

Info Note

Accelerating innovation development and scaling processes for agricultural transformation

Insights from the Side Event on Scaling, 5th Global Science Conference on CSA, 2019

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Key messages

- Agricultural transformation calls for systemic solutions, which will change the way innovations are developed or prioritized for scaling.
- Currently, one of the biggest challenges is moving from piloting projects to sustaining change at scale.
- Scaling pathways, partners and funding schemes become increasingly diverse.
- One of the biggest common bottlenecks for scaling are the needed time and resources. How to make these processes more efficient?
- Different partners need different knowledge, skills and evidence, for different purposes, at different times, and delivered in different forms.
- CCAFS proposes to develop and test the most relevant knowledge matching approaches for scaling CSA, including personal interaction spaces.

There is need, money and momentum!

The UN Climate Action Summit 2019 called for collective action of all sectors of society to deal with the effects of climate change. Governments and major corporations made unprecedented commitments to reduce emissions: 65 countries aim for net zero emissions by 2050, while more than \$2 trillion in investments shall be moved to carbon-neutral investment portfolios by 2050. One-third of the global banking sector aims to align their businesses with the Paris agreement goals.

CCAFS and CGIAR science has proven potential to inform, equip and guide these initiatives, and the Bill and Melinda Gates Foundation announced to double the support to the CGIAR to \$310 million over the next three years to enhance the resilience of smallholder farmers. With all this commitment and investments, what is still missing?

The landscape for innovation and scaling in agriculture is changing

From pushing innovations to pulling solutions

Innovation and scaling processes can range in their focus from promoting the uptake of certain technologies (packages, services ...) to seeking sustainable impact through systemic approaches. Technology innovations are often seen a “solution looking for a problem”. The call for concerted action points to a reverse approach, with certain contexts identifying the “problems”, and several (sets of) innovations offering possible solutions. Although these “reverse scaling” approaches ultimately also result in the promotion of identified technologies, recent initiatives suggest that a shifting ownership in agenda-setting entails a broader portfolio of solutions to choose from:

- CGIAR’s 2-Degree Initiative, defining geographical and thematic grand challenges, and calling for multi-disciplinary solutions across CGIAR centers and research programs;
- CCAFS’ Initiative “Transforming Food Systems in a Changing Climate”, with > 100 multi-sectoral stakeholders outlining future areas for research and action;
- Countries’ Action Plans to reduce emissions and increase adaptation, as outlined in their Nationally Determined Contributions (NDCs), looking for solutions including, but also beyond agriculture.

A multitude of new partners and roles

The policy and business sectors are currently seen as main crucial players for bringing agricultural innovations to scale. However, both sectors are highly diverse and need to be differentiated further. The roles of partners are in-

creasingly diffused, with different entities taking on different roles, even on case basis. New investment models blur the lines between public and private responsibilities.

New finance mechanisms can tackle bottlenecks

Funding sources similarly undergo more differentiation, while at the same time forms and functions blur. The traditional donor funding is often perceived as not supportive to scaling initiatives, mainly for its short time horizon, coupled with unrealistic expectations and linear implementation models. New funding sources from climate finance, philanthropy and investment need to cover three crucial moments of innovation and scaling processes:

- Seed funding for pre-pilot testing, especially when simple, frugal innovations are involved. Specialized innovation funds tend to focus on high-end solutions, provided by agri-businesses (mainly start-ups).
- Scaling beyond a pilot project to a stage that becomes relevant for financing/investments/behavior change. It is easier to find funding for each individual component of an innovation, and for developing pathways to optimize these different aspects, then to actually scale.
- After policy formulation, at the implementation phase of contractual large scaling commitments (e.g. national or regional projects supported by climate finance funds).

Multi-Sectoral Insight Group: At the 5th Global Science Conference on Climate-Smart Agriculture in Bali, CCAFS, IFAD and USDA-FAS organized the Side event “Accelerating innovation development and scaling climate-smart agriculture to drive a transformation in food systems”. High-level representatives of > 20 governments, research, donor, financial and policy institutions, civil society and private sectors discussed their previously shared insights and agreed to act as an “Insight Group” for further related CCAFS research and action. This Info Note summarizes the groups’ first findings, along with a short proposal for next steps.

Textbox 1. Side event Bali

“Hybrid” innovation development and scaling processes

Traditional linear models are changing towards iterative co-creation processes with partners and stakeholders. These begin with thoroughly understanding the problem and users’ and stakeholders’ needs, followed by iterative try-and-error processes developing and prototyping the workable innovations at the different scales, and to undertake several steps for piloting, refining, and rolling out.

