



A young Borana woman with her goats Borana, Ethiopia  
Photo: ILRI/Zerihun Sewunet



RESEARCH  
PROGRAM ON  
Livestock

# LIVESTOCK RESEARCH FOR DEVELOPMENT: LESSONS LEARNED ON INTEGRATION FROM THE CGIAR RESEARCH PROGRAM ON LIVESTOCK AGRI-FOOD SYSTEMS

## AUTHORS

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Froukje Kruijsen, Mona Dhamankar, Boudy van Schagen, and Helena Posthumus

KIT Royal Tropical Institute





CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. The CGIAR Research Program on Livestock provides research-based solutions to help smallholder farmers, pastoralists and agro-pastoralists transition to sustainable, resilient livelihoods and to productive enterprises that will help feed future generations. It aims to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk and eggs more available and affordable across the developing world.

The Program thanks all donors and organizations who globally supported its work through their contributions to the CGIAR Trust Fund.

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Photo Livestock Vietnam Ltd./Chi Nguyen

# INTRODUCTION

*Livestock grazing, Vietnam*

The CGIAR Research Program on Livestock (Livestock CRP for short) provided research-based solutions to help smallholder farmers, pastoralists, and agro-pastoralists transition to sustainable and resilient livelihoods, and to profitable enterprises that will help feed future generations. The aim of the program was to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk, and eggs more available and affordable across low-and middle-income countries.<sup>1</sup>

From 2017 until 2021, a ‘priority country program’ was set up in Ethiopia, Tanzania, Uganda, and Vietnam. These projects built on work started by the CRP on Livestock and Fish, which ran from 2012 to 2016. In both research programs, an important component of the research agenda was to deliver impact through livestock research. Starting in 2019, a more concerted investment was made to package the research outputs and pilot an integrated livestock development intervention in each country that could take the research outputs to scale. A key notion was to ‘accelerate’ research to outcomes and impact by transforming the entire value chain, working with development partners from the start. This was done by building on ‘best-bet interventions’ already identified, involving all flagships, and establishing in-country project leadership and coordination.

International agricultural research traditionally tends to focus on technical improvements to crops and livestock, such as genetic selection and breeding, management of (animal and crop) diseases, and soil fertility and animal feeds. Although this research has created a wealth of knowledge, and achieved impressive productivity gains, for example, through new crop varieties, it is also criticised for leaving some behind in terms of development impact.

There is now an increasing acknowledgment of the complexity and multi-dimensional nature of rural poverty and the interactions with the environmental and socio-

economic context (van Noordwijk, 2019). This resulted in greater recognition of the need for integrative approaches to research across disciplines, sectors, geographical scales, and styles of knowledge creation (van Kerkhoff, 2014). However, implementing this has been challenging in the CGIAR research programs, and it has therefore been recommended that, ‘collaborative piloting and systemic evaluation of combined technical and socio-institutional options’ becomes part of the CGIAR research programs, and that investment is made in new methodologies to do so (Leeuwis and Wigboldus, 2017).

The Livestock CRP priority country program was an example of such a collaborative attempt to pilot packages of technologies that could be taken to scale to solve complex problems related to animal productivity, animal health, value chain development and food safety. Specifically, the aim was to bundle the ‘best-bet’ research results of those different research areas into ‘integrated packages’ that have the potential to be scaled and delivered with partners in livestock value chains. This involved all the program’s research themes (called flagships) and cross-cutting themes, using consistent approaches and tools, including project-level theories of change, and with specific support for integration, partnerships, capacity development, scaling, policy engagement, learning and communications. This document presents the lessons learned on the process of integration during the implementation of these priority country projects.



Photo ILRI/Steve Mann

*A local farmer and her cattle in Son La Province, Northwest Vietnam*

1. Proposal Livestock Agri-Food Systems CGIAR Research Program. <https://hdl.handle.net/10947/4398>, accessed on 06/12/2021.  
2. Outputs and products of the country-based research are accessible at <https://cgspace.cgiar.org/handle/10568/80752>

## LIVESTOCK RESEARCH FOR DEVELOPMENT

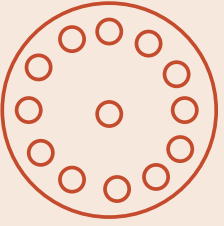
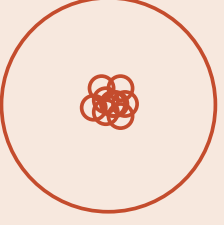
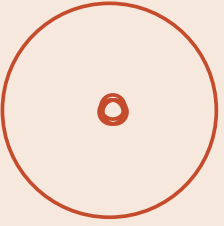
Research for development typically takes place in complex environments with multiple influencing factors and partners, and non-linear processes (Tomich *et al.* 2019). This means a multi-faceted approach to research for development is required to tackle the complexity of the problems. To achieve impact, not only the development of socio-technical innovation bundles are essential; they need to be accompanied by essential supporting policies, institutions and social processes (Barrett *et al.*, 2020). The CRP priority country program aimed to develop socio-technical innovation bundles (known as integrated intervention packages in the CRP Livestock), involving research, practitioners and the private sector, to bring about change in value chains at scale for the benefit of smallholder farmers. This required not only collaboration between scientific disciplines, but also between researchers and stakeholders involved in the agri-food system. An integrated livestock research for development approach thus requires the skills of researchers to put their disciplines into dynamic systems contexts and to incorporate the contributions of different disciplines, as well as skills in partnerships

development and change management with multiple stakeholders in the agricultural sector and wider society (Kaufmann, 2007). The concept of 'integration' (of innovations, skills, disciplines and stakeholder interests) is, thus, an important component of livestock research for development.

For this document, we choose not to provide a strict definition of integration, as it was observed that the concept means different things for different stakeholders. In the context of the priority country projects, it revolves mainly around the packaging of interventions (the best-bets) that were outputs of different research themes, and jointly evaluating how together these interventions contribute to the project impact goals.

We have conceptualized different 'levels' of integration for the country projects, namely aggregation, harmonization, and integration, and this has been linked with distinct levels of academic inter-disciplinarity i.e., multi-, inter- and trans-disciplinarity (**Table 1**). These are not mutually exclusive categories, but a continuum, as aggregation and harmonization are needed to achieve integration.

**Table 1.** Understanding of different levels of integration

Indicator	Level of integration in country projects	Level of academic interdisciplinarity
	<b>Aggregation:</b> <ul style="list-style-type: none"> <li>• Different flagship research activities and technologies/innovations are tested, assessed, and disseminated in the same intervention area and with the same target communities, but limited joint activities.</li> <li>• No integrated research question.</li> </ul>	<b>Multi-disciplinarity:</b> <ul style="list-style-type: none"> <li>• Multiple disciplines working separately in the same place on the same problem to reach greater understanding.</li> <li>• Contrasts disciplinary perspectives in an additive manner; limited interaction between disciplines.</li> </ul>
	<b>Harmonisation:</b> <ul style="list-style-type: none"> <li>• Research activities are jointly designed, planned, and implemented aligned to seasonal husbandry activities.</li> <li>• Disseminated technologies/innovations are not conflicting – they are complementary.</li> </ul>	<b>Inter-disciplinarity:</b> <ul style="list-style-type: none"> <li>• Multiple disciplines working together seeking complementarity in the same place on the same problem to reach understanding.</li> <li>• Visible/measurable evidence of integrated research outputs.</li> </ul>
	<b>Integration:</b> <ul style="list-style-type: none"> <li>• Research activities are integrated and in line with production calendar.</li> <li>• Technologies/innovations are combined to foster synergies/positive interaction effects (whole &gt; sum of parts).</li> <li>• Planning of activities and selection of technologies is done jointly with partners and communities.</li> <li>• Multi-stakeholder platforms for co-creation of solutions.</li> </ul>	<b>Trans-disciplinarity:</b> <ul style="list-style-type: none"> <li>• Multiple disciplines working synergistically to arrive at sustainable solutions.</li> <li>• Creates higher level frameworks that transcend disciplines.</li> <li>• Outcome oriented instead of output oriented.</li> <li>• Social learning for practical solutions.</li> </ul>



