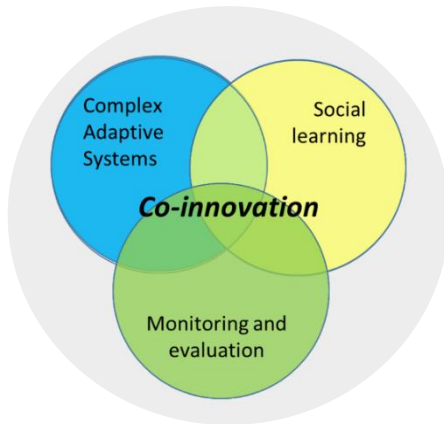


Crafting co-innovation

Walter Rossing, Farming Systems Ecology, Wageningen University

With inputs by many



Flow in the presentation

- Once upon a time
- Producing actionable knowledge
 - Analysis and design
 - For ecological intensification
 - Through projects
- Producing actionable knowledge through co-innovation
- Recent example DiverIMPACTS
- Lessons and questions



Once upon a time...



EIPRE – computer-based advice on pesticide application in wheat

- Contacts with growers crucial
- Defining the system properly
- Strength of agency (Zadoks, Rijdsdijk)



European Journal of Plant Pathology 103: 217–234, 1997.
© 1997 Kluwer Academic Publishers. Printed in the Netherlands.

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Operationalizing sustainability: exploring options for environmentally friendly flower bulb production systems

Walter A.H. Rossing¹, Jan Eelco Jansma¹, Frank J. De Ruijter² and Jan Schans²

¹ Dept. of Theoretical Production Ecology, Wageningen Agricultural University, P.O. Box 430, 6700 AK Wageningen, The Netherlands (Fax: +31-317-484892); ² DLO Research Institute for Agrobiology and Soil Fertility AB-DLO, P.O. Box 14, 6700 AA Wageningen, The Netherlands (Fax: +31-317-423110)



ELSEVIER

European Journal of Agronomy 7 (1997) 271–283

**European
Journal of
Agronomy**

Model-based explorations to support development of sustainable farming systems: case studies from France and the Netherlands

W.A.H. Rossing^{a,*}, J.M. Meynard^b, M.K. van Ittersum^a

Prototyping and model-based exploration

- Proposed as complementary
- Field & farm levels
- Diagnosis, design, testing, dissemination
- Values and biophysical knowledge

Actionable knowledge

Context-specific knowledge that ***assists actors*** in their decision-making to be better positioned to ***achieve their goals***.

Producing actionable knowledge

“Transformative knowledge”

Design/Select:
Which?

Plan:

Which

improvements?

Explore:
what if?

Action:

Implementing a
'bright idea'

DESIGN

ANALYSIS

Analysis:

What are
implications?

Describe:
what?

Observation:

Find out
consequences

Explain:
why?

“Systems knowledge”

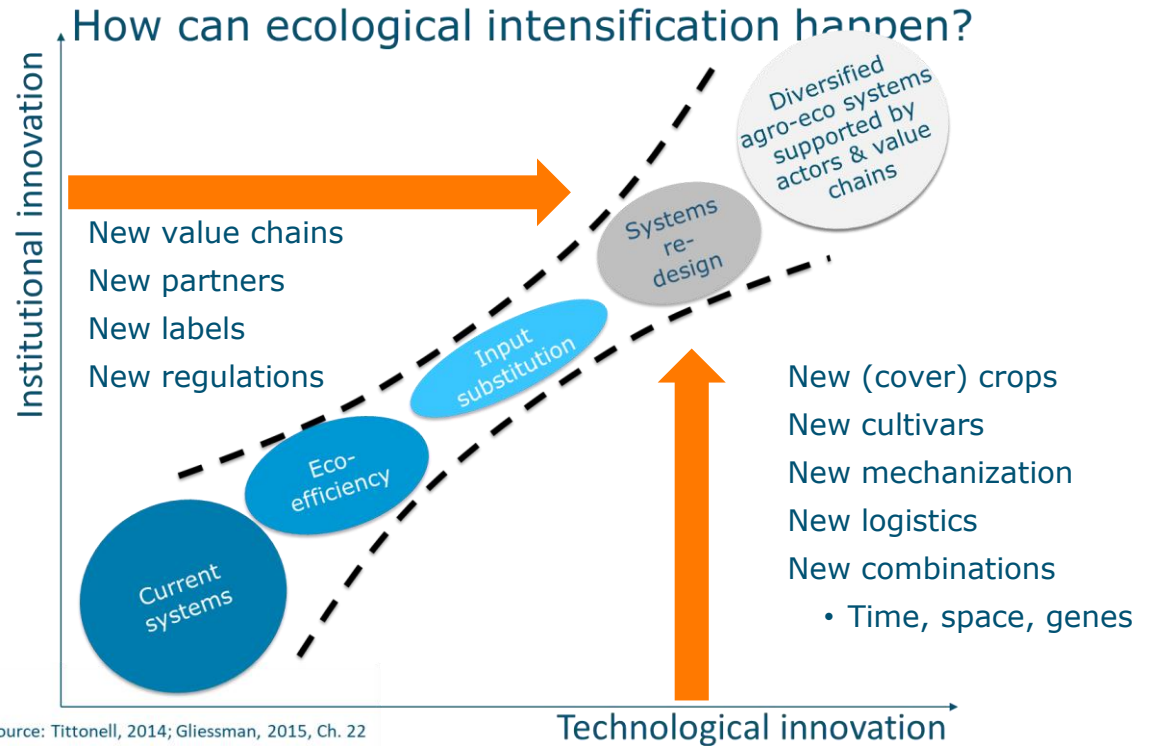
Kolb's 1984 Learning cycle
Giller et al's 2001 Research cycle

Ecologically intensive agriculture

Approaches to agricultural production based essentially on the use of biological regulation to manage agroecosystems (Doré et al., 2011)

Eco-functional intensification (Levidow et al., 2012)

Biodiversity-based agriculture (Duru et al., 2015)



Source: Tiftonell, 2014; Gliessman, 2015, Ch. 22
Hill & MacRae, 1986

Projects: the dominant way of organizing science

Research and Innovation

Seventh Framework Programme: Building the Europe of Knowledge

At the heart of the Lisbon Strategy, research is a component of a knowledge triangle (the other two being education and innovation) meant to boost growth and employment in the European Union (EU) in the context of a global economy. The 7th Framework Programme for Research, covering the period 2007 to 2013, is an opportunity for the EU to match its

Search

of Youth > Research >

Research projects | Universiteit Utrecht

current research projects.



<https://www.uva.nl/> conservation-and-restoration > res... >

Research Projects - University of Amsterdam

Many conservation research projects of the UvA Conservation Department are carried out in collaboration with our research partners or within national and ...

<https://www.wur.nl/> Information-for-students > Resear... >

Research projects - WUR

Below a complete list of research projects currently performed at WUR is given. In many of these projects there are possibilities for BSc ...

<https://www.ru.nl/> rich > our-research > research-groups >

Current research projects - Radboud Institute

An overview of the current running research projects by the research groups in the Radboud Institute for Cultural Historical Demography and Family History.



Home > Research and innovation >

Horizon Europe

Research and innovation funding



European Commission > Funding, Tenders >

Horizon 2020



What is Horizon 2020?

Find Your area



UNIVERSITY & RESEARCH

100years
1918 — 2018



Find funding Research policy NWO

Find Funding

Find Funding

Each year, NWO invests almost 1 billion euros in curiosity-driven research, research related to societal challenges and research infrastructure.

Researchers and research institutions can submit an application for funding for research projects, large equipment and databases as soon as NWO publishes a call for project proposals. Here you find all funding opportunities that NWO offers.

