The scaling mindset – shifting from problems to solutions

Insights from the Review of CCAFS Scaling Activities, 2019

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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WorkingPaper

CGIAR

RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**

CCAFS

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Abstract

In the frame of the review of CCAFS scaling activities in 2019, 21 project leaders and – implementers were interviewed about their scaling processes, touching a series of aspects that had been identified as crucial and/or critical by earlier research. Results were analysed with a systemic approach, to draw organisational learnings. The findings were validated with CCAFS core team during their Scaling Workshop in Madrid, May 2019, in which the Core Team also prioritized its programmatic areas of response.

This working paper captures the main insights and learnings from both the interviews on project level, followed by the results' analysis. It then summarized the Core Team workshop's main discussion points and shortly outlines the programmatic areas of response that CCAFS identified.

The learnings and insights on the realities of scaling agricultural innovations presented in this working paper can provide a rich basis for further synthesis and/or deeper research on the different aspects of innovation development and scaling.

Keywords

Climate-smart agriculture; innovation development and scaling; human-centred design; design thinking; scaling mind-set; system thinking; innovation environment

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Acknowledgements

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Acronyms

CCAFS	Climate Change, Agriculture and Food Security
CRP	CGIAR Research Program
CSA	climate-smart agriculture
GSI	gender, youth and social inclusion
KPI	Knowledge Product Incubator
LP6	Learning platform Partnerships and Capacity Building for Scaling CSA
MARLO	Managing Agricultural Research for Learning and Outcomes
ML&E	monitoring, learning and evaluation
ROI	Return on Investments
SEA	Southeast Asia
ToC	Theory of Change
ToR	Terms of Reference

Introduction

Scaling in CCAFS

Global food systems are at the intersection of major challenges under climate change. Climate-smart agriculture (CSA) has emerged as an approach to drive the agricultural transformation. In recent years, the international community has increasingly emphasized the need to bring CSA to scale, to accelerate the transformational agenda.

Since 2009, the CGIAR Research Program Climate Change, Agriculture and Food Security (CCAFS) aims to facilitate this through research and action based on science. As working definition, CCAFS understands scaling as "the set of processes required—in the context of climate variability, climate change and uncertainty about future climate conditions—to go beyond pilot projects through sustainable change (i.e. in knowledge, attitudes and skills) that can bring higher quality solutions to millions of farmers and food system actors in a fast, equitable, inclusive, and lasting manner, towards achieving the Sustainable Development Goals (CCAFS)."

Review of CCAFS Scaling Activities

Since CCAFS entered its second phase (2017-2022), scaling up efforts have been supported by the program's theory of change, and by the crosscutting Learning Platform on Partnerships and Capacity for Scaling CSA (LP6). With the review of CCAFS Scaling Activities, implemented in the first semester of 2019, CCAFS intends to increase its internal learning on scaling, and to steer its scaling processes in the most effective and best possible way.

Premise of the review was that scaling processes are already happening and are being reported on within CCAFS portfolio. In fact, the outcomes of the first two years of CCAFS current phase accumulated to 3 million households that have already been reached by the program.

Based on this premise, this review was commissioned by LP6 to reflect upon the CCAFS project portfolio, to highlight good practices and gaps of CCAFS scaling activities, and to enable institutional learning and improvement from the implementation perspective. The targeted outputs of the review were:

- Information on needs from the implementation level
- Information on structural needs for change within the organization

- Management input from involved staff
- Clear demand orientated mandate for LP6 activities
- Concept of a learning and exchange format as "service product" for LP6
- Implementation of LP6 learning and exchange format

A systemic approach

Scaling is a complex process that happens in complex environments. Therefore, it requires a holistic approach and adaptive systemic management. Further, scaling is a highly user-centric process that can benefit from a business perspective, in terms of usability, added value to both the users and providers, access and distribution, and sustainability. This will require research organisations and projects to respond with changes at a systemic level, including the areas of project design and implementation, M&E, finance, management and organisation.

The review therefore used the concepts of design thinking and system thinking with the aim to draw organisational learnings. These concepts were applied throughout the Reviews process, from the design of the interviews, to the analysis and finally, as concept for a connected Scaling Workshop with the CCAFS Core Team, validating the results and prioritizing next steps.

