

Activating  
agricultural  
transitions  
to sustainability  
**through  
participatory  
research and  
co-innovation**

Stories of  
change across  
Africa, Asia and  
Latin America  
from the DeSIRA  
initiative





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## TABLE OF CONTENTS

	<b>PREFACE: Stories of Change</b> to capture innovation journeys and invisible transformative changes	<b>6</b>
	<b>INTRODUCTION: Agricultural research</b> for innovation and transitions	<b>8</b>
<b>1</b>	<b>PART 1: From transfer to co-innovation:</b> new frontiers between researchers and farmers <b>The challenges of co-innovation</b>	<b>10</b>
	<b>STORY 1:</b> Learning together: Farmers as active researchers, and researchers active listeners. <i>Fair Sahel project, Senegal</i>	14
	<b>STORY 2:</b> Nurturing forgotten crops, a journey towards resilient agriculture. <i>SUSTLIVES project, Burkina Faso and Niger</i>	18
	<b>STORY 3:</b> The resilient journey of livestock transformation. <i>LIPS-Zim project, Zimbabwe</i>	22
	<b>STORY 4:</b> Sowing innovation among smallholders for Climate-Smart Agriculture. <i>Climate-smart innovations project, Malawi</i>	26
<b>2</b>	<b>PART 2: Research co-innovating</b> with private sector, civil society and policy makers <b>The challenges of inter-organisational partnerships</b>	<b>32</b>
	<b>STORY 5:</b> Agricultural Innovation Lab: cultivating a greener future. <i>TRANSFORMA-INNOVA project, Costa Rica</i>	36
	<b>STORY 6:</b> Sustainable land management and native açazais in the Marajó region of Pará. <i>Sustenta e Inova project, Brazil</i>	40
	<b>STORY 7:</b> From Transactional to transformative Partnerships. <i>GRAPE project, Nepal</i>	44
	<b>STORY 8:</b> An innovative financial model for equipping farmers with small irrigation systems. <i>IRRINN project, Burkina Faso</i>	47
<b>3</b>	<b>PART 3: Facing tensions and dilemmas</b> through multi-stakeholder collaboration <b>The challenges of collective solutions to collective problems</b>	<b>52</b>
	<b>STORY 9:</b> Growing opportunities, the impact of The Bawan Rural Resource Center (RRC). <i>ReSI-NoC project, Cameroon</i>	56
	<b>STORY 10:</b> Unleashing alliances for resilient farmers in Forest Coffee Ecosystems. <i>Yayu Coffee project, Ethiopia</i>	59
	<b>STORY 11:</b> Elevating Livestock Health through Innovative Multi-Stakeholder Collaboration. <i>LIDISKI project, Nigeria</i>	63
	<b>STORY 12:</b> Flavors of jungle and sea. <i>ABRIGUE project, Colombia</i>	67
	<b>Conclusion</b>	<b>72</b>
	<b>References</b>	<b>74</b>
	<b>Colophon</b>	<b>76</b>

## From innovation piloting to innovation support: new frontiers between researchers and farmers

by Aurélie Toillier

### The challenges of co-innovation

Co-innovation is a process in which researchers work together with stakeholders to realise innovations of different kinds, such as combined technological and institutional innovation (Bossink, 2002; Dogliotti et al., 2014; Klerkx et al., 2017). Co-innovation goes beyond participatory and transdisciplinary research in the form of doing joint experiments, given that it is aimed at supporting broader changes in farming systems, sectors, territories and value chains. Co-innovation is about collaboration, knowledge exchange, capacity development, convergence and co-creation of ideas (Lee et al., 2012). The co-innovation approach involves iterative testing with the end users of the innovation, in which capacity development of all the involved actors is a key success factor of the process.

Several co-innovation experiences reported in the literature have demonstrated limited contributions of participants, the end user's unwillingness to share ideas, or impracticality of some ideas suggested (Toillier et al., 2019). Therefore, upgrading capacities for co-innovation is becoming an intrinsic feature of co-innovation approaches. These capacities are of a different nature, ranging from technical to functional, organisational and managerial capacities to enable coordination, resource mobilisation, experimentation, co-creation, negotiation, facilitation or conflict management. These capacities are needed at several levels where the collaborative work is implemented (individual, organisation, community, project) and concern different types of actors depending on the innovation developed (farmers, farmer organisations, researchers, extension workers, service providers, etc.).

Ultimately, upgraded capacities for co-innovation create improved environments conducive to successful innovations for transitions.

R&I projects are recognized as one of the vehicles that can help to develop such capacities across multiple levels in AIS, from the individual to the network, to mobilize and build systemic innovation capacity (Turner et al., 2017).

The co-innovation approach has been extensively used in the DeSIRA projects as an approach to tackle issues in agriculture and natural resource management through the mobilization of resources and capacities within national agricultural innovation systems. Being at the forefront of promoting these approaches, sometimes quite new in their contexts, researchers were in charge of both designing and implementing the approach, and ensuring capacity development at the level of the project and the partnering organisations in order to improve its outcomes.