Processes differ per purpose ...

Agricultural transformation can accommodate different pathways of stakeholders’ innovation and scaling.

Depending on the respective purpose, they can contribute different kinds of evidence to the learning agenda:

- **Oriented towards system change:** Scaling processes are seen as expansion and leveraging of stakeholder networks. To achieve and maintain sustainability in specific and changing contexts, these approaches come with strong components on stakeholders’ capacity development, with focus on governmental services and local communities.

Key question: “How did the drivers and spaces for scaling (organizational, policy, fiscal, political, cultural, etc.) change?”

- **Oriented towards programming and learning:** Innovation development and scaling approaches provide safe spaces for experimentation and failure. Intentional risk-taking is complemented by frequent assessments of the suitability of the theory of change/scaling approach, also counting in course corrections.

Key question: “How easy will it be/what is missing to scale a similar intervention also in different contexts?”

- **Oriented towards markets/investments:** Phases for innovation development and scaling reflect market incubation and commercialization processes. Protagonists are either growing farmers’ cooperatives, or private sector companies (start-ups or established ones) sourcing from smallholder farmers, and/or providing services. Assessments of commercial viability can be complemented (to a certain degree) with social indicators, e.g. profit distribution.

Key question: “(How) does the innovation increase the return on investment, or decrease the risk?”

... and per partners

Definition and sequencing of the individual innovation and scaling phases, however, differ among stakeholders. Further, each phase might have different objectives and expected outcomes, thus measuring different kinds of results. E.g., the classical R4D continuum knows only one “scaling phase”, directly following the “pilot phase”, and defined by the number of beneficiaries. Investors will rather look at the “valley of death” (risk > costs) before incubating/venturing their capital. Governments in turn will pilot interventions on their own terms, conditions and scales, e.g. defined by administrative units, when taking on examples of other actors.

Of chutes and ladders – accelerating or stalling?

Actors with different interpretations of innovation and scaling phases can experience surprises in cooperation:

- **Overlaps:** Actors in different phases might need input/evidence before it is “ready” (e.g. when approval processes of regulating agencies need to be started),

- **Leapfrogging:** Examples exist of governments scaling out solutions on basis of proof of concept of < 10 farmers per case – the key was personal exposure.
- **“Back to square one”:** When existing, largely scaled products are being improved, these improvements could be considered as innovations, and might send funding applicants back to “discovery”.

Innovation and scaling processes go hand in hand

Innovations are commonly defined by turning an idea into use for generating value. Depending on the context, this can be new ideas, new uses, or new values. Two thoughts can be derived from this concept:

- The innovation is not only the “what” we scale, but is often also in the “how” we scale, in form of the many adaptations and reconfigurations on the way.
- Innovations in the “how” we scale can also be independent, complementing innovations that are needed to penetrate or change the system.

Since it is very difficult to calculate the costs of scaling processes as such, the notion of constant innovation during scaling processes can help to make these more effective: Can we accelerate innovation and scaling processes by minimizing the costs of innovation through maximizing learning? And if so, what would be needed?

Evidence for moving through innovation and scaling phases

Evidence is crucial for scaling in the different dimensions of decision support, communication and learning. It needs to be generated in the respective operational environment (“real life data”) as opposed to controlled trials. The needed type and rigor of evidence however will be different for different stakeholders, phases and purposes:

- **Decision support and risk mitigation:** Each stage of innovation and scaling processes has its own parameter sets. Aim is to reflect the innovation itself in this current stage, and to indicate if or when it is ready to progress to the next stage. Very important here, but also different per each stakeholders’ needs, are clear assessments of risks and unintended social, economic and environmental consequences.
- **Communication and advocacy:** Clear articulation of problems and interventions with concepts and language that are understood and actionable across all actors is crucial. Tailored information that meets stakeholders’ needs will often undergo numerous iterations itself before landing on a winning formula.
- **Learning and capacity building:** Capturing lessons from each phase is an integral part of planning, fed by and feeding into a structured approach and perspective. However, evidence is often created on demand (e.g. for donors) and not yet used sufficiently for institutional learning and capacity building.

How to accelerate evidence for scaling?

Much of the evidence can be generated from previous or ongoing, successful or failed implementation processes. If monitoring and evaluation systems are designed to be responsive to innovation development and scaling, they can provide the needed data, insights and steering tools.