Methodology

During the review, 21 active practitioners within CCAFS ongoing projects were interviewed from March to May 2019. The interviews were semi-structured, with open lead-questions in order to draw on the practitioners´ experience and perspectives. Interview topics were based on the main findings of the multi-stakeholder CCAFS SEA and cross-CRP Conference on Scaling in Hanoi 2018 (Koerner et al. 2019). Gender, youth and social inclusion were added as additional topic as specified in the review's terms of reference.

The projects were selected in a staged process with criterion of good or excellent results for the latest internal outcome evaluation (2018), scaling activities reported in the internal monitoring tool MARLO and by recommendations. These included projects that had not scaled (yet), but also projects with innovative partnerships, especially in the finance and private sector, and with innovations' potential for disruption. Another criterion was a balanced regional, thematic and centre-representation. The review was concluded with a Workshop on Scaling with the CCAFS Core Team in May 2019 in Madrid.

Main findings

The main findings are presented and discussed in relation to the respective interview topics as considered most expedient by the authors. During the interviews, however, the same recurrent issues were more redundantly mentioned throughout the different topics.

Understanding of scaling

> *"Scaling is leveraging across different projects, a series of synergies and momentums."*

The projects that informed this review were spread across local, national, regional and global levels. Scaling cases ranged from technology packages and climate services to system solutions and approaches like climate-smart villages and citizen science, from data management to institutional support, from mitigation strategies to policy advice and -implementation. Some projects focused directly on testing innovative scaling pathways. Accordingly, scaling was understood differently across projects.

In all cases, the scaling processes were based on long term research, engagement, knowledge and presence in the respective contexts. In most cases, scaling of the innovations was seen as integral part or logical next step of the projects. However, many projects struggled with the meaning of scaling, and perceived a trade-off between reaching the required numbers of beneficiaries, and the quality of their research outputs.

Lessons learnt for scaling

> *"Not only user- but very stakeholder oriented."*

All projects named early engagement of users and stakeholders as crucial factor for innovation uptake and scaling. Degrees of engagement varied, with several projects emphasizing that meaningful engagement would entail to involve users and stakeholders in all critical and programmatic decisions, so that these would really own the approach. One project explicitly worked on "fostering autonomy in the villages and upstream linkage to reduce the dependency from researches."

Some projects noted that early engagement would also foster a participatory, bi-directional learning process that could help projects to better target their research. As one interviewee mentioned, many projects would start with a "boiling the ocean" approach to identify the most important leverage points. Asking the relevant stakeholders in the first place would get them there one or two years earlier.

All projects put solid evidence for their innovations' effectiveness at the core of their scaling processes, with many of them emphasizing that pilot projects need to take place in real settings to discover constraints. In most cases, the exposure of stakeholders to the demonstrated evidence/pilot projects was crucial for their buy in. As one interviewee put it: "It did not acquire attention until people figured it out by themselves." In addition, tools were said to be more useful when users developed them by themselves.

In the same gist, it was stated that more time should be spent on capacity building, especially for national science partners, since these would be "very quick to sustain the processes in the long term". One project working on big data explicitly used universities for "scaling capacities" to develop their own system of data management. They employed strategies from hosting the universities' professionals in their own centre, sharing all script analysis files and building and technically supporting a Community of Practice between the technicians working on these topics, over several years. They also developed several university courses, and curricula for bachelor and master studies.

Another crucial element was the credibility of the innovations themselves, and that solutions would need to bring tangible results and benefits for the farmers. Several projects used bundled approaches, or aimed to "present the user with the entire business case". This would also require entrepreneurial spirit and the involvement of the whole value chain, as well as good economic analysis, which several projects found they lacked in terms of capacities or opportunities to work on.

Many projects further mentioned the need to "link all levels for scaling up and out" as highly important. For this, it was important to create consensus and a common vocabulary. One project described that before they did anything, they had to help "levelling the playing field", to build trust and relationships among the actors.

With regard to the projects' management for scaling, it was stressed that social science should be strongly involved in scaling initiatives, both in terms of the design of the scaling mechanism and/or the choice of distribution channels, as well as for impact evaluations. It was further found beneficial to empower the own team by "learning as we go", fostering entrepreneurial spirit and having a young team that enjoys going to the field. It was also mentioned that iteration processes need to be well documented and socialized, to be able to build on what was said and done in previous workshops.