## PROCESSES OF LESSONS LEARNING AND REFLECTION

The lessons learned presented in this document have been generated through processes of joint reflection at different points during project implementation. These focused on documentation of the tacit knowledge of the CGIAR scientists and key partners of the priority country projects. Several tools were used for the reflection (see **Figure 1**):

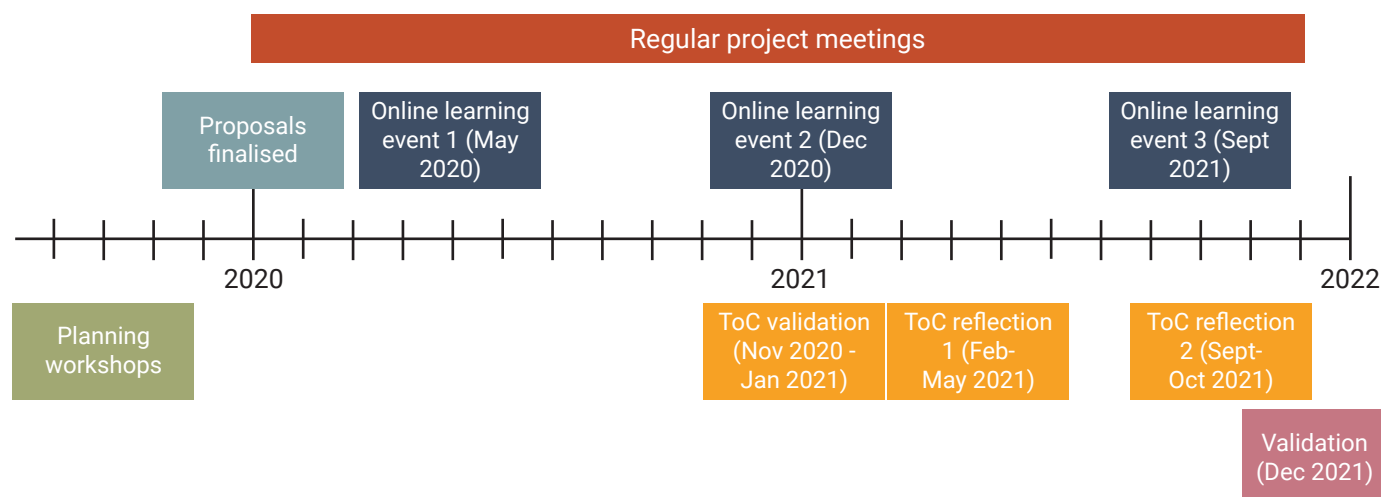
1. **Initial country-level planning and design meetings** where the projects' research questions were formulated and the Theories of Change were decided on with partners.
2. **Monthly country-level project meetings** where updates were shared among partners on general and flagship specific project activities.
3. **Virtual learning weeks:** this was a light approach to periodically harvest insights and lessons learned from a large group of professionals around specific questions or topics. Three virtual learning weeks, organized in May and December 2020 and September 2021, using MS Teams as a platform with light facilitation by a small group of moderators who were responsible for summarizing the information shared per country program.
4. **Online Sprockler surveys:** the Sprockler platform was used to collect stories from key informants (CGIAR program staff and partners) on the topic of integration. Sprockler comprises a method to capture personal accounts of change or lessons learned and enables the digitization of these stories through an online survey tool. It enables the collection and interpretation of people's opinions into a narrative about change, contribution, relations, and impact. Qualitative data are quantified for pattern recognition in people's stories. The focus of Sprockler is self-

signification, placing the respondents at the core of the analysis process. The analyser and visualizer modules of Sprockler functionally and interactively display and share the results. The key question being asked was: "Related to the CRP Livestock priority country program(s), please share a story about a positive or negative experience with integration, i.e., a collaboration or activity with other teams or partners (or lack thereof). Your story can be related to research activities, the integrated intervention package, project management, multi-stakeholder collaboration or the implementation of the project/intervention on the ground."

5. **Theory of Change reflection sessions:** two online sessions were organised in each country to reflect on the progress of the country projects' Theories of Change (ToCs), using an updated and validated ToC. These included research teams and partners.
6. **A validation workshop:** this workshop, held in December 2021, gathered key people from the country projects to reflect on the findings presented, and finalize this document.

In the remainder of this document, we present the main lessons learned on livestock research for development generated through this process. The document starts with a short description of the priority country projects, and then presents the main lessons learned around the benefits and challenges of integration, and on how to achieve integration in livestock research for development. The document is not a 'best practice' guide, but provides the lessons learned in course of the project that can support others who aim to do the same.

**Figure 1.** Timeline of lesson-learning activities



## PRIORITY COUNTRY PROJECTS

*Buffalo in Tan Lac district, Vietnam*

The priority country projects took place in four countries Ethiopia, Tanzania, Uganda and Vietnam. Each country had a different focus, with regard to the target species or system and the ultimate goal of the project (**Table 2**).

A ToC approach was used to develop country plans. The main aim was to translate livestock research into integrated transformative pilot interventions that can eventually be scaled up to achieve impact at scale. The research outputs (also called 'best-bets') are technologies, processes, institutional or social innovations that have been chosen through a rigorous, participatory, transparent, and evidence-based selection process because of their potential to make a positive contribution to one or more development

outcomes (Baltenweck et al., 2019). These interventions were tested, monitored, and evaluated against five dimensions (economic sustainability, gender and social equity, environmental sustainability, social acceptability, and political acceptability) in the earlier stages of the Livestock (and Fish) CRP, usually through research activities implemented by scientists of one of the key themes. The intention of the priority country projects was to package these tested interventions into coherent bundles, suitable for scaling. These integrated packages essentially consist of three elements: i) contextually relevant/suitable technical products or innovations, ii) a set of institutional and/or delivery mechanisms, and iii) activities to build capacities of value chain actors and/or local partners to take up and deliver the packages.

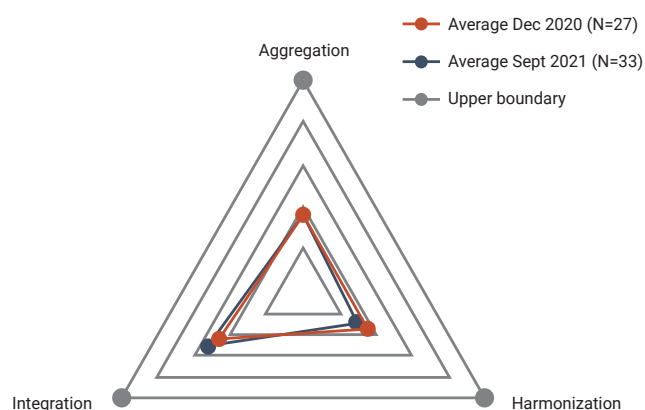
**Table 2.** Overview of priority country projects, focus, sites and target groups