All calls

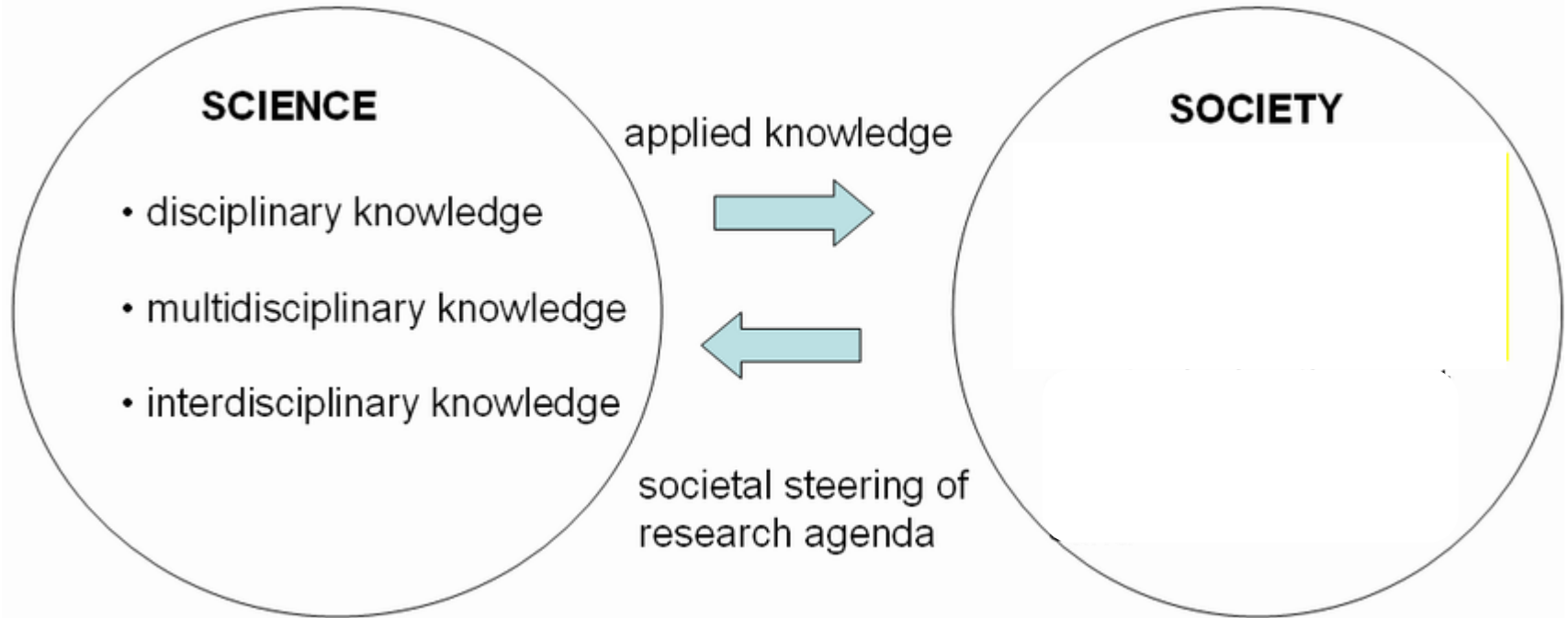
The call for proposals describes the aim of a grant round, who can apply, the amount of money

Perspectives needed for actionable knowledge

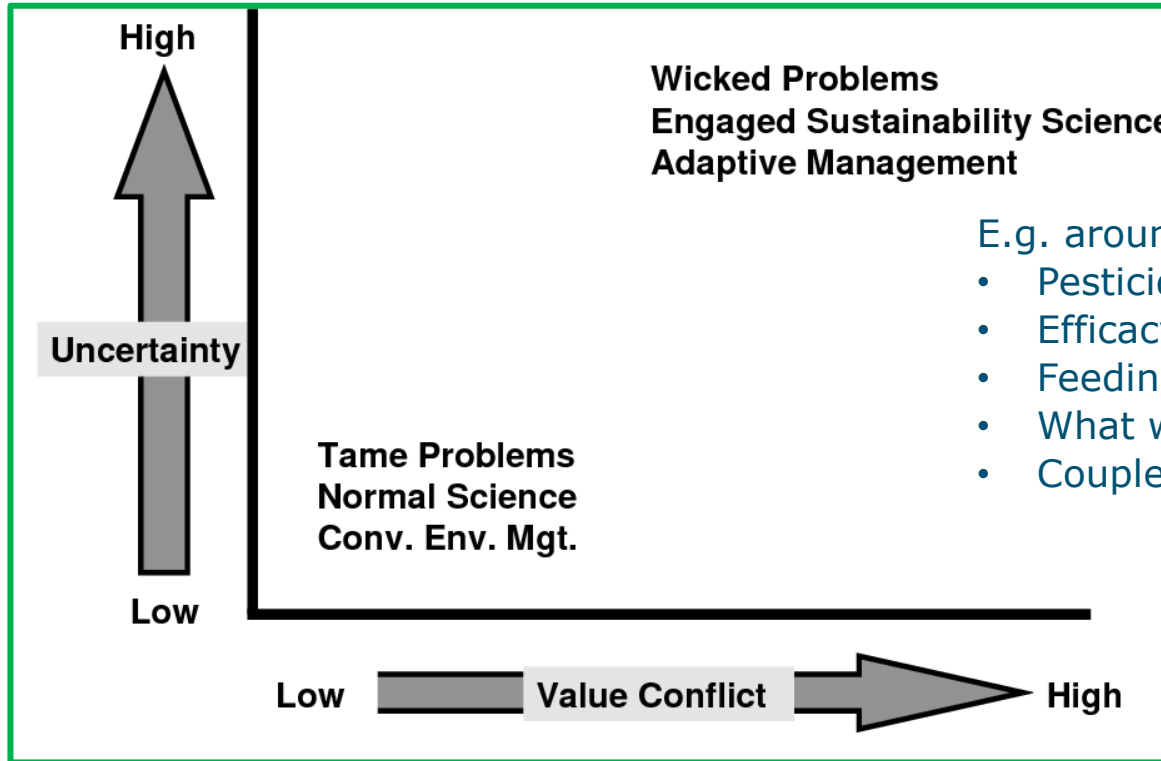
- Innovation system: co-development versus 'rolling out'
- Complex system: expect unexpected behaviour
- Adaptive system: managing for optimality based on control versus adaptation based on monitoring (safe-to-fail systems)
- Political system: determines what is salient, credible, legitimate. Trust may involve 'taking sides'.



How to organize science for such transformation?



Wicked problems



- E.g. around pesticides
- Pesticides are acceptable?
 - Efficacy of alternatives?
 - Feeding the world narrative
 - What will my neighbours say?
 - Coupled advice+sales

Crafting to address the 'how-to' question



Contents lists available at [ScienceDirect](#)

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Review

Ten essentials for action-oriented and second order energy transitions, transformations and climate change research