Summary of findings on scaling with policy incidence: *"Changing the mind-sets of politicians takes time!"*

"In scaling up and out a solution, the political calculus is extremely important. In project design, we have to think about what is in for the politicians, and who can be the best champions for an idea. Governments can be very open when they see that your idea will help them to fulfil their mandate, that the solution is embedded in existing national development programs. But then, political systems also change quickly, and you need a certain degree of adaptation, pragmatism, luck and timing. You need to monitor these developments constantly."

"It is important to understand that it does not end with policies! Policy implications are often not elaborated on. Stakeholders need help to fill national treaties with content (e.g. policies, best practices, partnerships, methods …). In policy incidence, we need to develop arguments of why to change at all levels, and to use simple communication products: Often, people across different levels do not talk with each other!"

"To change policies in a country takes at least one political cycle. And then, policies take up only after another 3-4 years. Measuring impact is highly difficult due to lack of time and budget after the end of the project."

Textbox 1: Summary of findings on scaling with policy incidence.

With regards to solutions that involve several stakeholder groups, projects found it very important to understand the needs and to find the "sweet spots" of all parties, with a clear incentive structure. One interviewee felt that this role of brokering and creating "win-win-win" solutions was often missed in the scaling debate. For example, in his scaling project,

four relevant sectors where deeply involved, but one potentially important sector missed, probably because "they did not have a role in the scaling process".

Challenges for scaling

"There is a gap between action and impact."

Maybe the biggest challenge mentioned by many projects was to provide solid evidence on scaling, related to both proving that it works, and to learning how it works. This was largely attributed to missing impact assessments, but also to missed opportunities in knowledge management.

Another challenge concerned the cooperation with different stakeholder groups, which would require to manage the different interests. Making commitments to stakeholders without really understanding their needs was mentioned as possible pitfall for scaling. Also, not all partners or institutions would change at the same pace.

Several projects also struggled with the business model perspective and finding cost effective scaling models. This would require more economic analyses on costs and benefits in the different context, and also within the different solutions. Stakeholders need to know which part of the packages are the crucial ones that bring the main impact. In addition, "you need to prove that your idea is superior to all the many others currently tested". Another still open area was how to integrate consumer preferences more, and generally, how to assess market demand.

With regard on impact investment, it was found that "the impact investors need a level of detail that we currently cannot deliver." Private sector people would need concrete recommendations with clear cost-benefit analysis and returns on investment: "Overall it is all about risk management: Implementers need to understand the investment and maintenance costs and the time until the investments lead to return on investments (roi), and seek opportunities to bridge the attached risks." Some projects were starting to undertake smaller studies to assess potential rois, others tried to assess what is the potential to scale (e.g. market size) or to quantify the scalability

With regard to the internal management for scaling, projects faced the challenge that the portfolio comprised many small projects, and that the lacking stability of funding would lead to high staff turnover, since "everyone has to work on cost-recovery basis".

Inter-centre cooperation and the set-up of interdisciplinary teams was said to work best on local and personal levels, (e.g. by scaling other centres technologies), but oftentimes missed mid-level involvement. This was attributed to a competition for funds, and would result in different institutes trying to invent their own social sciences. It was also acknowledged that with a diffusion of funds, interventions would become less impactful.

Some interviewees felt strongly that the donors' demand on reaching "numbers" would push the limits of research: It would direct the focus from achieving impact (by reaching large numbers) to reaching scale, potentially at the expense of the quality of the solutions (e.g. by omitting context-specificity, or by aiming for less sustainable solutions). It was expressed that there is a need to manage the expectations between donor communities and what research can contribute, and that a narrative on this would be really important.

Project design

"Nothing is fix of what we are doing."

Main gist of this topic was that there is a conceptual difference between pilot and scaling projects, which is not reflected in the usual funding schemes. Some interviewees rather found that project research and funding would be "fundamentally in opposition to scaling".

Several projects mentioned that they would work in different phases, with a first phase focusing on technical and non-technical research, and a second phase dedicated to markets and policy dialogue. This was mainly the case with technology oriented projects. Other projects, often around Climate-smart Villages, citizen science and climate services, described how they "tested innovations as they were doing their research". These had generally a strong focus on initial and ongoing user- and stakeholder engagement, with the users' deciding "what was going to be scaled".

