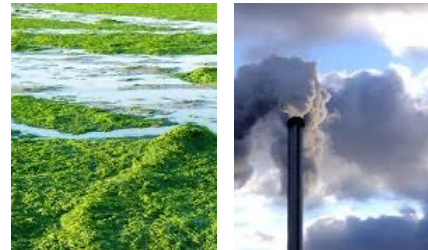
CONTEXT To address numerous current and global issues in agrifood systems, a huge effort for systemic and disruptive innovation is required



Adapt to and mitigate climate change



Decrease pesticide use



Remove air and water pollutions



Improve water quality



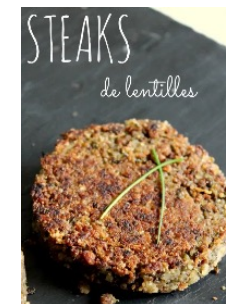
Strengthen the territorial integration of agriculture



Preserve and enhance biodiversity



Improve food quality and quantity



Contribute to food transition



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Our main proposal

To support and develop the innovation capacity of agriculture and food actors who wish to change in the view to move toward healthy and sustainable agrifood systems, the IDEAS scientists developed and used specific methods and tools through **participatory** research-action studies, based on **theoretical frameworks** from ergonomics, design science, transition theory and system agronomy.

We consider **Innovation as a non linear, swirling, collective and interactive process** (*Akrich et al., 1988*): with numerous back and forth between the steps of research, design, development, industrialization and launching.

Our methods allow to **manage collective design processes for innovation in** crop management, cropping systems, landscapes, varieties, equipment, organisations, ... and to **embed them within socio-technical systems** (at individual and organisation levels) open to systemic and disruptive innovations,



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IDEAS proposes methods to develop innovative design in relation to the dynamics of socio-technical systems, based on theoretical frameworks :

Fostering the exploration of systemic and disruptive innovations

Exploration requires methods to avoid dependency paths, fixation effects, simplistic solutions and false 'good ideas'.

(Agogué et al., 2014; Jeuffroy et al., 2022)

Encouraging users' involvement into the design of 'tailor-made' innovations

Involving users from the very first stages of design makes it possible to take better account of the diversity of expectations and situations of use, to adapt innovations to the needs of the actors, to make the most of diverse knowledge

(Béguin and Rabardel, 2000 ; Cerf et al., 2012)

Nurturing design through action

The confrontation of a concept with reality enriches the design process and favours coupled innovations: there is a need for methods to stimulate and capitalise on the learnings derived from this implementation.

(Schön and Wiggins, 1992; Salembier et al., 2020)

Analysing socio-technical systems to better anchor design in the collectives of actors

The actors who design, develop, disseminate and use innovations are not isolated; they operate in sociotechnical systems, characterised by networks, practices, knowledge, technologies, collective representations, norms and rules that they adopt.

(Rip and Kemp, 1998; Belmin et al., 2018)



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The methods we developed

Diagnosis of use situations:

analysing the various ways to realize a task or solve a problem, to stimulate the design activity

(Cerf et al., 2012)

Farmers' innovation tracking:

Identifying and analysing innovative practices and capitalizing derived knowledge to enhance creativity

(Salembier et al., 2021)

Diagnosis of the sociotechnical system:

Analysing barriers and levers to innovation within systems of actors

(Meynard et al., 2018)

Scenario building of territories:

Simulating spatial organizations of cropping systems, taking into account individual and collective issues and local specificities

(Pelzer et al., 2020)

Test of prototype:

Implementing and assessing prototypes (of tools) with their future users in real-life use situations

(Cerf et al., 2012)

Knowledge formalization in open innovations library:

Capitalising scientific and expert knowledge to feed cropping system design processes

(Quinio et al., 2022)

Design workshops:

Managing a dialogue among actors to collectively explore innovative solutions, based on sharing common issues

(Jeuffroy et al., 2022)

System experiment:

Implementing and adapting systemic innovations in real-life situations

(Debaeke et al., 2009)