Country (project name)	Target species/ system	Ultimate goal	Target ('next') users	Sites
Ethiopia (SmaRT Ethiopia)	Small ruminants (SR)	<ol style="list-style-type: none"> <li>1. Increased income for SR producers</li> <li>2. Functional community and district level platforms make public and private services and input supplies available to SR producers</li> <li>3. SmaRT pack becomes part of government's development strategy.</li> </ol>	<ul style="list-style-type: none"> <li>• Small ruminant producers</li> <li>• Youth groups</li> <li>• Veterinarians and Development agents</li> <li>• Policymakers</li> </ul>	Abergelle Bonga Doyogena Menz
Tanzania (Maziwa Zaidi)	Dairy cattle	Investors promote and/or support dairy agribusinesses and catalyse inclusive and sustainable development of the dairy value chain benefiting all value chain actors.	<ul style="list-style-type: none"> <li>• Agripreneurs</li> <li>• Dairy producers</li> <li>• Policymakers</li> </ul>	Tanga Kilimanjaro
Uganda (MorePork II)	Pigs	To improve incomes of pig value chain actors through marketing arrangements and sustainable integrated technology package in Uganda.	<ul style="list-style-type: none"> <li>• Feed producers</li> <li>• Aggregators</li> <li>• Pig producers</li> <li>• Policymakers</li> </ul>	Masaka and Mukono districts
Vietnam (Li-chan)	Crop-livestock systems	<p>Farmers in Mai Son, specifically ethnic minorities, men and women at the three levels (lowlands, midlands, highlands):</p> <ol style="list-style-type: none"> <li>1. Have sustainably intensified crop-livestock smallholder systems</li> <li>2. Have commercialized livestock smallholder production</li> <li>3. Are going towards enabling policy for sustainable livestock intensification.</li> </ol>	<ul style="list-style-type: none"> <li>• Livestock farmers</li> <li>• Vets &amp; extension workers</li> <li>• Policymakers</li> </ul>	Mai Son district, Son La province

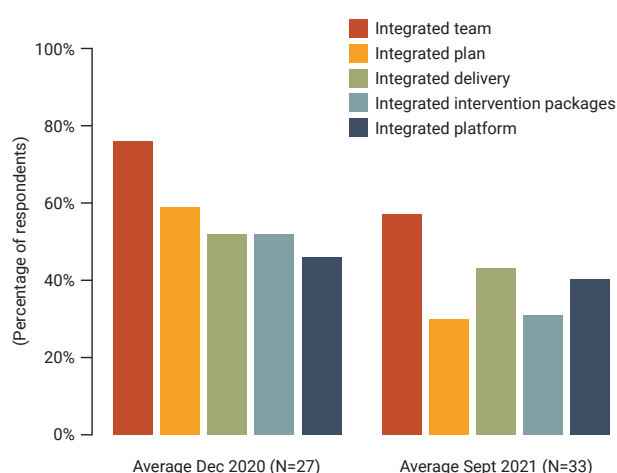
Source: Authors' compilation based on project proposals.

# SPROCKLER SURVEY RESULTS

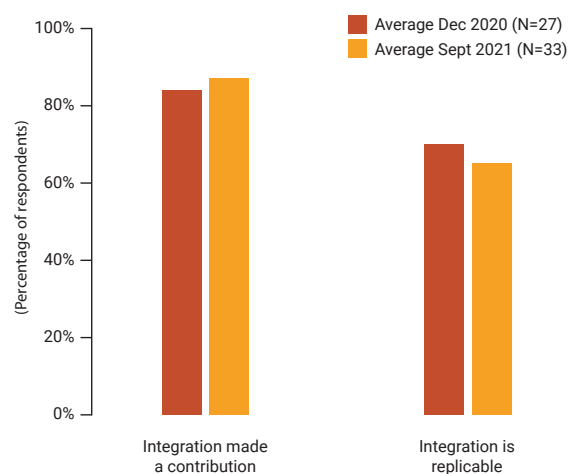
**Figure 2.** Average scores of Sprockler surveys 2020 and 2021 on level of integration



**Figure 3.** Types of integration



**Figure 4.** Contribution and reproducibility



Source: Sprockler surveys December 2020 and September 2021.

The stories collected in the Sprockler surveys, were self-classified by respondents with regard to the type and level of integration it represented. Respondents perceived that their stories were most about integration, closely followed by aggregation and harmonization (**Figure 2**).

Stories shared concerned:

- Examples of collaboration between flagships (themes) to jointly plan and conduct activities (e.g., field visits, training, workshops or surveys)
- Interdisciplinary research involving multiple flagships,
- Collaboration with national partners for project implementation
- Collaboration with value chain actors to deliver integrated packages to farmers
- Benefits of integrated intervention packages for farmers.

The stories of integration were, according to respondents' self-classification, in both surveys most about working in integrated teams (**Figure 3**). A shift was visible between the two surveys in the order of importance of the types. In the first survey, the second most important theme of the stories was integrated plans, the third integrated delivery, the fourth integrated packages, and stories were least about integrated platforms. In the second survey, the second most common type of integration was integrated delivery, and the third integrated platforms, while the least common type was integrated plans, showing a shift away from the project design and management side of integration towards integrated delivery. In that sense it is surprising that the level of integration did not see a shift from aggregation and harmonisation towards more integration. Reflecting on the stories shared, most stories described operational experiences and outputs more consistent with aggregation and harmonisation. There were few reflections on the outcomes achieved through the priority country projects, which can be partly explained by the relative short implementation period of the current phase. Yet, overwhelmingly integration was felt to have made a positive contribution, and to a lesser extent to be replicable (**Figure 4**).



## BENEFITS AND CHALLENGES

*Sintayehu Bashahyder feeds his sheep, Ethiopia*

### BENEFITS OF INTEGRATION

Integrative approaches, where research takes place across disciplines, sectors, geographical scales, and styles of knowledge creation, are perceived to have a higher likelihood of achieving development impacts by addressing the complex and multi-dimensional nature of rural poverty and the interactions with the environmental and socio-economic context (van Noordwijk, 2019). Whether or not this was the case with CRP livestock is analysed in more depth in a separate output document (see Dhamankar, 2021a; 2021b, Kruijssen, 2021, and van Schagen, 2021 for an analysis of the outcomes of each priority country project, and Kruijssen et al., 2021 for a synthesis).

CGIAR scientists and partners involved in the country projects observed that the integrated approach (with the integrated packages) has several benefits. At the level of the direct implementation of activities with stakeholders, it provides clarity among the users of research, both for next users (e.g., extension agents, entrepreneurs) and end-users (livestock producers), because there is one team offering a coherent set of interventions, rather than different thematic teams of scientists offering different activities without coordination. At the same time, this approach raises the awareness among livestock producers and local partners of the need to use a holistic approach to livestock production to achieve positive results, as it demonstrates the relation between the different technologies/innovations/components. The more diverse nature of the interventions also raises interest among a wider set of (potential) partners.

Integration also provides opportunities for increased efficiency in the use of project resources, as knowledge and skills developed for the use of one technology can also be used for the adoption of others. Importantly, integration has the potential for teams of researchers to address complex challenges in livestock value chains by exchanging findings and ideas with other disciplinary areas and the opportunity to capitalise on individual strands of earlier livestock research.

At the outcome level, because all technologies/interventions work towards the same end goal, there is a higher likelihood of achieving these goals. Linking interventions increases the likelihood and speed of adoption of technologies (e.g., breed improvement and improved feeding and health management interventions). As certain interventions may take longer to achieve results, early successes of other interventions may also increase adoption and long-term sustainability. Long-term sustainability also depends on ensuring the technologies are part of viable business models for input and service providers in livestock value chains. Creating demand for a diversity of inputs and services increases the likelihood of such business models being profitable.

### TANZANIA: BUNDLING OF SERVICES AND PRODUCTS MORE PROFITABLE THAN SINGLE INTERVENTIONS

According to an analysis of agripreneurs in the boot camps, the cost of operation and gross margin was higher for AI services offered with bundled services such as pregnancy testing, the sale of mineral mixture, deworming, commission-based mobilisation of farmers for ECF vaccination.

### CHALLENGES OF INTEGRATION

Despite these potential benefits of integration of research outputs, a number of challenges have so far limited widespread adoption of the approach in agricultural and livestock research for development. Livestock CRP researchers and partners observed these challenges in six key areas: transaction costs, capacity for integration, funding structures, internal incentives, external barriers, and research quality (**Table 3**).