Here, some interviewees felt that it was really hard for researchers to get money from the donors for trying things out in the field, since these would prefer to fund research and

publishing, and rarely fund prototyping. On the other hand, user-centred methodologies were strongly recommended for future projects, especially in the digital domain.

With regard to preparation of scaling projects, active stakeholder mapping was mentioned as good practice to identify partners with legitimacy and mandate that could complement the project's work. Also the scaling mechanisms, e.g. distribution channels, would have to be checked and in place before impacting at large scale.

Projects with a strong focus on capacity building noted that there was a steep curve with intensive initial financial and human resources, which diminished in degree as the process accelerated and the partners took over the lead.

Another crucial ingredient of project design was the design of a hand-over strategy. Some projects (mainly technology based) did this rather at a second phase or end of the project, while others (approach oriented) used stakeholder engagement as a way to build in the hand-over from the very beginning. However, the biggest mistake in scaling was mentioned to be assuming that once the project is handed over to the partner, the work was done.

Important considerations here were that even as the policy or private sector partners take over, they will do their own pilot schemes before really going to scale, adapting and modifying the innovations to their own terms and conditions. To ensure design fidelity (or the "sanctity of research"), it was considered important that partners share the same vision, and that researchers continue to be close to the implementation for further advise. This will still require transaction costs that need to be covered.

Especially with regard to climate services, continued presence on the ground would still be key, which comes with its own set of challenges, e.g. with regard to the field work expenditures. Partners working on field level could be easily interested, but not be ready to take risks or to put money in. They have their own structures to subsidize. Possible negotiations could be to get services to these organizations for an add-on price, not striving to cover the full price of the ground agents. In turn, research projects often have the knowledge, but not the budget to equip farmers with the necessary material.

Theories of change were generally seen as too static. E.g. Government strategies and language would change fast, but theories of change were designed for three years. Although the vision/objectives would remain the same, projects would adapt the path on how to get there.

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Theories of change shall rather lead to circular project designs, supporting the understanding of connectedness and trade-offs, and provide spaces for learning from other projects.

Summary of findings on leveraging projects: *The incentive for uptake might not rest in one single project/solution*

The scope and duration of projects was in many cases cited as limited factor for scaling. Projects were dealing with this in different ways. One regional initiative on climate information would seek to always having a core project delivering the "building blocks". These would be knowledge, tools and mechanisms for scaling climate information in the different contexts. Aligned smaller projects would then support the scaling out to the different countries of the region. Here, the different projects would also have to accommodate e.g. spontaneous requests for support of other countries, or impact assessments from previous projects. Accordingly, the whole initiative shared one theory of change, written in an overarching way, and generating knowledge across the smaller projects.

A similar example researched the mitigation potential of different livestock strategies – initially without "scaling component". However, by the time this project ended, seemingly without impact, the previous engagement with policy makers, cattle associations and an NGO had already resulted in a business model based spin-off project. This new scaling project looked at the whole meat value chain and signed agreements with major supermarkets about preferential prices for meat with a low carbon footprint. This project now runs as joint venture between the CGIAR centre and the NGO, and under the umbrella of the Region of Colombia!

Textbox 2: Summary of findings on leveraging projects.

M&E for scaling

> *"As you scale the approach you also need to scale the monitoring."*

All projects recognized the need for solid evidence, with most projects valuing evidence not only as starting point, but at the different stages of the scaling processes. Checking the assumptions when scaling up was seen as crucial, as was evaluating pilots/projects before expanding to another place/stage. This and impact assessments should be part of project design. The generated evidence would then serve both as proof as for learning.

However, there was some ambiguity about the meaning of big numbers in the development context, which might result in situations that are "more about getting scale than impact." The welfare indicators that projects were using would depend on the respective programs' goals.

Interviewees found that measuring would be different for the different innovations or "products". Most agreed that an adequate M&E for scaling would contain quantitative and qualitative and progress indicators. Especially with regard to gender integration, several projects were not really sure about what to aim for and how to measure, although they found this topic increasingly important for their projects.