Step-by-step design:

Supporting farmer—designers in the progressive change of their practices

(Meynard et al., 2012)

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The methods we developed

Define the problem to be solved
and the actors to be involved

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analysing the various ways
to realize a task or solve a
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(Cerf et al., 2012)

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**Diagnosis of the
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(Meynard et al., 2018)

**Scenario building of
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(Pelzer et al., 2020)

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Implementing and
assessing
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with their future
users in real-life use
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(Cerf et al., 2012)

**Knowledge
formalization in open
innovations library:**
Capitalising scientific
and expert knowledge
to feed cropping
system design
processes

(Quinio et al., 2022)

Design workshops:
Managing a dialogue
among actors to
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**System
experiment:**
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The methods we developed

Define the problem to be solved and the actors to be involved

Formulate a wish for the future (desirable unknown)



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The methods we developed

Define the problem to be solved and the actors to be involved

Formulate a wish for the future (desirable unknown)

Formulate, structure and share knowledge, knowing and learnings

Diagnosis of use situations:
analysing the various ways to realize a task or solve a problem, to stimulate the design activity

(Cerf et al., 2012)

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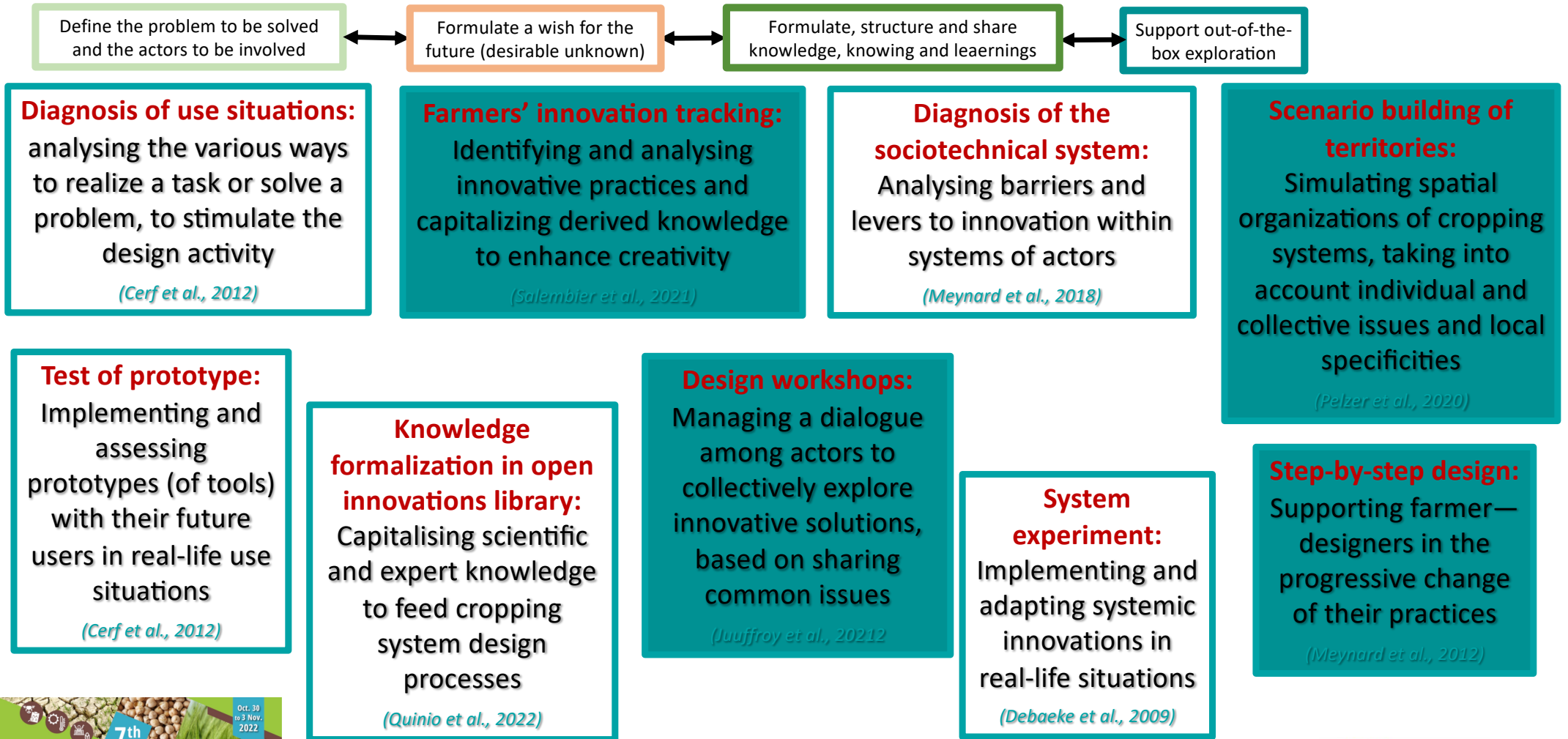
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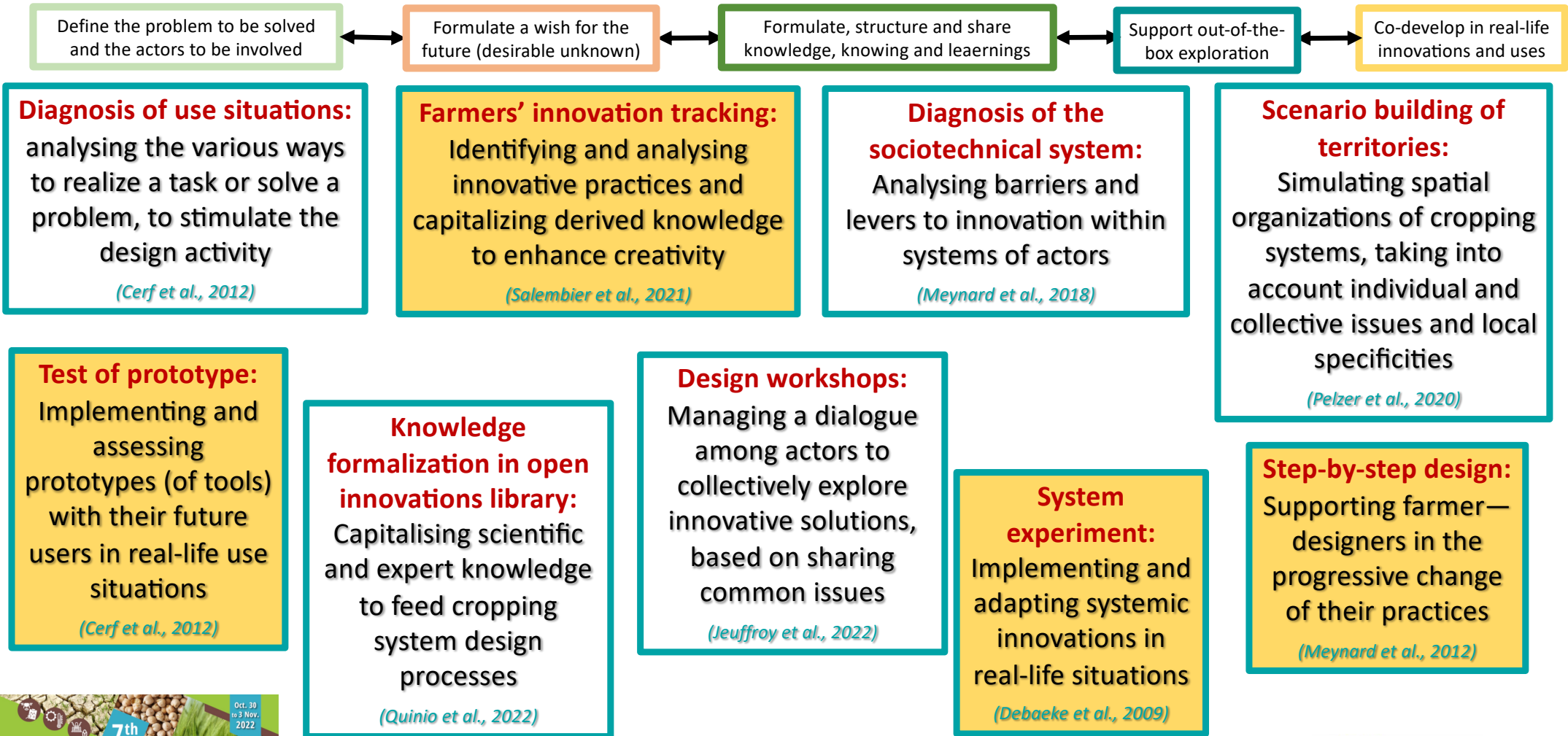
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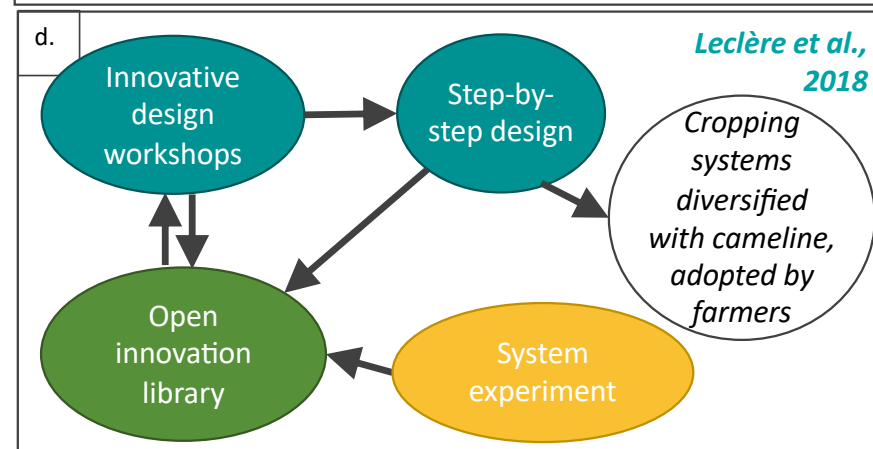
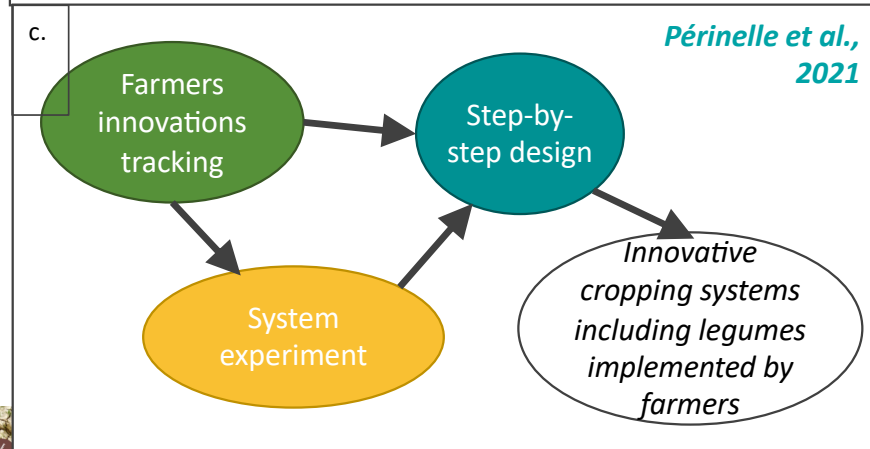
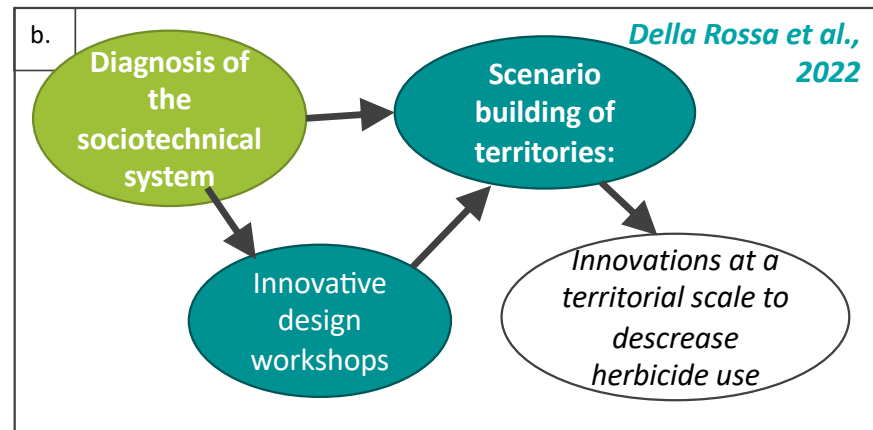
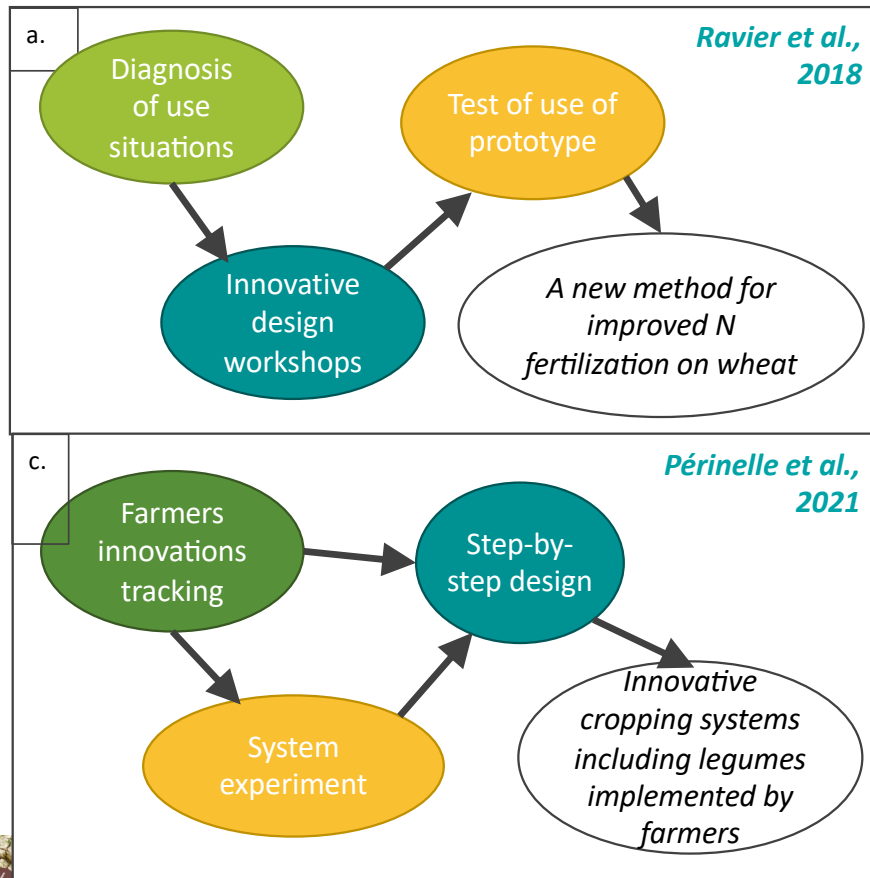
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Combinations of these methods were fitted to the problem to be solved, the target, and the actors involved



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Conclusion

In various projects, combining differently these various methods was successful to support open innovation in agrifood systems, showing their adaptability to various contexts and their contribution to capacity building of the concerned actors in innovation for transition.

Scientists from the IDEAS network conduct research studies on these methods, and contribute to equip the actors of the agrifood systems and the students with these methods, through learning and training, thus enhancing agrifood system transition.



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Thank you for your attention!

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