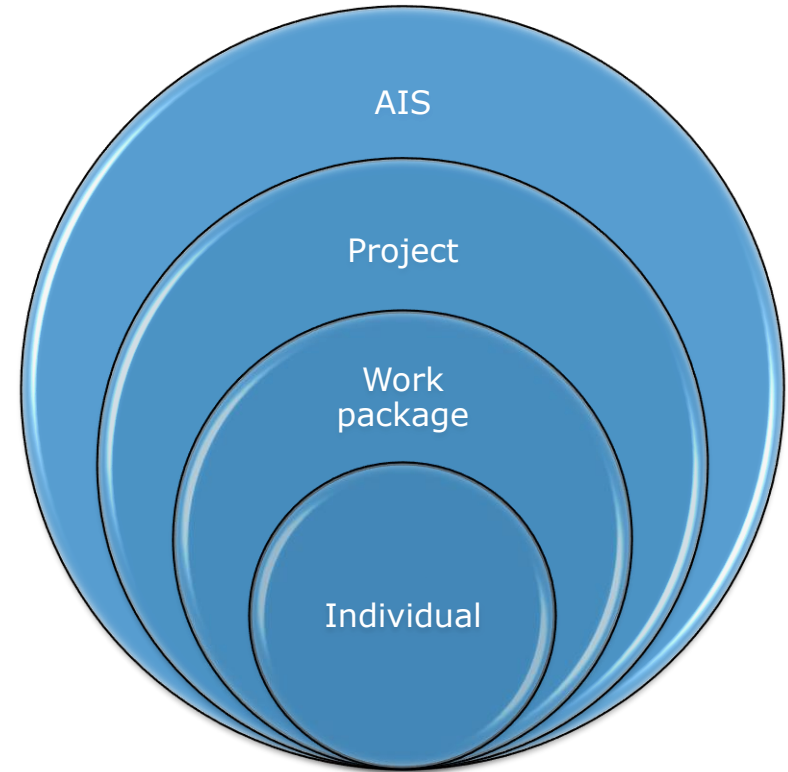
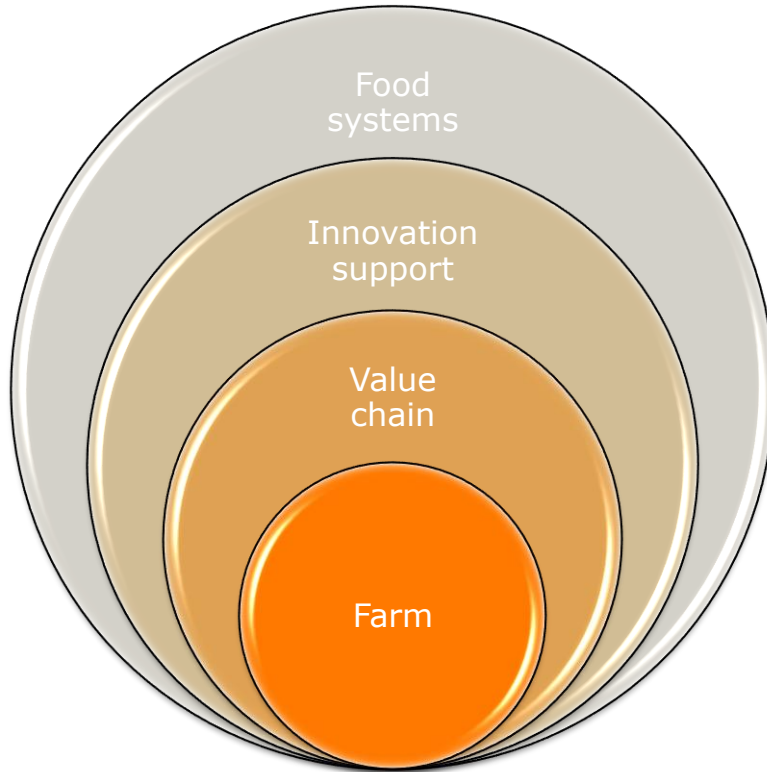
Ioan Fazey^{a,*}, Niko Schöpke^b, Guido Caniglia^c, James Patterson^d, Johan Hultman^e, Barbara van Mierlo^f, Filippa Säwe^e, Arnim Wiek^g, Julia Wittmayer^h, Paulina Aldunceⁱ

“Yet despite the vast amount of knowledge already accumulated, there is still limited emphasis on understanding how to implement change. This ‘how to’ question is now arguably the most important question for climate research.”

Math. Welteholz, Mel. Wood, James. Wetherill

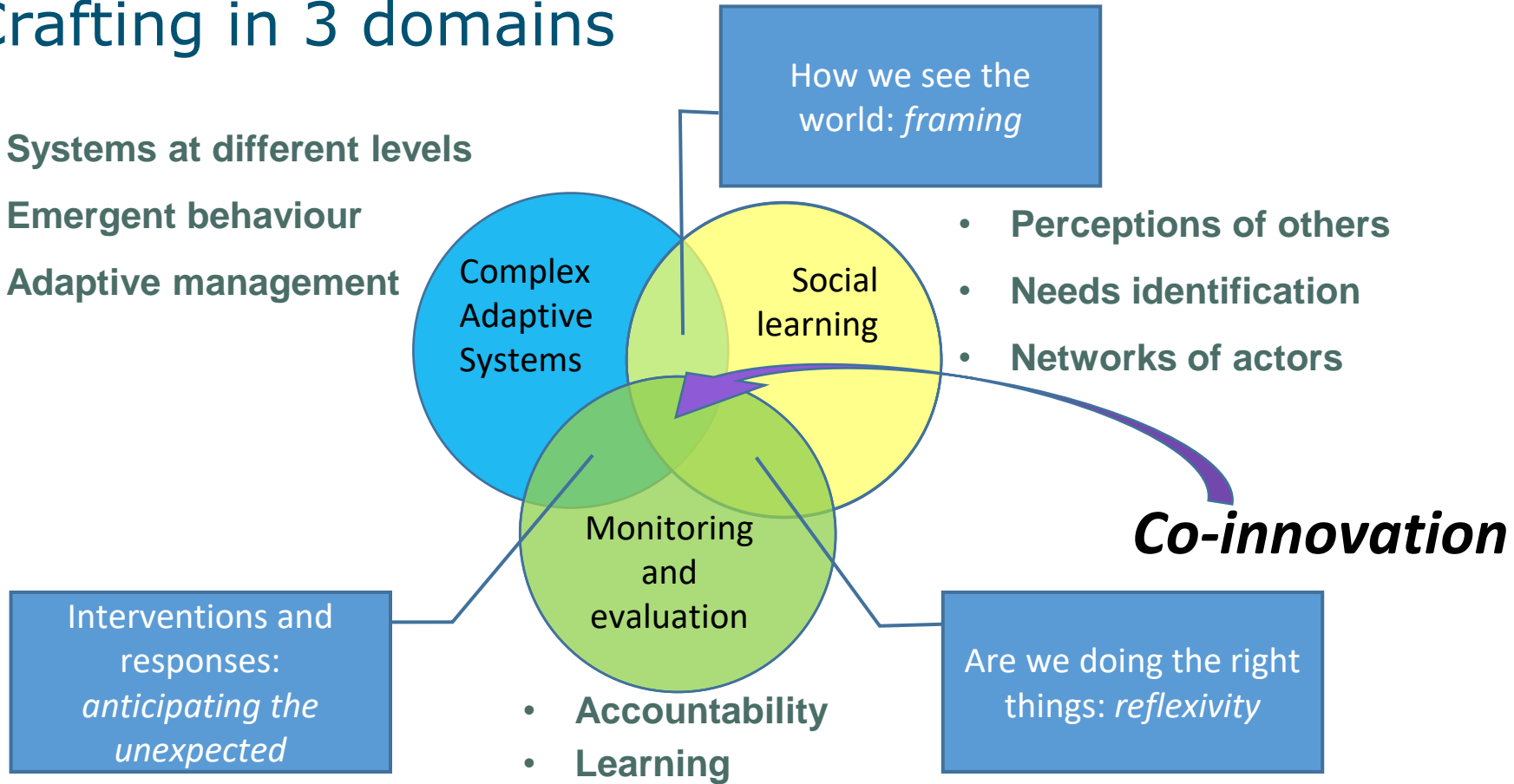


Crafting at multiple levels



Crafting in 3 domains

- Systems at different levels
- Emergent behaviour
- Adaptive management

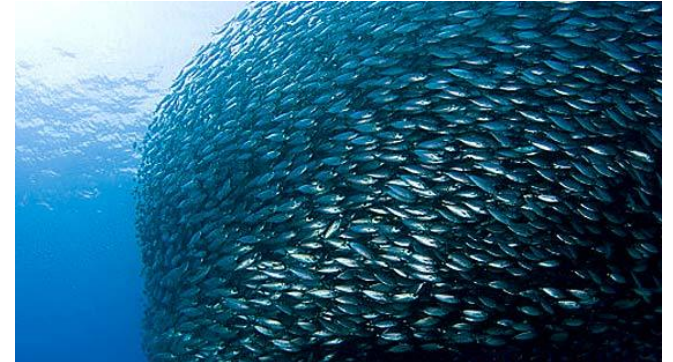


The three co-innovation domains

- **Complex Adaptive Systems:** agents, artifacts and strategies; learning selection
 - Foster variation (agents, strategies, interaction patterns) to stimulate novelty creation; support survival of effective ones
- **Social Learning:** the way collaboration changes individual values and behaviour, in turn affecting collective culture and norms
 - Regular events, safe spaces, common format
- **Monitoring and evaluation:** which and how project results are produced to assess if project actors still agree on project directions
 - Formative, accountability, summative