A shared concern was the attribution gap, since especially impact evaluations usually happen after the projects' end, and it was seen as difficult to measure impact after handing over to the next user. As one way for addressing the attribution gap it was suggested to give money to partners for evaluations, linked to analysing the different partners' contributions. Within financial or business approaches, measuring of impact was suggested to be more straightforward, since these sectors work with sales data and customer satisfaction and/or closely monitor their supply chain. In turn, the role of farmers in providing evidence and data was seen as more complex, since farmers would be stronger and more enthusiastic in experimentation than in collecting and storing data.

With regard to CCAFS internal monitoring tool, projects appreciated its (and the managements') flexibility on deliverables, but found this tool rather suited for monitoring than for evaluation. Oftentimes, the data would be entered by people that would not be aware of the projects' scaling processes and learnings. Several interviewees stated that the knowledge management for the CGIAR system could generally be improved, within or beyond MARLO.

Youth, gender and social inclusion

"How to translate the discourse into large scale and action?"

With regard to gender, youth and social inclusion the integration in project design and scope of action was very different for the projects, depending on their respective context. In some areas, decision makers were still mainly men, and it was difficult to meaningfully involve women. Other projects worked directly with women, or aimed to scale technologies in which women could play an important role (e.g. setting up and maintaining community seed banks).

Especially with regard to scaling, it was found that each scaling topic has its own specificities for women, youth and vulnerable groups, like e.g. ethnic minorities. There is a need to understand more about synergies, barriers and unintended consequences.

One project worked with a strong "do no harm" principle, e.g. taking into account women's work load and their voice in decision making. Since "things can easily go wrong" here, the project tests innovations on a small scale first and puts a lot more attention to the social science and behavioural aspects.

Another still critical topic was mentioned as being women's access to finance. Women's access to markets was seen both as a limitation, as also an opportunity. E.g. one project experienced that a scaled innovation provided such a salient business case for women that these entered the sector and therewith changed the traditional role of men.

Good practices were further to frame interventions in a way that they were important to women and for the next generation, e.g. to work with women at the nexus of climate change, gender and nutrition. With regard to risk management, it was found that women can actually be strong agents of change. One suggestion was to ask the key question: How can women help scaling?

With regard to youth, interviewees found mainly that this issue was still quite open, with the meaning currently determined from donors and development sides. They also found that this would need future work and probably social media and other digital engagement strategies. The main entry point was seen for connecting youth to markets, to generate income more quickly and to keep them interested in the agricultural sector.

Several projects saw youth as potential carriers for innovation, especially targeting them for digital approaches. One project directly focused on collaboration with universities in order to produce data mining start-ups by students, or internet communities for technologies, triggered by a lack of professionals in this sector.

The worst mistake in scaling, however, was said to be simplifying when striving for achieving scale. This would point to integrating "youth, gender and social inclusion at scale" into frameworks and projects in ways that would not require more resources and/or people's time.

Risk Management

"How to assess something unknown?"

Across projects, climate-smart agriculture technologies and practices are seen as risk-reducing measurements in the context of climate change, that are further very well researched for this purpose. As such, technical risks are well known, and large parts of the work are dedicated to assessing suitability for the different contexts before scaling.

Remaining risks are mainly interpreted as e.g. residual risks with regard to climate information and insurance schemes. Here, the best way to deal with it was considered to give farmers and next users transparent and complete information on potential benefits and risk areas. To help farmers in understanding the probabilistic nature that underlie climate services, projects invest in trainings with games and exercises.

Consideration was also given on how this uncertainty, and eventually "getting it wrong, which you will", would affect the projects' relation with the end users and institutions. This could be mitigated by stakeholder engagement and maintaining agency with the decision makers, which again would have to be reflected in the budget.

Risks in the sense of unintended consequences were hardly considered, although considered as quite important and relevant by some projects. One project actively pursued a "Do no harm" approach (see previous chapter). One interviewee cautioned to be careful about connecting farmers to markets. A second interviewee made a case for critical assessment of one's own capacities: "Before you give guidance, ask yourself: do I know where the bottleneck is and am I the right person to fix it?" A third interviewee suggested that this was probably a good topic to "explore explicitly with our co-development partners - this could be something that they hopefully would have had more thought about or experience than we have."

Another interpretation of risks was more a reputational one, directed to the perception of CCAFS/CGIAR as research organizations. Some interviewees felt that with the "tilt towards being more a marketing organization", at some points academic circles would not take them seriously anymore.