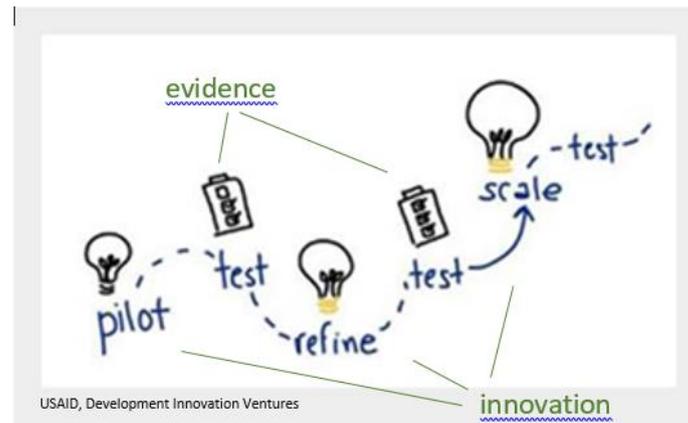


Figure 1: Illustration adapted from Development Innovation Ventures

Partnerships with innovation and scale in mind

Effective partnerships are key for true collaboration and span actors of all sectors and levels, increasingly including intermediaries.

- **Shared vision:** All partners need to see some incentive in pushing for change. Incentives can take different forms. Alignment with the stakeholders companies’ or institutions’ mandate and regulations helps to negotiate agreements and creates a base of trust within the partner organizations.
- **Complementary functions.** While technical partners assure that innovations are applicable and feasible, strategic partners can assure inclusive prioritization processes, and leverage policies and funding.
- **Forms/modalities:** Ideally, partners bring or can leverage their own resources. Agreements range from formalized partnerships to partner networks, but the informal understanding is often equally important.
- **Mindset:** Ideally, partners have a good understanding of the system and can recognize the concept of contribution (vs attribution).
- **Time dimension:** Early partner- and stakeholder engagement is crucial for concerted action, with partners’ involvement intensity varying throughout the different phases of the co-development processes. Ideally, partners have a long-term perspective.

Pitfalls for partnerships aimed at accelerating scale

A strong point was made to avoid “putting all eggs in one basket”: Also frontrunners (champions, drivers) need the support of their institutions. Without, they can become

“single points of failures”. Also, behavior change is not only needed among farmers, but along the whole supply chain and finance community, to shift to new practices.

This points to the need to tailor programs with stronger components for human-centered social learning processes for all stakeholders, and dedicating resources for building relationships and change management capacities.

Multi-stakeholders’ pains and gains

“Time and resources are the largest bottlenecks for innovation development and scaling”

Stakeholders agree that “the biggest challenge comes when efforts and resources need to be sustained beyond pilot projects.” Each deals with different facets of this challenge, with timing and funding being the decisive ones.

Farmers and farmer organizations: The farming sector is perceived as unstructured and rinds only 5% of revenue on average. Farmer organizations can be good aggregators for value creation. Engaged in apex-organizations, smallholder farmers can have voices in policy processes. However, agriculture is risky and goes through several seasons and iterations, with a possible longer-term gap between investment and revenue.

Civil society organizations: Being “of” and “for” the poor, local institutions can be main drivers for innovation development by setting the agenda, exercising convening authority, creating consensus for change and scaling up. Civil society organizations can support and facilitate these long term processes, but their organizational structure depends on donors’ money, which largely foresees an implementing – and therewith shorter term - role for them.

Private sector agri-businesses: Agribusinesses at all levels are particularly important to provide market linkage, value chain financing and providing services to help smallholder farmers meeting the required quality and delivery standards. Large companies usually depend on investors that do not care much about social, economic, or environmental impacts, although their clients might do. However, as corporates’ main concerns shift from market competition to resource competition, they increasingly take on varied roles as direct service providers, collaborators and catalysts for smallholder adaptation.

For most companies, increasing farmer resilience to climate change does not require new technologies but simply dissemination of useful information throughout the supply chain. With shrinking research and development budgets, two types of “data companies” emerged: The ones that have many data, but not the time, skill or inclination to fully analyze these, and the ones that increasingly see data exploitation instead of -generation as their core competency. Both need consistent approaches across the main commodities to keep operating costs low, while at the same time they need to understand and respond to context-dependent farmer typologies.