**Table 3.** Challenges of integrating research outputs

Area	Issues
Transaction costs	<ul style="list-style-type: none"> <li>• Trade-off between synergetic benefits and (perceived) transaction costs (e.g., coordination to synchronise activities, time to understand other research components). Tendency is to fall back to the disciplinary comfort zones where researchers feel they can be more effective.</li> <li>• Different research teams as well as intervention packages have to wait for each other.</li> <li>• Integration requires increased face-to-face interaction for learning and engaging with local stakeholders, which requires time, resources, and people with the right skills and networks.</li> </ul>
Capacity for integration	<ul style="list-style-type: none"> <li>• Limited capacity for 'systems' research, understanding of research of other disciplines, social learning, and working in different types of partnerships.</li> <li>• Lack of activities to link up research.</li> <li>• Lack of research or focus on the effects of an interrelated interactions of the themes/disciplines.</li> </ul>
Funding structures	<ul style="list-style-type: none"> <li>• The timeframe of projects is often short which means that large ambitions of integrated outcomes are not realistic. Single discipline research may be easier to break down into smaller components.</li> <li>• Existing structures and funding mechanisms within the CGIAR, and the limited scope of funding calls limit the flexibility of the projects and can form a hindrance to integration.</li> <li>• Dedicated resources required to facilitate an integrated approach (time, staff, funding).</li> </ul>
Internal incentives	<ul style="list-style-type: none"> <li>• Integrated projects require more time input of researchers, the effort required is not appreciated in regular performance indicators and reviews against which researchers are held accountable.</li> <li>• Performance metrics for researchers are often based on peer-reviewed publications and there are fewer journals that accept articles about delivery and integration processes, which drives a focus on own publications before joint ones.</li> </ul>
External barriers (partners)	<ul style="list-style-type: none"> <li>• It is easier to create enabling conditions for single interventions than for a package because many different actors need to get involved, and policies coming from different directorates could be limiting.</li> <li>• Institutional disaggregation of government partners (i.e., separate government offices for different topics/sub-sectors) and bureaucratic processes hamper collaboration and cross-sectoral support.</li> <li>• Partners are often bound by the short timeframes of projects, and an inability therefore to engage in the long-term.</li> <li>• Diverse partners also have diverging priorities, mindsets, interests, resources and incentive structures, and/or are influenced by political agendas, which may lead to weak attention to the project objectives.</li> <li>• Partners may lack the capacities required to engage in systems research and integration, and for virtual collaboration and e-communication. Capacities built over time may disappear with staff turnover.</li> </ul>
Research quality	<ul style="list-style-type: none"> <li>• Research quality may suffer from integration as broadening research may come at the expense of deepening, although it also meant the possibility of new research on the performance of the integrated packages through among others an integrated impact assessment design with an integrated survey instrument.</li> </ul>

Source: Author compilation based on virtual learning weeks.





Photo: JST/William Makulwa

Training of vaccinators in Mbeya, Tanzania

# LESSONS FOR RESEARCH FOR DEVELOPMENT

The lessons learned on livestock research for development, generated through joint reflection through the processes described earlier (see page 6), are presented in this section, organised according to four key themes that emerged from the process, and we described as integration 'types'; planning and design of integrated projects, integrated teams, integrated packages, and integrated delivery (and platforms).

## PLANNING AND DESIGN OF INTEGRATED PROJECTS

The starting point of each priority country project was a planning meeting with local partners in which objectives were set, a ToC was developed and used as a basis for proposal development. The ToCs were developed for the long-term, going beyond the timeline of the projects, which meant that the projects were unlikely to reach far beyond the level of early outcomes during this phase. Having these end goals in mind however supported the focus of the activities. As will be further elaborated in the section on partnerships (page 17) this is also of key importance for the development of the required partnerships to eventually reach impact at scale.

While in the early stages of the Livestock (and Fish) CRPs, scientists tended to be siloed in their respective flagships (themes/disciplines) even though work was taking place in the same value chains, the priority country projects helped to generate a stronger focus on integration. A number of lessons were learned with regard to the planning and design phase of the projects.

1. Ensure project goals are formulated from the perspective of the end user, consider the needs of different social groups, and reflect the interests of different partners. This also means including project activities and objectives that go beyond research (e.g., capacity building, service delivery) is needed from the start. Shared research objectives may not be needed (with non-research partners), but a common goal is a prerequisite, and the research

should clearly support the achievement of the joint goals. This also means research is balanced with other activities, and that plans are aligned with the interests of partners, e.g., national, or regional government plans, and with incentives of the private sector. This process also needs to ensure that the project is relevant to the context.

2. Recognise synergies between disciplines and align incentives of different partners to foster collaboration.
3. Project planning needs to be done in a collaborative manner with the needs of the end user in mind, aligning to their calendars and merging activities to create efficiencies and clarity for end users on how the components fit together. This means synchronising and improved sequencing of activities to facilitate integration, using an iterative process, adapting to new challenges that arise.
4. Branding of the projects was found to be important. It created recognition among users of the synergy between activities and a sense of ownership among partners and next users.
5. Communication between researchers, and with project partners on the ground, is a key determinant for success. Regular meetings, joint project calendars and other tools can be used to promote this (see also page 16).

## VIETNAM: USE OF LIVESTOCK CRP DIAGNOSTIC TOOL

The country project in Vietnam had a different starting point than the other three country projects, as a new site was chosen, and a farming system approach was adopted, shifting away from the strict focus on the pig value chain in the earlier phases the CRP Livestock and Fish. Therefore, the project started in 2019, with several scoping assessments, using diagnostic tools developed or refined during earlier stages of the CRP Livestock (and CRP Livestock and Fish).

## TANZANIA: PROJECT BRANDING

In Tanzania, the program activities of the current and previous phases of Livestock CRP funding have been branded under one common umbrella: 'Maziwa Zaidi'. The advantages of this branding are: 1) not confusing clients especially farmers with many labels for program activities and 2) acting as a glue for fostering interdisciplinarity locally and across flagships. Maziwa Zaidi has become known as a dependable forum/partner – motivating for farmers and other stakeholders. The brand name also motivates farmers.

## INTEGRATED TEAMS

Project teams consisted of the CGIAR researchers and all partners, including different levels of government, and private sector partners.

A key condition for integration to succeed was found to be the ability and willingness of people to work together in a collaborative manner. A number of key lessons were generated on how to do this effectively:

1. Belief in integration: Having a team of researchers that believes in the benefits of integrated approaches, and some champions that are willing to take the lead in a different way of organising research. Assessing and addressing buy-in among people involved is important.
2. Common objectives: setting (development) objectives together that are able to direct research activities will support researchers from different disciplines, as well as non-research partners to align in their activities. These objectives also need to be in line with the needs of the communities targeted with the interventions.
3. Joint planning and implementation of field activities, and interventions: this can be facilitated by practical tools, such as a joint activity calendar, and having a field coordinator.
4. Good and regular communication between different members of the team and sharing of information and project documents: this can be facilitated by having regular joint meetings to reflect on progress and do joint planning and using digital tools such as MS Teams to share documents (although whether this provides sufficient access for people external to the CGIAR system is questionable), as well as through organising joint reflections. Someone needs to have the responsibility for facilitating such exchanges.
5. Sufficient and dedicated resources (time and budget) to create space for these additional interactions. Longer timeframes (project durations) and long-term commitments may be needed, as well as resources dedicated to reflection and integration. As projects usually depend on donor funding it is

therefore important that funders are made aware of the need of more complex, integrated projects, for which the impact pathways are also more complex. Single bilateral projects rarely allow sufficient time for research to go through all stages until a scalable product. Overambitious plans for scaling can also put unrealistic pressure on partners to quickly achieve results at the cost of the sustainability of the impact.