On the portfolio strategy side, it was mentioned that there was currently "a bit of a hype" with regard to apps, which still would need people working on the ground, and that sensor technique had the potential to bring a technological revolution in about three years' time, when this technology and the communication around it would become cheaper.

Opportunities for support

"Find a niche: where do we add value compared to existing networks?"

Coordination

While interviewees generally valued the autonomy and flexibility of CCAFS regional and flagship programs, some expressed that stakeholder coordination could still be improved, e.g. by providing access to the different projects' stakeholder networks. As good practice was also seen to set up regional or thematic stakeholder hubs with the respective expertise. On CCAFS global level, projects mentioned that they would benefit from a global mapping of stakeholder needs.

Projects also felt that they needed stronger commitments from donor sides, which could be addressed on CGIAR level by more strategically engaging with multi-lateral donors and national governments. However, it was found that there was a lack of strategic view and leadership in the CGIAR system that led to a significant reduction in CGIAR's political power.

Conceptual integration of scaling

Projects would appreciate conceptual guidance from the CCAFS Learning Platform on Partnerships and Capacity Building for Scaling CSA (LP6) in finding the most important leverage points for scaling, including guidance on economic assessment tools and market studies, and support in convincing the private sector to participate.

Some would further highly welcome LP6 to develop, introduce and promote applied research components, e.g. "prototyping formats for scaling". LP6 was also sought to facilitate access to and guidance for the use of scaling tools.

Evidence for scaling

There was a high demand among projects for support of LP6 or the CCAFS in general in providing evidence for scaling, both for proving and learning from the scaling processes. This

would also include to tackle the lack or scarceness of social & economic evaluations and long term monitoring of projects' impacts along the scaling processes.

The Knowledge Product Incubator: *"Because we are time bound and with limited resources ... we will use these better!"*

Currently, many research "products" are tailored to specific donor needs. There are missed opportunities to further adapt our research outputs to make them more widely applicable and more relevant to private sector partners. The Knowledge Product Incubator, developed by CIAT, focuses on existing knowledge products, which will be further tailored to private sector needs. With an additional 25% effort, the incubator aims to multiply the additional value from existing products by several times. This happens by making them more usable and accessible to next users (e.g. consultants, verification and other knowledge providers), who in turn would translate these into recommendations for private sector and commercial partners.

This new pilot project is an opportunity to understand development from an applied approach, leaving the conceptual debate and trying out something tangible. It will be a huge learning experience regarding the barriers for similar product development, e.g. how to identify high-potential knowledge products at CIAT, licensing, cost recovery, financing, contracting. Success would then be measured in terms of financial volumes (e.g. number of users who value the information service enough to pay). Pioneering a project, there is always a chance of failing: "If the incubator fails, then there is definitely not going to be any internal support for a second year of this kind of risk taking". But if it works, this could turn into a future source of funding to develop new products. After one year, the incubator will have established a method for ranking potential products based on technological readiness and interest from private sector, as well as identified best practices through the design and launch two prototypes. "Ideally, in 7 years, the approach of the incubator will be integrated into the way we think about project outputs, and the incubator will be gone".

There is an important opportunity to adapt the CCAFS research approach: Especially for decision support and digital projects, oftentimes the comparative advantage of different systems is less obvious and can be more related to accessibility: design features integration with existing information and value chains. Acknowledging this helps us to identify effective new distribution channels, e.g. "start-ups massively need novel info. We have lots of this …!"

Textbox 3: Case Study 1. The Knowledge Product Incubator (KPI)

Referring to evidence, some interviewees also mentioned that CCAFS might revisit the ownership of impact claims, since there might be some attribution issues between centres/projects, but also of CCAFS sometimes being perceived as "piggy backing" on centres' projects' achievements.

Knowledge management and learning

Most projects made a strong point that they would greatly benefit from more active learning from their fellow re-searchers and implementers. As one interviewee put it: "As an organization that is people-based, we are lacking internal feedback, and a targeted knowledge management."

This would include the improvement of learning and interaction between centres, relevant partners, and powerful external actors, but also creating learning platforms for and with farmers. CCAFS was considered to be suited for that for having a "perception of objectivity here, being an external force".