Impact Investors and blended finance can bridge the gap between research and pilots towards achieving high-scale commercial models that scale both themselves and their impact. The funding landscape of investors is very big and can move between purely profit oriented investments and purely social oriented grants, with market -, concessionary, or no returns at all. Equally diverse are their entry points. Some impact investors take on early positions, and support these with technical assistance through the full cycle of value creation (approximately 4-5 years), with increasing commercial and decreasing private capital, until selling to larger financial or strategic investors. More commercial-oriented investors in turn, might provide early high risk venture capital, but also look for a timely exit, which points to a stage-gated investment strategy.

Finding the right investors takes time or professionalized staff/consultants, since the sector still lacks transparency with regard to the different capital flows and requirements.

In turn, for impact investors, it is difficult to measure impacts, since standardization here is still limited. Another challenge is to attract private investment to innovations benefiting small-scale farmers (for example land restoration) without direct business cases. A strong point was made, however, that investors always “invest in people, not in projects”.

Governments can be main drivers of scaling up by creating the needed spaces, particularly in the fiscal, political, policy, organizational and learning areas. They can provide funding themselves, catalyze/leverage funding with the private sector and/or other actors, and maintain good business intelligence functions. Government processes are risk adverse by nature. They need to test political acceptance, navigate systems’ (technical) resistance, and overcome technocratic tensions in and between national entities.

Bilateral donors have a strong mandate for funding projects at scale in their countries’ priority areas and need to have a timely outflow of funds. Being accountable towards their governments’ voters, they often have short-term project cycles, not covering the full processes of innovation development and scaling.

Multilateral policy and development agencies are well positioned to catalyze complementarities of interventions and can leverage resources by (co-)financing. Currently, they can play a role in bridging the lack of connection between climate finance and banking, and in strengthen the capacities of national governments to bring these two worlds together. However, also for them it is difficult to match funding to ideas that are abstract and unproven. Examples/cases underpinned by data are crucial – but difficult to develop.

Researchers: Academe can provide much of the needed data and evidence on innovative models as well as within value chains. Simulations can help assessing the main variables or crucial elements in packaged solutions and

compare these with alternatives. Researchers increasingly have access to and produce big data and digital tools.

To produce reliable results, research needs time and resources, which have partly been “pre-invested” in the different “blue-sky-research” or “discovery” phases. Donor funding or consultancy contracts are increasingly tailored to short-term and well defined output delivery, which leaves researchers with little margin to invest time and resources into producing new innovations for the pipeline.

Intermediaries: Stakeholders emphasized the important roles of intermediaries, which currently do not receive enough recognition or funding. The landscape of “intermediaries” is increasingly diverse, with actors being defined by their different forms (e.g. start-ups, social enterprises, consultants ...) and functions (e.g. aggregators, brokers, incubators, service providers). New content that can be provided by intermediaries is required e.g. in the domains of de-risking, distribution, learning and change management.

The insight group’s point of view

In two interactive sessions, stakeholders outlined the following ten key principles to accelerate innovation development and scaling:

- **Farmer-centered:** Imperative in all stages, from early problem identification to iterations and scaling.
- **Context matters:** Thoroughly understanding the situations and incentives from different perspectives.
- **Ownership and empowerment:** Let communities and governments drive the process.
- **Problem – solution oriented:** E.g. first assessing the weak links in value chains, then figuring out how the different strengths of partners can tackle them.
- **Sustainable scaling pathways:** Scaling is not a technocratic process. Do a scaling strategy from the start with innovative partnerships and profitable solutions that reduce dependency on grant funding.
- **Cooperation and sharing:** This is crucial. Do NOT try individually. Use pre-competitive spaces with stakeholders that share the purpose.
- **User (farmer)-centered iteration:** Innovation and scaling take time and many iterations (pilot, test, refine...). It is important to find the right methods and to apply them in the right way, e.g. asking open questions without pushing to certain answers
- **Capacity building:** To achieve and maintain sustainability in specific and changing contexts, capacities need to be strengthened in governmental services AND in local communities. This is a priority.
- **Fast failing and learning:** Fail early and often. Failure-friendly testing mechanisms at different levels would absorb risks. Incentivize open-ended reflection

(opposed to “proving that it works”). Do NOT keep evidence and data for yourself. Support knowledge management, document and share your experience.

- **Accountability and transparency:** Make realistic agreements. “Overpromising and under-delivering” (people, capacity, maladaptation) finally has the same result as “quality content without delivery.”