6. Well-defined roles and responsibilities. This should include dedicated field level coordination to ensure that the interventions are carried out in an integrated manner where one activity feeds into the other.
7. Incentives: creating the right incentives for researchers that reward joint activities and a focus on development outcomes, rather than a focus on publications in peer-reviewed journals.
8. Capacity development: natural scientists do not necessarily have the skills required for systems thinking, dealing with complexity, and keeping impacts of livestock research for development at the forefront. There may also not be a shared understanding of what integration actually means. Investments in developing these capacities can support integration. Capacity development should take place at all levels including the research team, local partners, and next and end users. This should incorporate problem-solving training and mentoring for local partners in the project.
9. Integrated delivery mechanisms: Finding suitable mechanisms for integrated delivery (e.g., digital platforms, or joint community engagement), will facilitate teams to work together in an integrated manner (see also [page 16](#)).
10. Incorporate flexibility and learning into the implementation with adaptive and demand-driven processes, with the needs of the end user in mind, and allowing for opportunism. This means using opportunities that arise through stakeholder engagement, for example, in Uganda where policy engagement was added as a new impact pathway.
11. Include a learning agenda, using the ToC as a guiding tool to reflect on what is working and what is not to refine the implementation if needed. In complex systems, there is a level of uncertainty which means that it is impossible to predict exactly what will happen when an intervention starts and how change will come about. Continuous follow-up and reflection are needed on progress on the ToC and making adaptations based on these reflections.
12. Conventional quantitative indicators for monitoring progress are not sufficient as monitoring should also examine the extent to which expected synergies have been realised as a result of integration, and as perceived by partners and users. In addition, this should assess perspectives on the willingness of local partners to implement the integrated intervention packages as an indication of their potential sustainability beyond the program.



Strong and strategic partnerships are considered essential to ensure the delivery of agricultural research that addresses complexity and systemic change and achieves the goals of poverty reduction and food and nutrition security (ISPC, 2015). Historically, CGIAR has always worked in partnerships, however, the nature of partnerships has changed over the years, and the types and number of partners have expanded.

As such, the right partnerships are considered an essential ingredient for successful scaling. This includes partners that can facilitate non-technical elements of the integrated intervention packages, such as financial service providers, and generally, all other partners required to create the enabling conditions for scaling. Key development partners should be engaged from the onset, to get their buy-in for the intervention packages and the scaling strategy. Once partners are convinced of the effectiveness of the approach or intervention, it is expected that they will support the implementation in other areas. Where scaling depends on private sector partners, establishing the commercial business case of the integrated intervention package is of key importance. A key consideration for all partners involved in scaling is also whether they have the required capacities to do so, and if not, the project needs to ensure that these are strengthened through knowledge sharing and by providing problem-solving training and mentoring support.

New partners may be needed to create the enabling conditions, and gaps in capacities to address critical conditions, therefore, need to be intentionally filled. Where new partners are included to support scaling, clear communication on the integrated intervention packages is key to engaging partners and preparing

### UGANDA: PARTNERSHIPS FOR SCALING

In Uganda, the project team had invested time and energy in establishing partnerships at the start of the program in order to support scaling efforts later. The Uganda team identified a need to provide a platform where different stakeholders can engage with each other, including private sector players and policymakers to discuss the policy environment. In Tanzania, the project team engaged with agripreneurs through an incubation process to take up the integrated intervention package.

scaling strategies. Prepare a dissemination plan for the packages (with simple and accessible guidelines) and present this to different audiences (e.g., policymakers, local leaders, community groups, and extension staff) through the appropriate channels. This requires that the design and implementation processes of the intervention packages are documented, with details on how the packages were adapted to social and ecological conditions and the adaptations made by package users. In the Livestock CRP's priority country projects, scientists recognised the benefits of partnerships to ensure that projects are designed and implemented in ways that are relevant and context-specific and that their long-term effectiveness and sustainability is enhanced by creating local embedding. For the selection and implementation of integrated intervention packages, projects needed to engage with a diversity of partners, including national research organisations, different levels of government, and private sector partners (**Table 4**).



Value chain assessment with pig farmers in Gulu district, Uganda

**Table 4.** Key partners in the priority country projects

Country	Specifics on partnerships
<b>Ethiopia</b>	The country team worked with local research partners and extension before, but now also engage with district offices and service providers who are important partners for scaling the integrated intervention packages. The team has observed that government officials in most of the regions are interested in partnering to up-scale the technologies. Community conversations have been contributing to partnership integration. Local partners and community groups came together to explore and analyse locally relevant issues and develop a joint actionable plan for community-based actions. This approach helped to mobilise partners and act together, as well as help improve the (partnering) capacity of local partners and researchers and share local experiences in the community.
<b>Tanzania</b>	The country project aims to incorporate dairy agribusinesses to deliver the best-bet technologies and products to dairy producers. Incubation service providers are contracted to capacitate the agri-businesses and adopt a market systems approach, while synergy is also sought with development partners to ensure there is an enabling environment for the agri-businesses to thrive. In particular in Tanzania, where the enabling context and business competitiveness are ranked low compared to other East African countries, finding the right partners is important.
<b>Uganda</b>	The genetics team is creating a partnership with private sector companies (AbacusBio from New Zealand and VetLine services from Uganda, as well as a public sector company (Makerere University). The willingness to make this partnership succeed is high, and the aim is to leverage on each other's resources, e.g., the use of PigBoost as a tool, Vetline services training inseminators on the ground, or partners using each other's project sites. The scaling scan in Uganda, however, revealed that partners from the financial sector will be essential to initiate scaling, but are yet to be included in the partnerships. It was also recognised that the constellation of partners may change over time, depending on the project phase.
<b>Vietnam</b>	With travel restrictions of the CGIAR staff from Hanoi to the project sites, local partners were instrumental in Vietnam for the continuation of the project. A designated field coordinator managed the engagements. Partners were directly involved in delivering trainings to farmers and vets and extension workers.

Source: Authors' compilation based on virtual learning weeks and reflections on ToCs.

However, building effective partnerships is not straightforward and requires specific capacities and skills. Challenges that the priority country projects encountered in building partnerships included the different objectives, interests and levels of understanding of different actors, differences in availability of time and resources for meaningful engagement (see also **Table 3**), and the different levels of political clout when engaging with different levels of government (e.g. national versus district level). During the implementation of the priority country projects, a number of practical lessons emerged on how to create meaningful and effective partnerships.

A key lesson was about the importance of recognising and valuing the knowledge, expertise and skills that each partner brings. The local knowledge of partners built through years of experience and previous projects, is instrumental in understanding the local context and ensuring the project is relevant. Complementarity of partners is also important. This ensures that each can play their role, and the project can build on each of partners' strengths.

#### **TANZANIA: CO-CREATION WITH PARTNERS**

In Maziwa Zaidi, the process of co-creation of the project design through workshops with partners and beneficiaries was followed by bilateral meetings to explore synergies in pilot sites. In these meetings opportunities for partnership were jointly identified and coordinated actions to fill gaps in capacity building and learning, building on lessons from ongoing development projects implemented by them (e.g., they shared their baseline and outcome survey reports) were planned. New partners were added as project activities progressed e.g. one partner recently joined as a result of an elaborate process of identifying suitable service providers for incubation.