Co-innovation: guiding principles

- A change-oriented project works within a societal system that consists of agents, artefacts, strategies and constitutes a Complex Adaptive System
- A change-oriented project itself constitutes a CAS
- Change at all levels is driven by 'Learning Selection' in analogy with natural selection (Douthwaite, 2002)
- Change is an emergent property from the reflexive interaction of agents, artefacts and strategies

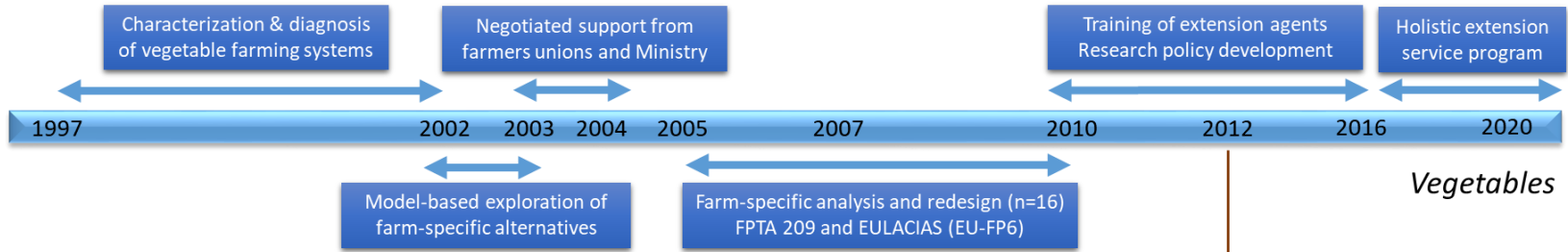


Consequences for project organization

- Foster variation in agents, artefacts, strategies
- Stimulate (unexpected) changes in interaction patterns
- Support selection processes to assess fitness of a novelty, and better allow survival and spread