Discussion: Some useful concepts

Pre-competitive spaces for R4D and action

Pre-competitive collaboration brings together otherwise competing stakeholders at early stages of research and development to address shared pain points or systemic bottlenecks. The developed solutions shall “level the playing field”, benefitting all parties, without giving competitive advantage of one over the other. Thus, the output itself is usually not proprietary. Typical pre-competitive spaces aiming to accelerate R4D tackle technical, legal or regulatory issues for sustainable investments and development, e.g. standards.

Originally coined by the private sector, other actors apply similar models, e.g. innovation networks. Pre-competitive spaces can also be convened by governments to call for collective, multi-stakeholder action, e.g. for investment agreements. To avoid the notion of “cartel arrangements”, multi-stakeholder participation with no direct financial interest is crucial, whereby the definition of “pre-competitive” might differ per types of organizations and points in time.

However, the main value of these spaces often lies in strengthening relationships, scouting for the best future partners, for later developing solutions in other collaborative modes along a stage-gated process.

Stage gates versus pit stops

Long-term partnerships with stage gates can be effective mechanisms for investing in promising innovations in an evidence-informed way. However, for hybrid pathways and/or innovations for which no comparable or own predictive data do yet exist, uniform stage gates can slow down or even kill the progress. Alternative scenarios consider “pit-stop” models, with flexible lead times and different technical assistance requirements. Such models, however, require workable criteria and increased investments in learnings to reduce the otherwise elevated transaction costs. Examples also exist where stage-gate models are co-financed by several partners, or just provide incentives (e.g. prize-based) for self-financed participants.

Innovation portfolio management

Innovation management categorizes innovations in different ways. The most common one uses the two axes markets and products, from “existing” to “new”. The corporate reality then parts from known spaces, where proof and data is easily available, to so-called “white spaces”, which would be aspired new areas of

engagement. For the purpose of accelerating innovation development and scaling, four quadrants can be useful:

- **Incremental innovations:** Existing products with existing market structures are improved. While probably not scaling impacts in large quantities, the quality can be improved relatively fast and at low risk.
- **Disruptive innovations:** New products scale through existing markets, disrupting these. Risks are high not only for the companies (e.g. by cannibalization of their existing products), but also for users in form of unintended socio- economic or environmental effects.
- **Architectural innovations:** Scaling out existing products to new markets. In the transformation context, this would mean to scale outcomes, e.g. from one country to another. With climate smart agriculture being extremely context-specific, this can be accelerated and de-risked by using key learnings obtained from previous evidence, plus by the main actors' capacities to innovate (=adapt) themselves.
- **Radical innovations:** Leveraging core competencies for future markets, to define the needed products. This comes closest to the agricultural transformation idea, which can accommodate several types of innovations.

Portfolio management is a concept to optimize innovation investments, aligning the innovation pipeline with the long-term development strategy. Insights and analytics improve transparency in decision making for funding the right mix of projects with maximum value creation and minimum risk. Stage gates allow that the portfolios get regularly adjusted.

Conclusion

Agricultural transformation calls for systemic solutions, which will change the way innovations are developed or prioritized for scaling. Scaling pathways and funding mechanisms are increasingly diverse. Partners play different roles and have different needs for evidence at different stages and for different purposes. Tailored evidence and learning can play a crucial role in making innovation and scaling processes more efficient.

Next proposed steps

CCAFS proposes to develop and test the most relevant knowledge matching approaches for scaling CSA. Matching criteria might include e.g. typologies of innovations, scaling processes and - phases, and partners. The possible interface might be digitally hosted, and offer personal interaction spaces. Additional functions could be e.g. simple features for partner matching, catering for the different demands (e.g. with regard to partners' different functions, timelines, evidence requirements, risk appetites, assistance needed ...). Next proposed steps are:

- **Preparation:** Desk research, participants' and other selected case studies, key stakeholder interviews.
- **Design thinking workshop:** Representatives of the Insight Group outline the features and functions of an interactive knowledge matching facility.
- **Action research:** The most relevant features and functions are iteratively tested and improved in real life scenarios. Learnings and recommendations are shared with the Insight Group and wider scaling community.

This Info Note is based on the insights and active contributions of representatives from CCAFS; CIAT; CIP; CRS; FAO; Fraunhofer Institute; GACSA; Governments of Canada, Indonesia, Mongolia and Vietnam; Hivos; IFAD; Next Einstein Initiative; Olam; Rabobank; SACA; Solidaridad; Universities of Copenhagen, Galway and Leeds; USDA-FAS; Yara, Worldbank.

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