To foster partnerships, a number of practices were identified, related to communication, knowledge sharing and effective engagement:

1. **Building of trust** is one of the key elements of effective partnerships. Not only formal linkages and activities create strong partnerships, but also strong social and personal bonds foster trust. Allow incubation time to build trust and ownership among partners. Co-creation and joint project design can support this process. There is also a need for physical presence, of researchers, to engage with stakeholders, learn and adjust to change during implementation. Community approaches are seen as effective approaches to engage with end users and develop a joint understanding of their challenges, needs and interests.
2. **Setting joint objectives** that meet the interests and stakes of different partners, including project activities and objectives that go beyond research (e.g., capacity building, service delivery) is needed from the start. Shared research objectives may not be needed (with non-research partners), but a **common goal** is a prerequisite, and the research should clearly support the achievement of the joint goals. This also means research is balanced with other activities, and that plans are aligned with interests of partners, e.g., national, or regional government plans, and with incentives of the private sector; all partners need to be able to see the value of the partnership for their own agenda.
3. Develop a **joint capacity strengthening strategy** that fills any capacity gaps of all partners and facilitate mutual knowledge exchange and awareness raising between practice, policy and research. This includes making research findings and innovations accessible and learning about local conditions and experiences from partners. Creating awareness about the technologies (or innovations) can foster

### UGANDA: ENGAGEMENT OF POLICY PARTNERS

The MorePork project in Uganda developed a policy brief on heat stress which created interest among policymakers. When writing the policy brief, the research collaborated with non-research partners, in particular ministry staff. This helped to create interest in the topic for the following reason:

1. The ministry staff were already involved in the writing process of the policy brief and thus shared ownership over the brief.
2. In the process, there is a facilitator within the ministry who is well connected.
3. The research findings that are being shared, are well 'manicured' and digested, and prepared in a visually appealing manner for policymakers.

trust in research outputs. Different mechanisms can be used to achieve this, such as working with a Community of Practice on a key theme (used in Ethiopia). Yet, it is also important that exchanges are targeted and take into account all partners' time and resource constraints.

4. **Ensure there is clear expectation management between partners**, with well-defined roles and the nurturing of an active relationship. Leverage each other's resources and capacities but be aware of each other's constraints.
5. Engage partners not only in the planning and implementation but also in the **production of knowledge products** to garner trust, ownership, and commitment in the project (e.g., training materials, policy briefs). Local partners are key to provide reflections on the contextual relevance of knowledge and innovations.



Household survey by Livestock CRP in Son La Province, Vietnam

## INTEGRATED INTERVENTION PACKAGES

**Table 5** provides an overview of the integrated intervention packages that were tested in each priority country. The original best-bets were developed within a specific value chain and country. As they were expected to be relevant to the context in which they were to be delivered, they were not necessarily developed with

integration in mind. While some best-bet interventions combined synergistically with one another e.g., forage interventions and the environment, or breeding, feeding and health practices for livestock and/or technical and institutional interventions for improved marketing of livestock, for others integration was less obvious or less easily achieved.

**Table 5.** Descriptions of integrated intervention packages in each country

Country	Specifics on partnerships
<b>Ethiopia: SmaRT Pack for small ruminant producers</b>	Pilot 'best-bets' tested over many years are being packaged as one bigger intervention to increase productivity of small ruminant producers; this means that all interventions are packaged and offered in all sites. This is called the 'SmaRT Pack' and includes health (parasite or respiratory disease control) breeding (ewe selection), feeding (ration balancing for fattening), and marketing (youth groups for collective marketing) – all inputs that are needed to impact the livelihood of small ruminant farmers.
<b>Tanzania: Maziwa Zaidi for dairy producers</b>	The technical products for the delivery packages to be leveraged by agribusiness targeting producers were identified as Brachiaria grass (or other forage options), manure management, East Coast fever vaccine, and artificial insemination. These are delivered through capacitated agripreneurs and agribusinesses using digital platforms for farmer profiling and e-extension; and capacity development supporting market access, safer products, and effective collective action. Two types of packages exist: 1) enabling packages targeting agripreneurs; 2) delivery packages targeting smallholder dairy producers. Both packages consist of three elements: a set of technologies; a set of institutional and delivery components to enable access to the technologies; and a set of actions to grow technical and business capacities to take up and deliver the packages.
<b>Uganda PigSMART</b>	The integrated packages being implemented in Uganda are delivering a set of technological innovations from the flagships to the relevant value chain actors. This involves joint planning and delivery ensuring that value chain actors experience a seamless process of engagement. Flagship innovations are sequentially rolled out following the value chain logic so that farmers and other actors are engaged at the right time. The technologies include herd health, community-based AI in pigs, improved forages, manure management, heat stress, and a business model for improved commercial feeds through training and certification. It also brings in the important element of strengthening market linkages between pig farmers and buyers (aggregators) and input suppliers to incentivise uptake of the technology pieces. There is the extension component through the pigSMART platform to expose pig farmers to the technologies while also enhancing linkages between value chain actors.
<b>Vietnam</b>	Interventions from the different flagships/themes (feed, health, breeding, market, gender, market etc.) are developed in the same sites and among the same communities with a common purpose. The nature of the intervention takes account of the needs and constraints in other flagships and are supportive of each other.

Given that interventions need to be adapted to meet the needs of diverse user groups, flexibility in defining integrated packages for different social groups and contextual factors was considered desirable, as different combinations of best-bets could work for different contexts. To be able to compose suitable integrated packages, it is important to carefully evaluate the compatibility between the required conditions for interventions to succeed and the local conditions at community level. While flexibility is desirable, this also complicates the evaluation of the effect of the integrated intervention package as there are multiple

types of interventions with varied levels of inter-dependence.

As the ultimate goal is for the packages to go to scale, this also means there is a need to ensure that the integrated packages are suitable for scaling (both in technical and non-technical terms). If scaling conditions cannot be created, the investments made in the projects are essentially wasted. A so-called 'scaling scan' can be helpful to assess this. This includes elements such as access to finance and insurance, market demand, or policies and regulations. The integrated nature of the



intervention package, and the complexity this comes with, also results in more complexity in the enabling conditions that need to be created for the package to be taken to scale. This also means that scaling should not be just an afterthought but needs to be considered early-on in the research project.

## INTEGRATED DELIVERY MECHANISMS

The delivery mechanisms of the intervention packages were key vehicles for integration, engagement and inclusion. The packaging and delivery of the bundled

intervention packages is an important determinant for their adoption and scaling potential. Vehicles used in the priority country projects included the integration of services provided to end users through one-stop service providers (agripreneurs, vets, extension workers), the use of ICT tools (i.e., digital platforms and apps) to bring together information or create market linkages, and the use of innovative research tools such as PhotoVoice which engages communities in monitoring and evaluation (**Table 6**). The process of breaking down content to deliver 'simple' messages also challenged researchers to bring different pieces of research together and it makes integration more concrete.

**Table 6.** Delivery approaches and vehicles used in the priority country projects

Country	Vehicle(s) for integration
Ethiopia	Community Conversations were used as an approach and platform to facilitate integrated delivery. These are facilitated dialogues among community members and local partners to explore and analyse the knowledge, attitudes, and practices (KAP) of livestock marketing, the importance of collective livestock marketing, and solutions to solve livestock marketing problems. This mechanism brings local partners and community groups together for raising awareness, building commitment for collective action while disseminating information about technical interventions in the area of sheep-fattening. For instance, discussions in the sheep-fattening groups provided useful insights into feeding practices and utilisation of feed resources, and knowledge gaps regarding market access. The information shared by youth group members revealed misconceptions, outdated information shared by the extension workers and enumerators who seldom visit the groups.
Tanzania	The main delivery mechanism in Tanzania were the agripreneurs. These agripreneurs were facilitated to profitably deliver the technology package to farmers through agribusiness incubation and acceleration programs. Artificial Insemination (AI) service providers have been supported to better plan breeding services through the African Dairy genetic Gains ICT platform which also enable government veterinarians to monitor their breeding activities. The same ICT platform provides farmers with technical advice on appropriate animal husbandry practices for productivity enhancement, and information to the AI service provider on how to reduce calving interval and optimise breeding. A second vehicle for integration has been the project's policy engagement. Because this forced researchers to look at the different technologies and interventions and assess how they align with and help to achieve the government's Livestock Master Plan. This resulted in combining research outcomes from different disciplines into a joint "product" (the policy brief and the briefing).
Uganda	In Uganda the PigSmart platform was promoted amongst farmers and village agents. PigSmart was a scalable platform for a number of pig value chain services. Solutions rolled out by project partners in Uganda were a feed calculator (identifying best feed formulations and local ingredients), a gross margin calculator (calculating farm input and output costs) and production, financial and market services (product demand reports and audio and video messaging on animal health, feeding practices, manure management etc.). The project anticipated that partnerships through PigSmart would attract further private digital companies and investment.
Vietnam	Vietnam had several delivery mechanisms: Demonstration farms and joint trainings of farmers, delivery of services through trained and mentored vets and extension workers, community engagement using Photovoice for monitoring and evaluation, engaging users into the research, farmer common interest groups for farmer engagement.