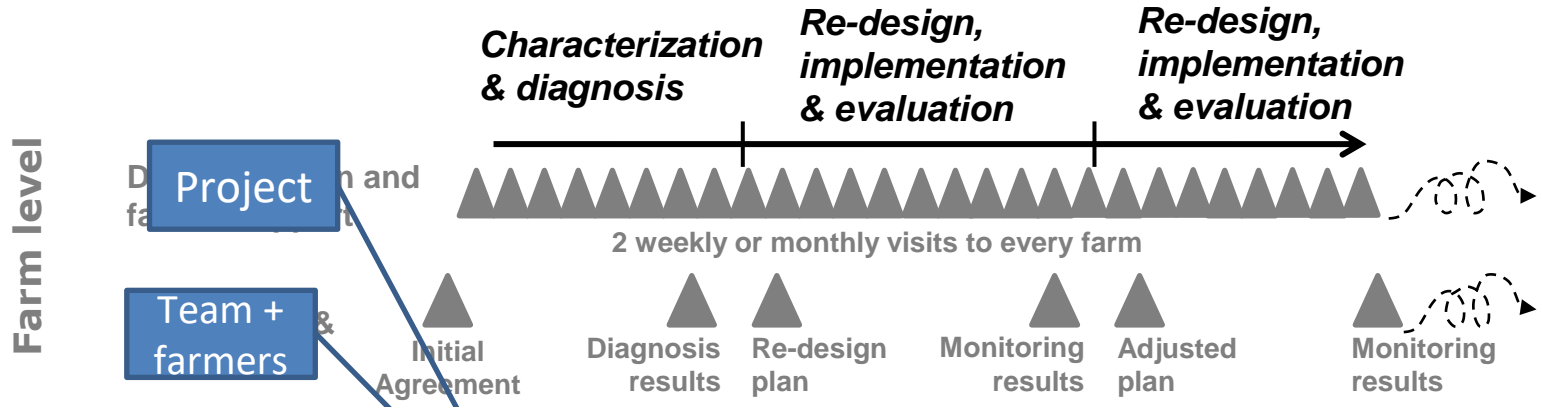


Co-innovation from 1997-2020

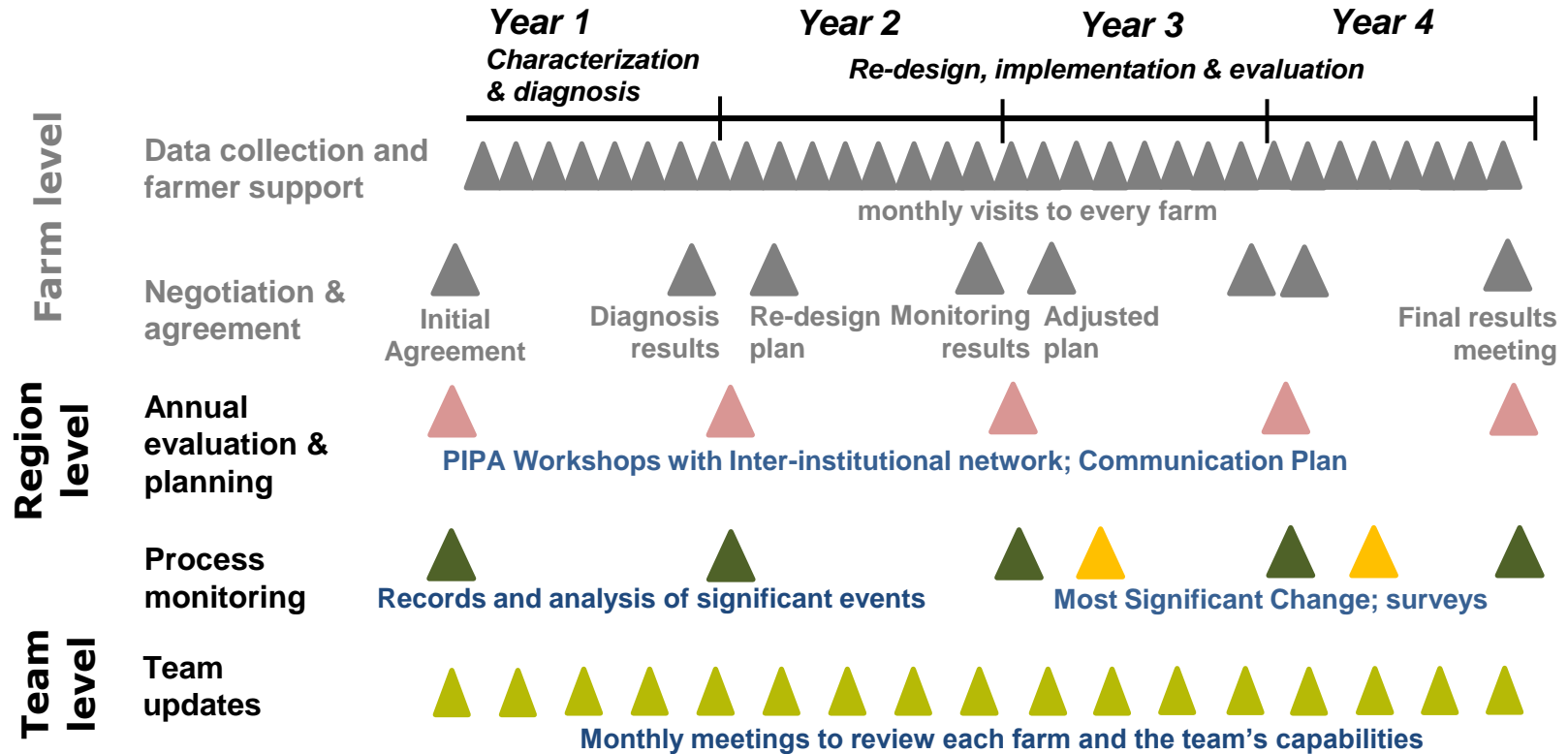


Pedigree of co-innovation projects in Uruguay and Europe

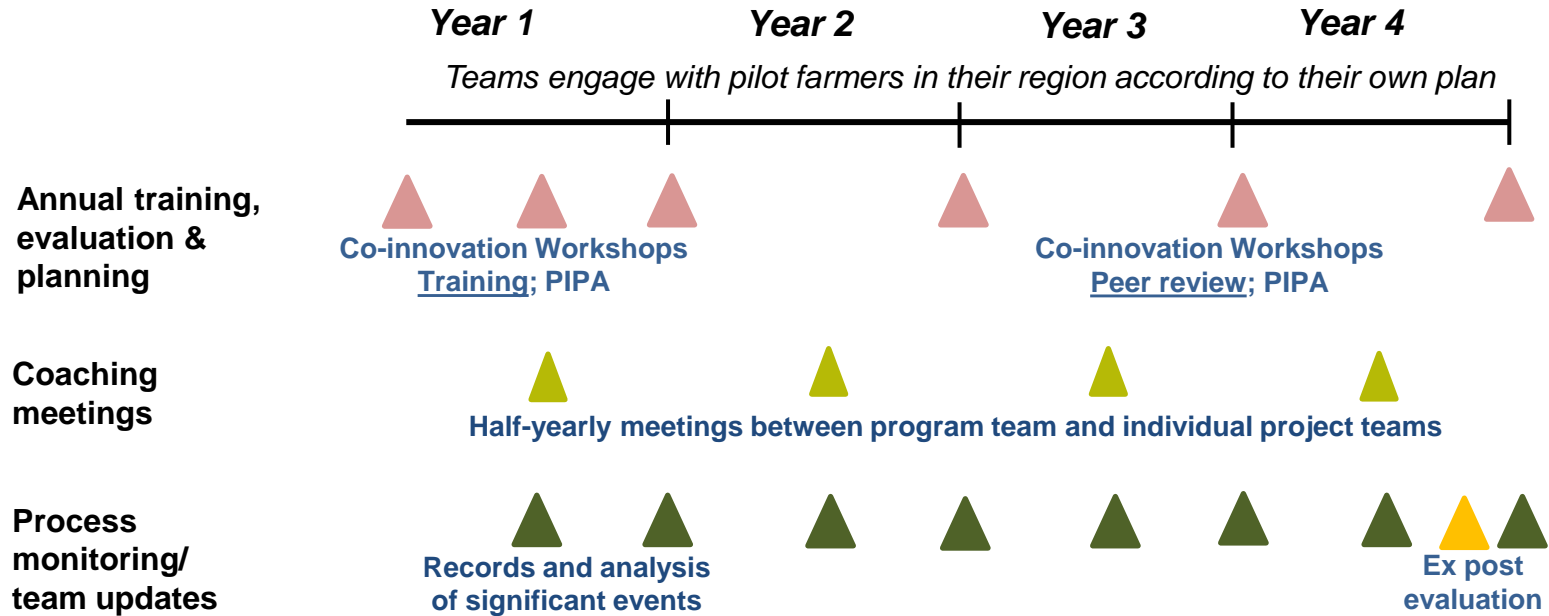
Activity timelines EULACIAS



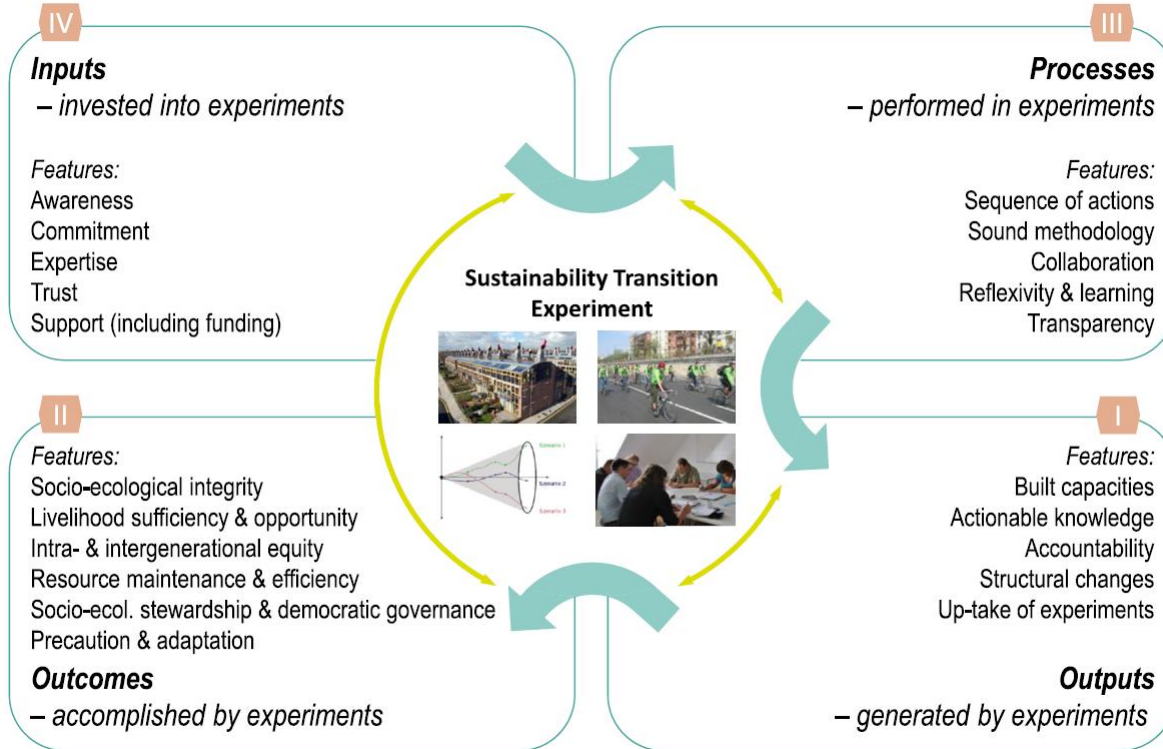
Activity timelines Rocha



Activity timelines PURE



Evaluation of sustainability transition experiments



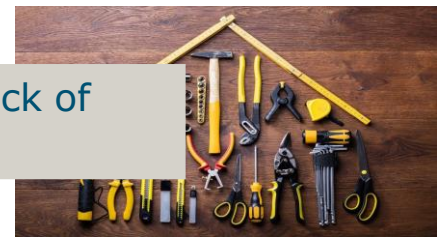
- ‘Tentative evaluation scheme’
- Follows log-frame, but starting from outputs dimension
- Indicators per dimension
- Need for iteration as part of learning

Evaluation of sustainability transition experiments

Luederitz et al., 2017; J. Cleaner Prod.