This first chapter presents a variety of co-innovation approaches and illustrates the multiple contextual factors that can influence how they work. These include: the types of expected innovation outputs (technological or organisational), the degree of novelty brought into the specific context of each country, the expectations of partners, and the (more or less central) roles assumed by researchers in the innovation partnership. In other words, this first chapter gives a first glimpse into what it takes for research to shift from the traditional well-known linear transfer of technology approach, towards the iterative co-innovation journey; one that blurs the boundaries between research activities and innovation activities through collaborative exploratory approaches. The former organises the involvement of each actor in a simple sequenced pathway around technology development and adoption, whereas in the latter knowledge exchange

between researchers and other actors and joint learning through iterative non-linear cycles are central.

The four stories reveal typical challenges faced by DeSIRA projects in putting in place co-innovation approaches, such as shifting researchers' roles and capacities (Fair Sahel and SUSTLIVES projects), guiding experimentation (LIPS-Zim project), managing joint learning cycles (SUSTLIVES project), engaging farmers as co-innovators (LIPS-Zim and SUSTLIVES projects) and upgrading partnership capacities for enabling co-innovation (Climate-smart Malawi project).

### What have we learnt?

#### • Significant investments were made in new capacities

Co-innovation requires new roles for researchers who may support these processes in different ways: as explorers, experts, facilitators of interactions, designers of solutions and products, trainers, or by monitoring processes and supporting reflection (Wittmayer and Schöpke, 2014; Toillier et al., 2018).

The roles endorsed by researchers may depend on the innovation phases (ideation, prototyping, scaling), on the depth of technical challenges (more or less radical) and on the breadth of stakeholder engagement (more or less extensive). The innovation phase for many projects included a significant investment in developing new capacities to enable researchers to take on new roles.

At the early phase of an innovation project, researchers can play several roles: initiator, designer, project formulator, mobiliser of partners, and conductor of systemic reviews and baseline assessments to position the scope of innovation (LIPS-Zim project). When the time comes to implement iterative experimentation and joint learning, researchers can wear the hat of innovation facilitators and engage in the design and facilitation of multistakeholder innovation platforms (Climate-smart Malawi project). Alternatively, or additionally, they can become an active part of the experimentation process by conducting evaluations of the new technologies under development, and/or joining action-research and knowledge co-production for the use of technology developers. At a later stage in the innovation process, when scaling readiness is there, researchers can help with expertise in different domains in order to validate or shape the financial (IRRINN project), legal, organisational (SUSTENTA e INOVA project, LIDISKI project) and policy (ABRIGUE project) conditions for scaling and sustainability in a broader context.

The way these different types of research contributions are packaged, coordinated and strategically managed by research organisations all along the innovation trajectory defines the different research and innovation models. We identified two distinct models: the “innovation-through-research” model and the “research-in-innovation” model.

In the “innovation-through-research” model, the researcher is in a piloting position for the overall innovation process: the researcher develops the innovation agenda and strategy, and actively engages innovation end users in dedicated experimentation and coordination mechanisms. In general, researchers also play the role of trainers in order to upgrade end-user capacities to engage in such a process and on a very new innovation agenda from their perspective. This is exemplified by two stories: the SUSTLIVES project in the Sahel and the Climate-smart project in Malawi. In these two cases, researchers brought packages of new technologies or new crops, as potential solutions to well-known problems, and piloted their experimentation, making use of participatory approaches. The stories showcase the effort developed by research to ensure buy-in and commitment of farmer communities.

In the “research-in-innovation” model, researchers are called upon to support ongoing innovation process and develop a research agenda based on innovators’ needs. This requires researchers to be equipped with new types of tools to guide experimentation led by farmers in ways to ensure scientific results and evidence-based solutions. This is illustrated by two stories, from the Fair Sahel project in Senegal and the LIPS-Zim project in Zimbabwe. In the first one, researchers were equipped with an “ideotyping” tool, serving as a compass to support the exploration journey by a farmer setting up an agroecological farming system. In the second one, researchers developed the “Feed Assessment Tool” to help breeders identify suitable forage and complementary feed ingredients for improving livestock practices. In both cases, farmers were innovators (they also monitored the research agenda and activities during their transformative journey) and the researchers were part of this joint discovery process. Farmers were also invited to participate in coordination and joint learning mechanisms at upper levels, which were put in place by local authorities (such as Ndiop commune in FAIR Sahel project), NGOs or other civil society organisations in charge of mainstreaming the innovation agenda and the transformative vision of agrifood systems.

Embedding these new roles was not always easy, as it challenged skillsets, identities and role perceptions by researchers, as is well illustrated in the stories of Fair Sahel and Climate-smart Malawi.

“Beyond technology development, the project also prioritises capacity building initiatives aimed at enhancing the scientific knowledge and technical skills of agricultural researchers and technicians. Training sessions on experimental design, data collection, analysis and reporting empower participants to conduct rigorous research and contribute to evidence-based decision-making.” (Climate Smart Malawi Story of Change)

Crucially, co-innovation also required changes in the roles and capacities on the farmers’ side, to enable a true collaboration.