Source: Authors' compilation based on virtual learning weeks.



## KEY TAKEAWAYS

*Training on genetic selection and breeding, Son La Province, Vietnam*

The lessons formulated in this document can be synthesised into a number of key takeaways for livestock research for development. This list should not be seen as an exhaustive 'how to'-guide; rather it has been formulated as a checklist to consider when designing and implementing a project and

preparing for scaling. The takeaways have been grouped according to three broad phases within a project: 1) planning and design, partnerships and project organisation, 2) implementation monitoring, evaluation, learning and adaptation, and 3) (preparing for) scaling.

**Table 7. Checklist for LR4D projects**

Issues to consider	How to assess if you have achieved it
<b>Planning, design partnerships and organisation</b>	
<p>Project has a shared vision with the end-user in mind and reflects interests of all partners involved. This is reflected in:</p> <ul style="list-style-type: none"> <li>• A joint project vision and goal, aimed at impact on the ground for end users</li> <li>• Inclusive and joint project design and planning processes</li> <li>• Good understanding of context prior to design and/or scope for doing so in the inception phase</li> <li>• A reasonably well formulated ToC with all underlying assumptions as far possible</li> <li>• Consensus on/Joint (multi-disciplinary) research objectives and research questions</li> <li>• Clear project outcomes and indicators that reflect project goal and ToC</li> <li>• Due attention to scaling ingredients.</li> </ul>	<ul style="list-style-type: none"> <li>• Project partners (and stakeholders) participate in a well-facilitated, inclusive project design and planning process that genuinely considers all partners perspectives; participants include researchers and development professionals from government and private sector partner organisations.</li> <li>• The objectives, outcomes and interventions identified reflect a shared vision with focus on behavioural changes in next users and end user groups needed to achieve impact – the latter are captured in the research questions.</li> <li>• The objectives, outcomes and interventions identified in the impact pathways duly recognise the experience, skills, and knowledge each partner brings in.</li> <li>• Research plan specifies how livestock research is embedded within context analysis.</li> <li>• The MEL plan aligns with the impact pathways in the ToC that makes explicit the outcomes and the underlying assumptions influencing achievement of those outcomes –at different stages of the project.</li> <li>• The assumptions are checked against essential scaling ingredients.</li> </ul>



The project plan allows for reflection and adaptation and is aligned with next user needs.	<p>The project plan:</p> <ul style="list-style-type: none"> <li>• Includes regular moments for reflection and is open to adaptation as needed</li> <li>• Is aligned with end user seasonal activity calendars and considers sequencing of activities.</li> <li>• Has a realistic timeline and sufficient budget that allows for adaptation.</li> </ul>
The project budget has adequate provision for reflection and adaptation, capacity development of research staff and partners, and scope to include/replace partners.	<p>The project budget includes specific budget lines for costs related to:</p> <ul style="list-style-type: none"> <li>• Regular reflection meetings both online and in person.</li> <li>• Training and coaching of project teams and partners.</li> <li>• Induction of new partners when needed in course of implementation.</li> <li>• Scope to make amendments based on reflections (e.g., to add partners or activities).</li> </ul>
Well-thought-out partnership strategy developed that includes different types of partners required, as well as strategies to engage them and build their capacities.	<p>The partners include those:</p> <ul style="list-style-type: none"> <li>• With multi-sectoral expertise, relevant for different project phases and critical leverage points.</li> <li>• Who can ensure embedding in local context.</li> <li>• Who can ensure next user and end user engagement.</li> <li>• Who contribute to/address critical scaling ingredients.</li> </ul>
Project branding	<p>The project partners agree on a common name for the project that all partners relate to. Likewise, they also develop a matching logo for all stakeholders to identify with.</p>
Incentives that promote joint activities	<p>Project work plans and MEL plans incorporate incentives for different partners/ stakeholders to engage with one another in project implementation. Similar incentives could also be discussed in individual annual performance reviews. Examples of incentives for researchers:</p> <ul style="list-style-type: none"> <li>• Multi-disciplinary research papers.</li> <li>• Non-peer reviewed type outputs such as working papers, presentations in conferences.</li> </ul> <p>For other partners:</p> <ul style="list-style-type: none"> <li>• Ensure that project activities (outcomes and impacts) align with their individual or organisational goals, targets, and incentives. For example, government officers achieving targets set in national or lower-level targets, or profits for private sector partners.</li> </ul>
Well-defined roles and responsibilities	<p>Agreement on sharing of roles and responsibilities based on due recognition of strengths (competencies and experience) and resource limitations of different partners and their staff in the project team. The agreements are revisited regularly. The project leader or other team member has been assigned the responsibility to follow up on adaptations or actions after such reflection meetings.</p>
Good communication tools.	<p>Different means of communicating with research staff and partners established, such as:</p> <ul style="list-style-type: none"> <li>• Periodic meetings.</li> <li>• A joint project workplan and calendar.</li> <li>• Sharing of documents and resources across all project partners (e.g., via MS Teams or Dropbox folders) with someone assigned to monitor and coordinate.</li> </ul>
Capacity strengthening plan that fosters collaboration and trust but also considers limits in partners' time and resources.	<p>The capacity strengthening plan includes filling the capacity gaps of researchers and partners and facilitates mutual knowledge exchange.</p>
Planning of joint knowledge products.	<p>The project plan includes ideas for (some) joint knowledge products that meet the interests of different partners involved, or scope to formulate those.</p>

### Implementation, monitoring, evaluation, learning and adaptation

Research includes integrated MEL and learning agenda.	<ul style="list-style-type: none"> <li>• The MEL plan specifies indicators for behaviours that need to change, as well as targets, and means of verification.</li> <li>• Trip and field reports include reporting on challenges and opportunities for adoption of intervention packages (i.e., check on the logic of the ToC).</li> <li>• MEL plan includes data on unintended consequences (positive/negative) and impact on different social groups.</li> </ul>
Research design specifies mixed methods approaches.	The research design explains rationale for mixed methods approaches for collecting relevant data to address research questions and collect data on integrated outcomes and behavioural change processes.
Formulation of an 'appropriate' intervention package.	A consultative process has been used to arrive at a suitable bundling of innovations (for a given context). This includes assessing critical bottlenecks and the intervention package reflects this.
Development of delivery mechanisms suitable for the context and user group.	Delivery mechanisms contextualised to suit/capitalise on existing social-institutional and bio-physical conditions, and matching with the partnership's capacities.
Regular reflection meetings to revisit and adapt the ToC and associated activities, outputs, outcomes, assumptions, and partners.	<ul style="list-style-type: none"> <li>• Regular reflection meetings are part of your project calendar</li> <li>• There are several versions of the project's ToC, with documentation on the rationale for adaptation.</li> </ul>

### Scaling

Being clear on what is intended to be scaled and how this will be done	The scaling objectives have been clearly spelled out, including location(s), timeline and budget as well as the proposed strategy.
(Potential for) scaling considered early-on in the process	The innovation(s) have been developed with a view to possible scaling, including what this might look like in different contexts.
Commitment to support the scaling process: capacity building of partners	Resources and expertise are available to support any required capacity development of partners for scaling.
Scaling ingredients have been considered	Possible weaknesses have been identified by way of a Scaling Scan or a Scaling Readiness assessment, and your scaling strategy is adapted accordingly.
Key partners and networks for scaling are identified and supportive	There are commitments from partners to mobilise, support and resource the scaling plan. There is agreement on who needs to do what, and how.