Evaluative dimensions		EULACIAS	Rocha	PURE-1	PURE-2	PURE-3	PURE-4
Outputs	Built capacities	5	5	4	5	2	2
	Actionable knowledge	4.5	4.5	4	4.5	2	1
	Accountability	5	5	2.5	5	2	1
	Structural changes - physical structures	5	5	3	5	1	1
	Structural changes - societal realms	4	4	3	4	1	1
	Facilitate uptake - transferability	5	5	3	5	2	2
	Facilitate uptake - scalability	4	4	3	4	2	2
	Facilitate uptake - unintended effects	2	2	3	4	2	2
Outcomes	Socio-ecological integrity	5	5	3	4.5	1	1
	Livelihood sufficiency & opportunity	5	5	4	5	1	1
	Intra- & intergenerational equity	4.5	4.5	3.5	4.5	1	1
	Resource maintenance & efficiency	4	4	3	4	1	1
	Socio-ecol. stewardship & democratic governance	5	5	3	4.5	1	1
	Precaution & adaptation	4	4	4	4	2	2
Processes	Sequence of actions	5	5	3	4	3	1
	Sound methodology	5	5	5	5	2	2
	Collaboration	4	5	4	4	3	2
	Reflexivity and learning	5	5	5	5	5	5
	Transparency	4	4	4	4	4	4
Inputs	Awareness	5	5	5	5	5	5
	Commitment	5	5	5	5	3	1
	Expertise	5	5	4	4.5	2	2
	Trust	5	5	4	5	2	2
	Support (incl. funding)	5	5	3	3	2	3

Crafting – overcoming barriers



“We are researchers”
 “I have run out of time in the project”

Researchers felt lack of access to farmers

Institutional level	Institutional dimension
Personal	Professional identities, roles and routines of researchers
Community and organization	Composition of the pilot team
	Fixed institutional roles and objectives
	History of the pilot
	Fixed rules in the project
Agricultural innovation system	Fixed rules in the national AISs
	Country-specific cultural norms

National versus local mandates in advice and research organizations

Acceptance of complexity-aware approaches

Co-innovation for project governance: example

- What is the role of a project in systems transformation?
- What project governance for effective change?
- How to keep energy high in the project on a daily basis?



DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple Cropping, Promoted with Actors and value-Chains towards Sustainability

DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple

Delegation for Scientific Expertise, Foresight and Advanced Studies



About DiverIMPACTS

The overall goal of DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple Cropping, Promoted with Actors and value-Chains towards Sustainability - is to achieve full potential of diversification of cropping systems for improved productivity, delivery of ecosystem services and resource-efficient and sustainable value chains. DiverIMPACTS receives funding of the European Union's Horizon 2020 programme. [More](#)

News

Page 1 of 8. 1 2 3 ... 8 Next

July 10, 2019

Italian field day on strip cropping and DiverIMPACTS case study 22

On June 16th, 2019, the Associazione Sviluppo Rurale (ASR) in cooperation with the farm Coste del...

[Read more](#)

July 04, 2019

Field visit about intercropping with grain legumes attracts attention

About 50 farmers, advisors, scientists and stakeholders from the value chain came to the FIBL field...

[Read more](#)

June 04, 2019

DiverIMPACTS meeting in Alnarp, Sweden

From June 3 to 5, 2019, the second annual meeting of the DiverIMPACTS project—took place in Alnarp,...

[Read more](#)



WEBINARS



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EVENTS

Innovation Case Studies



diversification: obstacles
vers

forms and supply chains

ard, A. Messéan, A. Charlier, F.

I. Farès, M. Le Bail, M.B. Magrini, I.

3. Crop diversification: obstacles and
y of farms and supply chains. Synopsis
y report, INRA, 52 p.

l out by INRA
es in charge of Agriculture and Ecology



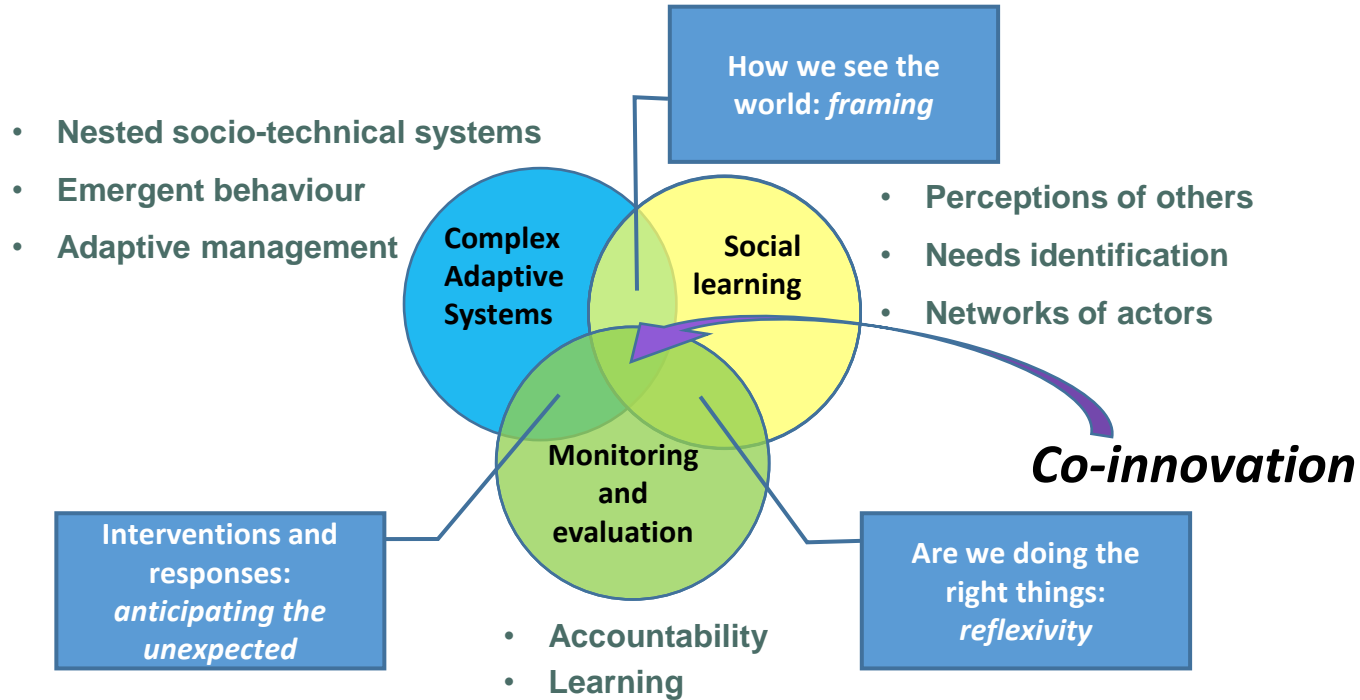
DiverIMPACTS entry points to Research&Innovation



- Transforming mono-cropping requires *actionable knowledge*
 - *Context-specific* knowledge that *assists actors* in their decision-making to be better positioned to *achieve their goals*
- Consider projects as temporary travel companions to innovators
 - Think long-term, act in the short term, take time for a legacy
- Accept complexity in R&I: change happens in unpredictable ways
 - Use context-sensitive R&I project governance
- ‘Crafting’ a context-sensitive R&I approach is legitimate
 - The only failure is the failure to learn from unexpected developments

