

designing



**in transitioning
agrifood
systems**



to innovate

IDEAS is a network of scientists from various disciplines who have joined forces to collaborate around the design of complex farming and food systems. Their aim is to foster the evolution of techniques, behaviours, activities, and forms of organization that support the transition towards sustainability, in a context of controversy over necessary disruptions in current farming, agro-industrial, food and consumption models.

DESIGNING

Designing



IDEAS works on the creative and reasoning processes surrounding design, to simultaneously generate innovation-related knowledge and concepts on farming practices and transformation processes of bio-products, varieties, decision-making tools, landscapes, foodstuffs, etc.

TO INNOVATE

Innovate



Developing innovations that offer new articulations between production, processing and consumption within transitioning agrifood projects.

HOW ?

IDEAS is...

A network of scientists

40 scientific researchers and (associate) professors wishing to pool their activities pertaining to the design of complex agrifood systems.

A training space

Under-graduate courses and continuing education to develop an innovative, open and distributed design culture and to acquire skills in the design and implementation of these innovation approaches.

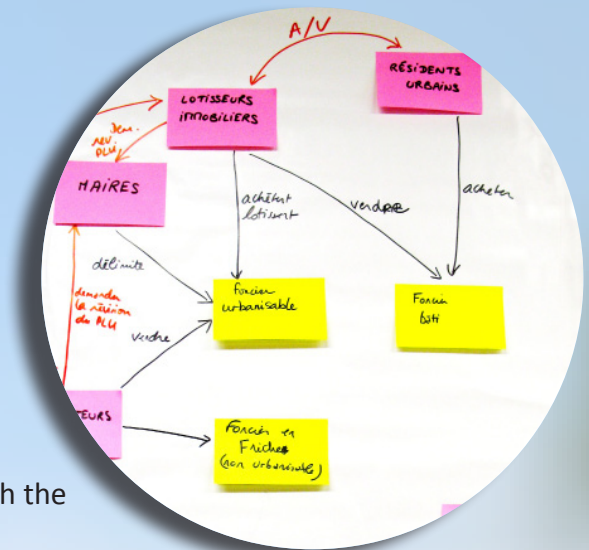
A resource centre

- > A skills network
- > Handbooks, software programs, foresight scenarios, usage scenarios, fablabs, collaborative tools, systems analysis tools
- > A partnership dynamic (RMT, UMT, R&D&I projects)

For innovative, open and distributed design

PRODUCING KNOWLEDGE

- › On interactive and participatory (cognitive and organizational) processes in design, necessary for agrifood systems to evolve
- › On the articulation between design and the transition dynamics within sociotechnical systems
- › On design regimes in farming and their articulation with the production of scientific knowledge



SUPPORTING AND TRAINING FOR THE USE OF...

- › Scenario-building methods to envisage new agricultural practices and consumption patterns and to simulate related activities
 - › Participatory methods for structuring an open and distributed design process
 - › Handbooks, databases and software programs that can be used to generate innovation concepts and produce the knowledge needed for their development
 - › Analysis of needs and socio-technical systems to embed the design process in a transition dynamic
 - › Collaborative tools to develop, share, and build on knowledge and experience in order to support the design of agro-ecological systems



IIDEAS was born from the desire of three INRA divisions, Sciences for Action and Development (SAD), Environment and Agronomy (E&A) and Characterization and Elaboration of Agricultural Products (Caractérisation et Elaboration des Produits issus de l' Agriculture, CEPIA), in coordination with AgroParisTech, to create synergies between the work carried out within their units in the Paris region, on and for design. The aim is also to foster interactions between scientists for whom design is a goal, and those for whom it is a research subject. IIDEAS brings together a range of disciplines: agronomy, food and bio-product science, (bio)-processing engineering, ecology and genetics, zootechnics, the humanities and social sciences, and modelling.

As of 1 January 2017, the scientists involved were mainly from units from the Paris region working on agricultural and food design (UMR Agronomy, Genial, GMPA, GQE, Lisis, Sadapt, the UAR EcoInnov). They are developing collaboration with units working in other fields (UMR i3, CNAM's CRTD, LGI Centrale Supélec).

A few examples of our outputs

RESEARCH projects

Articles on design in sociotechnical systems combining different disciplinary perspectives:

- J-M Meynard, M-H Jeuffroy, M Le Bail, A Lefèvre, M-B Magrini, C Michon (2017). **Designing coupled innovations for the sustainability transition of agrifood systems**. *Agricultural Systems* 157, 330-339
- L Prost, E Berthet, M Cerf, M-H Jeuffroy, J Labatut, J-M Meynard. **Innovative design for agriculture in the move toward sustainability : scientific challenges**. *Research in Engineering Design*, Springer. DOI.1007/s00163-016-0233-4

Enhanced collaboration with scientific partners working in the field of design, through jointly supervised projects:

- How to consider work in the design process of agroecological systems. PhD M.Chizallet, supervision by L.Prost, INRA, and F.Barcelini, CNAM-CRTD
- Combining design and on-farm innovation tracking to develop agroecological practices. PhD C.Salembier, supervision by JM. Meynard, INRA, B. Segrestin and B.Weil, CGS Mines-ParisTech
- Collaborative design of agroecological systems: formalization and uses of a tool for knowledge management (GECO). PhD M.Quinio, supervision by M-H Jeuffroy, L Guichard, INRA, and F.Détienne, SES Telecom
- Ecosystems for data management in the digital age for use and added-value oriented towards farmers engaged in agroecology. Engineer supervised by M.Cerf, INRA, A.Jullien, AgroParisTech, and V.Fernandez, SES Telecom.

Development of cross-disciplinary activities between INRA and APT teams:

- **INDISS project**, funded by LabEx BASC: stimulating collective innovation capabilities, by sharing and fine-tuning the methodological resources needed for the innovation process, and analysing its relationship to knowledge production.
- **ICAD Project** (under development): Designing combined innovations (agricultural production, food) to meet the challenges of collective catering in the Ile de France region, under the "sustainable food plan" of the Mairie de Paris

TRAINING Projects

Ongoing work on the use of innovative design in teaching at AgroParisTech

Multi-disciplinary supervision of Master's internship and PhD theses on design in agrifood systems

School of Research «Fostering interdisciplinary research and innovation through innovative design» (January 2018), organized by IDEAS and INRA's Animal Health division.

Training with researchers and R&D actors: How to run an innovative design workshop? How to build usage scenarios to test prototypes?

RESOURCES under development

IDEAS scientists have developed the means to foster and support design in various fields: assistance with the design of cropping systems to manage water quality in a territory; assistance with the design of varietal mixtures; assistance with the design of new food processing processes; etc. An analytical framework developed within IDEAS allows scientists and their partners to better assess the performance of these approaches in relation to the challenges they address.

INNOVATION PRODUCTION examples

A new method for N fertilization on wheat, based on the Azodyn model and crop INN monitoring, as well as on accurate management of the wheat tolerance to nitrogen deficiencies, is now available and a prototype is on test by farmers and advisors. This method does not require the definition of a yield target or the measurement of the soil's N content in winter

An interdisciplinary and facilitating team, M-H Jeuffroy (INRA Agronomy unit) ; M. Cerf et L. Prost (INRA Lisis unit) ; J-M Meynard (INRA Sadapt unit) ; C. Pénicaut (INRA GMPA unit); G. Yannou-Le Bris (AgroParisTech)

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