Feeding improved cattle with chopped maize crop residues, Babati, Tanzania





Photo: ILRI/Paul Karaimu

A goat shed in Pongwe area of Tanga, Tanzania

## DISCUSSION

Over ten years (2012-2021), the CGIAR Research programs on Livestock Agri-Food systems and its predecessor, the CRP Livestock and Fish, worked under the hypothesis that, because of their nature, livestock systems require integration of genetics, animal health, feed technologies and institutional innovations to achieve significant system change. The CRP on Livestock and Fish set out to work in five livestock value chains (and two fish value chains), establishing country teams and partnerships, and conducting initial scoping assessments, followed by the development and testing of innovations to address any issues identified.

After six years, when the research program was evaluated with regard to its socioeconomic impact on smallholder livestock farmers, several shortcomings were identified. Salient among those were – insufficient management support for the country teams from program management, weak integration of different thematic research outputs within the countries and limited cross-country research. The priority country projects, which started in 2019, sought to address the shortcomings by focussing on the content of intervention packages and their delivery mechanisms and aligning research objectives and questions with a livestock research for development (LR4D) model. Thus, the new CRP projects provided a stronger mandate to the country teams, with the better embedding of the thematic research outputs within the countries.

While summarising the learnings generated during this process, seven issues stood out for further reflection.

### How much time is needed to see the results of an integrated approach?

Each country project was planned as a three-year project, however, given that the first year was spent on planning, stakeholder engagement and proposal development, only two years remained for actual implementation. Furthermore, the implementation coincided with the COVID-19 pandemic, which hampered the carrying out of activities. Nonetheless, the country teams made significant steps towards improving how they worked together, periodically

reflecting on their ToCs and ascertaining the validity of the interventions given their development outcomes, aligning research outputs, and building on the stakeholder collaborations established during the earlier stages of the CRP. The process was iterative (neither smooth nor linear) and needed regular reflection and adaptation. Results are visible (further elaborated in Kruijssen et al., 2021b), yet in all cases, results only reach up to the early to intermediate outcome level. The projects simply did not have sufficient time to achieve long-term impacts because of the complex issues they are tackling. This in itself is not an issue, as work in the value chains can continue, however, it does imply that continuity needs to be ensured.

### Are the integration of teams and intervention packages means to an end or goals in themselves?

In the priority country projects, integration was not intended as an outcome in itself, but rather a means to achieve the goal of livestock research contributing to (development) impact at scale. The process of integration is considered a prerequisite for impact related to poverty reduction and increased food and nutrition security. This implies that teams need continuous reflection on integration processes as they occur during project implementation, accompanied by adaptation of project plans wherever required. This also suggests that there is no 'right' or 'wrong' way of reflecting and/or adapting, or that any of the types of integration (aggregation, harmonization or integration) is superior to the others. Therefore, rather than creating a tool or manual, the learnings provide a set of pointers to improve the process of integration that can accelerate the achievement of development impacts through livestock research.

### Livestock research for development or integrated research for livestock development?

It should be recognised that what we have discussed in this document is not about integrated research i.e. 'interdisciplinary research', but is about the combining of innovations, i.e. the earlier research results, into integrated innovation packages, delivering them in an

integrated manner, and conducting (action) research around this process. The priority country projects bundled specific innovations (technical as well as institutional ) developed and tested in the first phase of the program according to their own disciplinary concepts and frameworks. With reference to the three levels of integration outlined in Section 1.2 namely aggregation, harmonisation, and integration, it can be concluded that the priority country projects were successful in aggregating and harmonising the best-bet innovations. With a stronger focus on a coherent set of objectives, and on delivery mechanisms for the intervention packages the latter became the ‘vehicles’ for harmonising) and/or integrating into the country projects. The process entailed multiple strategies for individual user groups, as well as for creating linkages between the different user groups. These linkages are important as the different stakeholders would eventually need to (continue to) work together towards systems change.

### Aggregation, harmonisation or beyond?

It should be considered that to achieve socio-economic impacts through livestock development, all critical leverage points in livestock value chains need to be addressed (i.e. those major levers or bottlenecks), and as such it requires integration (or harmonisation) of all critical interventions, not just those that are ‘easy’ or within reach. This means that the more practical technological issues to be addressed together with the harder-to-achieve social-institutional changes needed if the technologies are to be adopted. This was evident in the country programs where the technological best-bets considered ‘easier’ to bundle had limited response constrained due to lack of access to finance, which in turn, was not sufficiently addressed on the research agenda and/or as part of the interventions. Addressing this would have also required the creation of new partnerships and adjustments to project implementation plans.

### Who decides?

We observe the inherent challenge of what the Livestock CRP set out to do in the context of the boundaries of donor funding schemes and the research mandate of the CGIAR. The donor emphasis on technical and productivity-enhancing research means that the projects, almost by default, are not set up to deliver comprehensive integrated packages. There is also a question of capacity, as delivery requires community-based interventions and competencies in social-engineering seen as the mandate of government and/or NGO workers. Another important factor is project timelines, as systems change takes time, even more so for livestock production than for (crop) agricultural systems.

### How to achieve scale with integrated packages?

The priority country projects did not manage to generate much learning about scaling, as those involved thought that it was too early in the process to do so (even more so in Vietnam). Yet, the scaling ingredients from the scaling readiness scan conducted in each priority country provided useful entry-points to assess and factor-in actions with (the potential for) scaling. For example, in Ethiopia, capacitating government extension officers was initially seen as a strategy to promote SmaRT Pack to reach small ruminant producers beyond the project area, and eventually institutionalise the package. However, in course of implementation, the project implementers realised that owing to competing demands on their time for government projects and tasks, most officers were not able to spare time to promote SmaRT Pack. This also confirms that *the outcomes of every intervention are highly dependent on the specific context of the countries and the social change processes that happen within this context*. Therefore, scaling up and scaling out an intervention package in a specific context requires a thorough understanding of what makes the intervention package work (the why and how) in that given context. This also means that in order to achieve scale, both the delivery mechanism as well as the (content of the) intervention package need to be tweaked to fit every new social and institutional context. The addition of the new project in Vietnam demonstrated that once processes (tools) are developed to provide a contextual understanding, this can be done rapidly.

Another related observation is that pilot projects differ from interventions at scale by virtue of the resources, capacities and focus available for pilot projects that are unfeasible for large scale implementation. Government partners are key to achieving scale at a national level, and the mechanisms to achieve this will also differ by context.

### How to evaluate integration?

Finally, we reflected on the process of evaluating livestock research for development and, in particular, the integration process. This relates to two different ideas:

1. The evaluation of the process of integration itself i.e. to assess the level of integration achieved by the project (team) per type of integration. For example, in the context of integrated teams, it would entail:
  - Aggregation: Exchange of information is taking place for mutual benefit (networking).
  - Harmonisation: Someone is keeping track of who is doing what and what that results in; activities are being adapted to one another to achieve a common goal (coordination).



- Integration: Shared activities and resources, and one another's capacities are being enhanced in view of institutionalising approaches (cooperation and collaboration).
2. Evaluating the added value of integration, which means examining the question: "Are better outcomes/impacts being achieved by integration compared to doing them in isolation i.e., business as usual?" (or in other words, is the whole more than the sum of the parts?). This requires a combination

of quantitative and qualitative methods not only to assess what changes are taking place, with how many but also how and why change is taking place, and also what the change is leading to. At the same time, this approach should be flexible enough to accommodate modifications and adaptations to the project activities, impact pathways/ToC and indicators, while evaluating outcomes and impacts against them.



*Cattle being watered at the Ghibe River in south-western Ethiopia*



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*Cambra pigs in Kazinga Village, Mukono, Uganda*

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