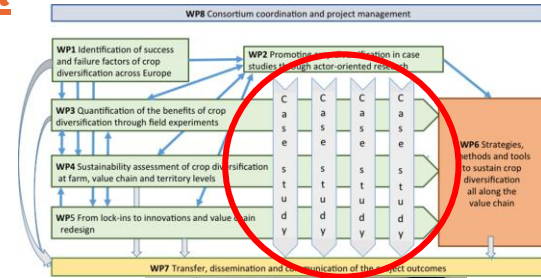


Co-innovation: framework for context-sensitive R&I governance



Context-sensitive governance at project level

- Use WP matrix, balancing research and innovation
- Promote learning between WPs and Case Studies towards project impacts
- Monitor knowledge exchange between WPs and CSs
- Respond to emerging needs: webinars, seed money



TASK BY CASE STUDY MATRIX IN DIVERIMPACTS, STATUS 24 MAY 2019

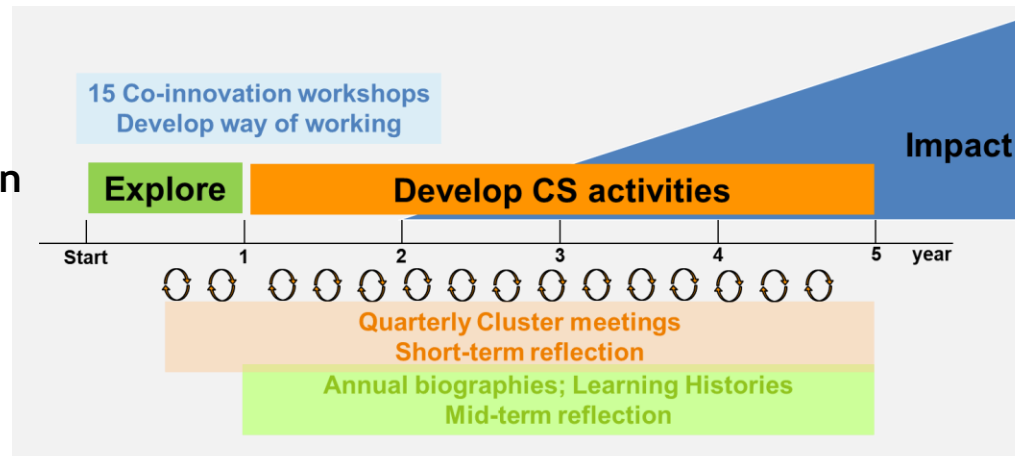
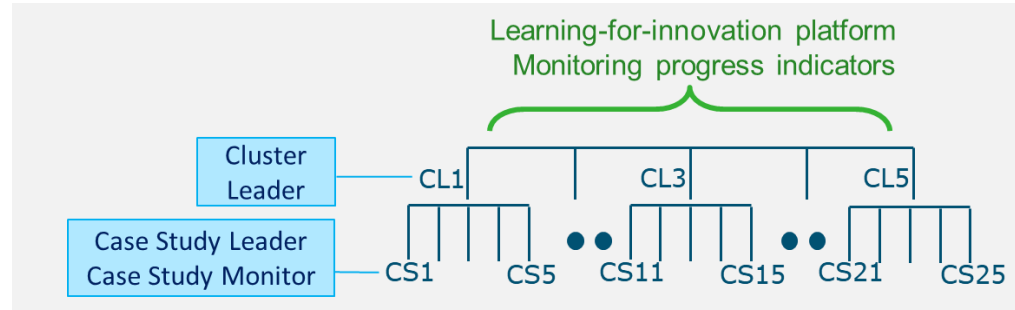
		Task 2.3.	Task 4.2.	Task 4.3.	Task 4.4.	Task 5.2.	Task 5.3.	Task 5.4.	Task 5.5.
		Design	Reference	Validation	Validation	Farm level	Addressing barriers and drivers	Contracts	Consumer level
Case study		Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium	Identify CS within the DIVERIMPACTS consortium
1	Case 1	Green	Red	Green	Green	Yellow	Red	Green	Green
2	Case 2	Green	Green	Green	Green	Green	Green	Green	Green
3	Case 3	Green	Green	Green	Green	Green	Green	Green	Green
4	Case 4	Green	Green	Green	Green	Green	Green	Green	Green
5	Case 5	Green	Green	Green	Green	Green	Green	Green	Green
6	Case 6	Green	Green	Green	Green	Green	Green	Green	Green
7	Case 7	Green	Green	Green	Green	Green	Green	Green	Green
8	Case 8	Green	Green	Green	Green	Green	Green	Green	Green
9	Case 9	Green	Green	Green	Green	Green	Green	Green	Green
10	Case 10	Green	Green	Green	Green	Green	Green	Green	Green
11	Case 11	Green	Green	Green	Green	Green	Green	Green	Green



Context-sensitive governance at Case Study level - 1

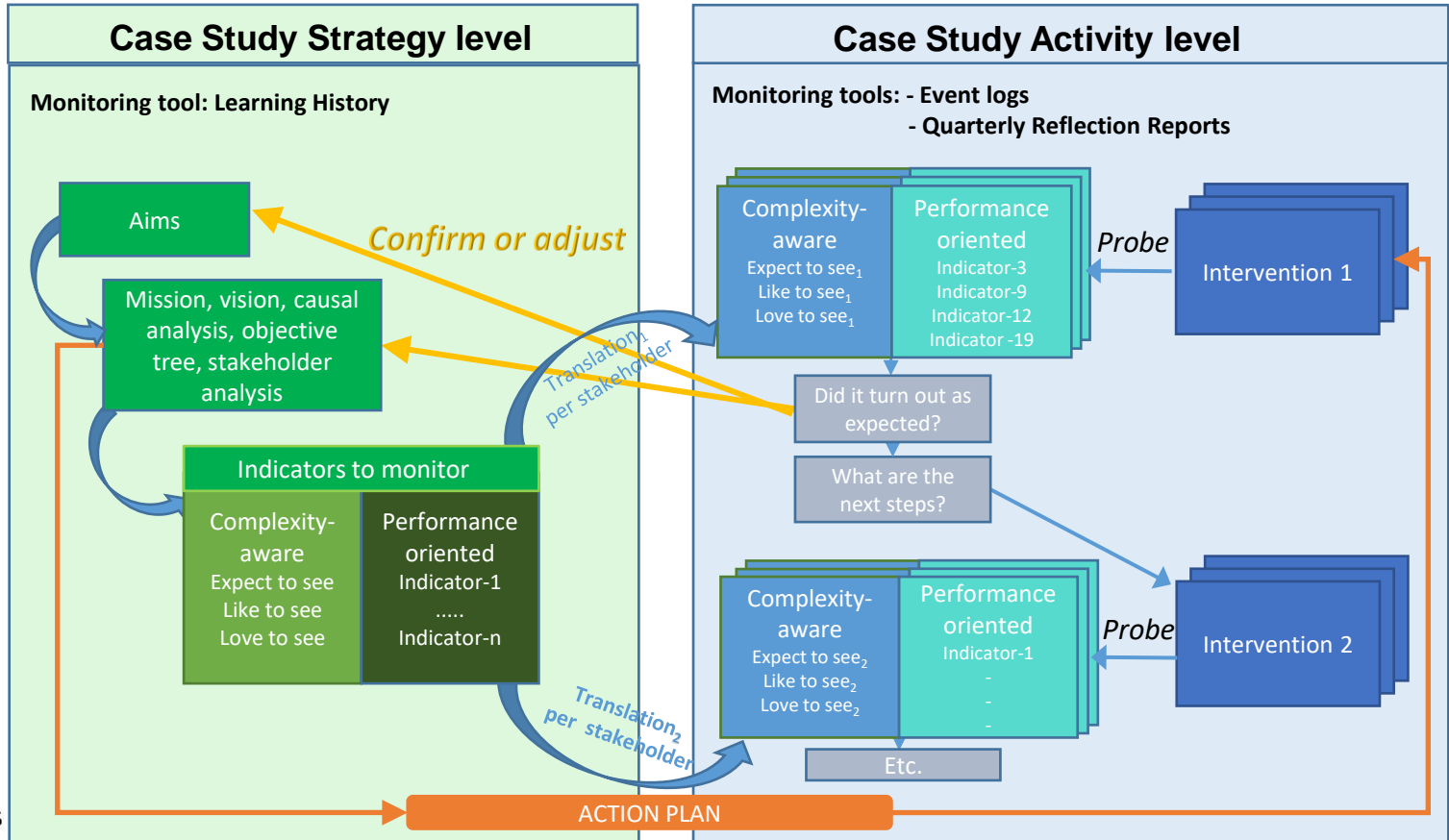
- **Structure**
 - 25 CS teams: leader + monitor
 - 5 Clusters with Cluster Leaders
 - Learning-for-innovation Platform