#### • Engaging farmers as co-innovators enabled them to take on a transformative triple challenge

Innovating for sustainability transitions implies designing new unprecedented farming systems, with a possibly radical transformation of farmers’ practices, ways of reasoning and ways of participating in local knowledge production.

Consequently, farmers face a triple transformative challenge, i.e. in doing, thinking and interacting, which is not always fully acknowledged and supported in co-innovation approaches (Lacombe et al., 2018).

This is what “farmers’ engagement” is all about across the four stories presented in this chapter. They highlight how researchers supported farmers in ways that enabled change in their ways of doing, thinking or interacting. The LIPS-Zim project trained farmers to conduct on-farm trials, the Fair Sahel project emphasised the need for systems thinking by farmers to develop innovative solutions, and the Climate-smart Malawi project supported farmers’ engagement in multi-actor platforms for informed decision-making and collaborative action. Farmers’ capacity development is everywhere, embedded into co-innovation.

“Central to the success of the agricultural innovation platform AIP approach is capacity building, which equips stakeholders with the knowledge and skills necessary to actively participate in technology development and evaluation.” (Climate Smart Malawi Story of Change)

All the stories demonstrate how important co-innovation frameworks and protocols for interaction are to create new contexts enabling for such behavioural changes in knowledge, attitude and practices. Whether innovation platforms (Climate Smart Malawi story of change), participatory technology development approach (LIPS-Zim story of change), co-design approach (Fair Sahel), or stakeholder forum (SUSTLIVES story of change) – all created new work environments that allowed for

new behaviours and thereby new mindsets among researchers, farmers and their other collaborators. Co-innovation frameworks are meant to change work environments and collaboration rules, which are starting points for behavioural change toward new ways of doing, thinking and interacting to address complex sustainability problems. Farmers’ engagement is one of the key contributing factors (Ingram et al., 2020). Hence all the details of engagement processes are important and part of the Stories of Change told by the projects. The starting points might differ, but in all the SoCs researchers engaged with farmers through tailored interactive learning loops. In the LIPS-Zim project, a problem-solving approach was used, defining the research and innovation agenda as a first step. As a second step, participatory on-farm technology development was used to identify new suitable forage and complementary feed ingredients for goat, sheep and cattle production. In the Climate-smart Malawi project, an opportunity-based approach was adopted, starting with a package of new climate-smart technologies that had to be adapted to local conditions and responsive to farmers’ needs. The SUSTLIVES project, which aimed to introduce new species in farming systems for improving nutrition, started from another angle: by co-identifying with many actors the potential at local level for the introduction of the new species, and then doing action-research and participatory varietal selection to support pioneering producers of neglected and underutilised species in real conditions.

In order to effectively change behaviour, it is crucial to consider the target group’s circumstances and develop strategies in association with them.

#### • Capacities and time are two scarce resources

The focus on researchers’ and farmers’ capacity development outcomes is the very added value of these stories, compared to academic publications resulting from R&I projects. Such changes are rarely reported by researchers who focus their publications only on the new

knowledge produced and innovation outputs (Lacombe et al., 2018).

Capacity outcomes are the foundation for the sustainability of the changes once the projects are over. For future replication, it is crucial to understand both the nature of the capacities to be developed and the ways of developing them in real time, while innovating. The stories highlight diverse types of required capacities for both researchers and farmers, i.e. technical, functional and managerial capacities. They also make us understand the non-linear and unique journey that each project team had to take to practice co-innovation, thus showing co-innovation as an “art” rather than a “science” where practitioners’ testimonies explain the fundamentals to succeed in each context (Jones, 2018). Such stories can help generate new knowledge, not only on the innovation products themselves, but also on the underlying assumptions and strategies in co-innovation projects for generating changes; this remains an insufficiently explored area in agricultural sciences until now.

The stories also help to understand why co-innovation takes time. In the four cases, the project model allowed for emergent participatory research designs in dynamic innovation processes, but it took them several years before the first innovation outputs appeared. It raises questions about the capacities of implementing organisations to sustain their co-innovation approaches beyond project duration, in order to go beyond the first experiments and engage more actors in the process. Co-innovation requires changes among multiple actors at different levels in agricultural innovation systems to embed these approaches (Nettle et al., 2013; Schut et al., 2016).

The next chapter explores how DeSIRA projects involved other stakeholders in the system to be transformed (private sector, civil society, policy actors) as co-designers, beyond farmers.

#### STORY 1:

Learning together: Farmers as active researchers, and researchers as active listeners

*Fair Sahel project, Senegal*

#### STORY 2:

Nurturing forgotten crops, a journey towards resilient agriculture

*SUSTLIVES project, Burkina Faso and Niger*

#### STORY 3:

The resilient journey of livestock transformation

*LIPS-Zim project, Zimbabwe*

#### STORY 4:

Sowing innovation among smallholders for climate smart agriculture

*Climate-smart innovations project, Malawi*