- **Common way of working**
 - Co-innovation workshops
 - Year 1 to explore vision and mission
 - Action and reflection cycles
 - Early-on think about legacy



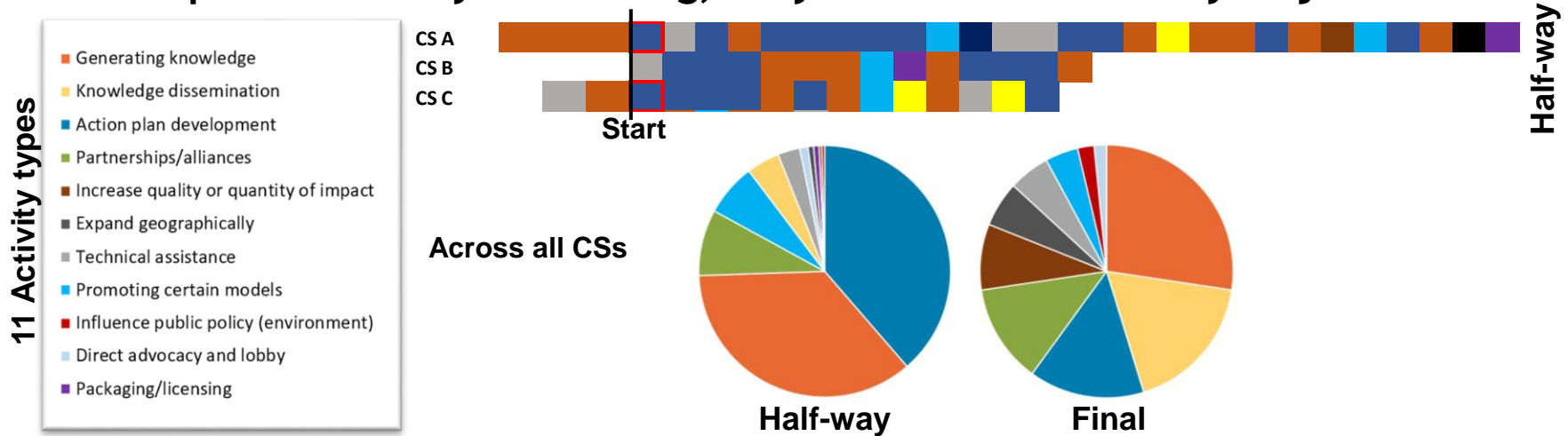
Context-sensitive governance at Case Study level - 2

PIPA
 Outcome mapping
 MCA
 Reflexive monitoring in Action



Insights - 1

- Despite same way of working, very different CS activity trajectories

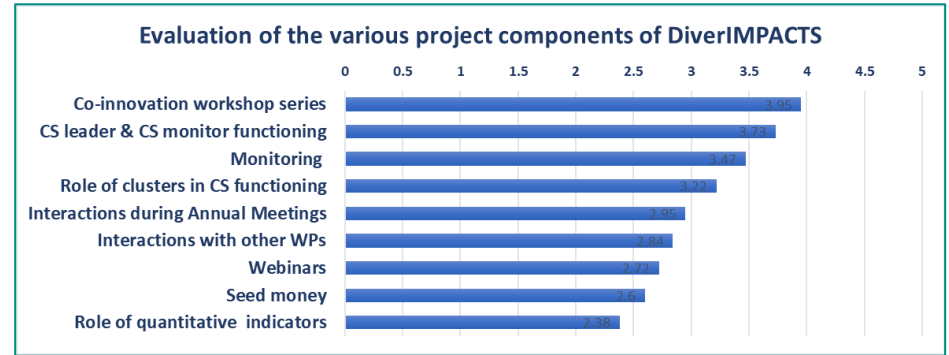


- Differences in CS age, system focus, types of lock-ins, team's experience
- **Assessment methods:**
 - Process indicators relevant throughout: Learning Histories as a useful tool
 - Quantitative indicators increased in relevance as a CS matured

Insights - 2

- **Usefulness of co-innovation components according to CSs**

- Social learning, social capital, empowerment of innovators



- **Change in perceptions on how to do projects**

- Project plans are fixed from the start; change of plan = failure
- Projects are a way to fund business-as-usual: ‘projectivisation’ of organizations

- **Ample opportunity for on-the-fly learning across projects**

- Few new insights from other MAA projects or EC reviews

Conclusions on Producing actionable knowledge

- **R&I projects: underexploited resources for the pressing ‘how-to’ question**
 - Co-innovation as a context-sensitive MAA
- **Three key mechanisms of producing actionable knowledge**
 - Stimulating social learning; empowering actors; building social capital
- **More effective R&I requires changes**
 - In researchers, practitioners and research policy design
- **Evolve ‘multi-actor’ approaches to complexity-aware project governance**
 - Build indicator frameworks for *social learning* at different levels
 - Build science-society alliances *before* the start of a project and secure *legacies*
 - Create more *flexibility* for project managers to respond to emerging developments

Producing Actionable Knowledge for Crop Diversification

Walter Reising, Luca Colombo, Barbara Kuster, Antoine Hesran

- Actionable knowledge is context-specific; knowledge that assists actors in their decision-making to be better positioned to achieve their goals.
- Producing actionable knowledge with Multi-Actor Approaches requires more than gathering ‘multi-actor actors’ around the table. It requires attention for the settings and processes that stimulate social learning, empower actors, and build social capital leading to consensus for action.
- Effective actionable knowledge production is based on mutual understanding, trust, and a common vision of the future. It requires a context-sensitive project governance approach that is more adaptive, learning-oriented, and transparent governance approaches replacing the accountability-focused schemes currently in place.
- More experimentation with innovation-sensitive funding instruments is needed to better understand how to effectively cover public scientific and practitioner knowledge and address pressing global issues.

Introduction

Given that the majority of agricultural research funding is spent through projects, projects need to move beyond generic knowledge production and address a key question: how to produce, contextualize and use knowledge that supports the diversification of European cropping systems to promote agroecological transitions. The Multi-Actor Approach, which has been mandatory for certain categories of European research and innovation (RI) projects since 2014, aims to address this question. However, the approach meets with considerable lack-lust in science, society, and the EC's own funding regulations, which hinder the full potential of research to support the transformation away from unsustainable systems and practices.¹⁾

Drawing on DiverIMPACTS' experiences and analytical results, this policy brief highlights lessons for scientists and practitioners considering getting involved in actionable knowledge-oriented RI projects funded by the EC, and for policy makers involved in designing the calls for projects with a Multi-Actor Approach or for the second Agri-ecology Living Lab and Research Infrastructures Research and Innovation Initiative. All need to rethink their perspectives and practices to enhance the efficacy of joint production of actionable knowledge.

DiverIMPACTS policy brief: Producing Actionable Knowledge for Crop Diversification

Questions to you

Differences with your approaches?

How to analyze process without focusing on one tool?

How to move from ‘niche’ level to ‘regime’?

Thank you for your interest

Change is prepared in everyday conversations