However, as one interviewee started "sharing itself is not difficult, but who will be in charge of that, and who funds this?" It was found that there is a need for some kind of framework to carry learning further than occasional sharing on CGIAR-organized events. On the potential role of communities of practice, some interviewees emphasized that these should be targeted and geared towards impact. Members would need a real incentive to participate, e.g. with relevant donors being part of the group: "You do not want to be in a Community of Practice and be alone …"

Communication was further rated as highly important, and one interviewee suggested to involve their communication officer in the learning platforms, for quicker sharing of discussion contents.

Advocacy, dialogue and narrative

Several projects stated that they would wish for more advocacy, open dialogue and narratives along some sensitive, strategic or critical topics related to scaling. One project had to overcome ideological counteractions from a national government, and would welcome dialogue and diplomatic support, for which CCAFS would be well placed, due to excellent communication.

Other areas where open dialogue would be welcomed were on risks and unintended consequences, and on the meaning of impact. As one interviewee stated, there were different ways of communicating impacts, "one for marketing and one being honest." It was felt that CCAFS could provide some "sense of reality" on this important matter.

Motivation

"This is something to be really proud of!"

When asked "what makes your work exciting?" most interviewees responded with spontaneous enthusiasm. Although the challenges at times felt overwhelming, nearly all were excited to create outputs with large impacts, and to see that they really contributed to change things, on the different levels.

Case study 2: IWMI's grid-connected energy solutions for farmers. *"CCAFS was very bold and brave to do that!"*

"In India, water subsidies had become a political issue and farmers strongly resisted any attempt to rationalize or to abolish these subsidies. The commercial energy sector was basically bankrupt. We were interested in finding a solution that would replace the existing perverse incentives into virtuous ones while preserving the interests of electricity utilities and farmers. We kept on writing papers, and kept adjusting and tweaking. Finally, we found a way how farmers could produce solar energy and feed the surplus in the grid – thus both decreasing grid dependency at peak times for irrigation, and introducing new revenue streams.

The idea was intuitively appealing in conferences, but nobody thought that this could actually be done. CCAFS then came in and they offered us 200,000 USD, to actually show that this could work on the ground. This was a very bold and brave thing to do! CCAFS fund gave us a lot of flexibility – most research grants are not designed to provide material, just staff time. So we created a functioning pilot case with 9 farmers. The real scaling then started after the Minister of Energy came, and talked to the farmers. He basically made it his own project, for gaining political mileage. By now, the local government already solarized 70 feeders and intends to solarize 3,000 more feeders in 2019. The national government has announced a 5 billion USD scheme, with a component of scaling out this pilot nationwide over the next 10 years.

"Help us to implement more ideas like this - give us more seed funding for prototyping! We love creating impact and getting credit for that. We have a lot of more ideas."

Textbox 4: Case study 2: IWMI's grid-connected solar solution for farmers.

One interviewee was excited by the growing recognition for diversity among research and development communities. Another interviewee described how "linking and understanding from local to intermediate to national levels created a "eureka!-moment for everyone". One researcher working with farmers described the moment in which one initially sceptical farmer turned into an active promoter, even before the workshop had ended. Others were thrilled by the sudden attention and credit of high level stakeholders and connected media exposure. One interviewee felt energized by "untangling the knot" and detecting possible avenues and leverage points.

Others were inspired by "making science actionable" and by seeing the shift in attitude of the scientists toward being implementers. CCAFS was credited several times for being an environment for innovation.

Systemic analysis

As a next step, these findings were screened and analysed with the perspectives of design thinking and system thinking to extract organizational learnings.

Design thinking perspective

Design thinking is a process for creative problem solving that places the user in the focus of product- or service development. Designing for users' needs, and combining this with what is technologically feasible and economically viable, increases the relevance of products and services, and their applicability and up-take by users. User-centred design is an agile and iterative process in which developers constantly test and improve their assumptions and prototypes in real live situations with the next- and end users (see figure 1). The review used the concept of design thinking to understand how users and stakeholders are engaged in the scaling processes of CCAFS' project portfolio.

User centred design principles in the CCAFS

The interviews revealed that CCAFS project staff already employed stakeholder- and user-centric approaches widely and in iterative ways. These were even identified as crucial learnings and key success factors for scaling. Generally, the reviewed projects were characterized by a strong user-focus and concentration on stakeholder needs, by using

iterative steps in "product" development and stakeholder engagement, as well as in project adaption and implementation.
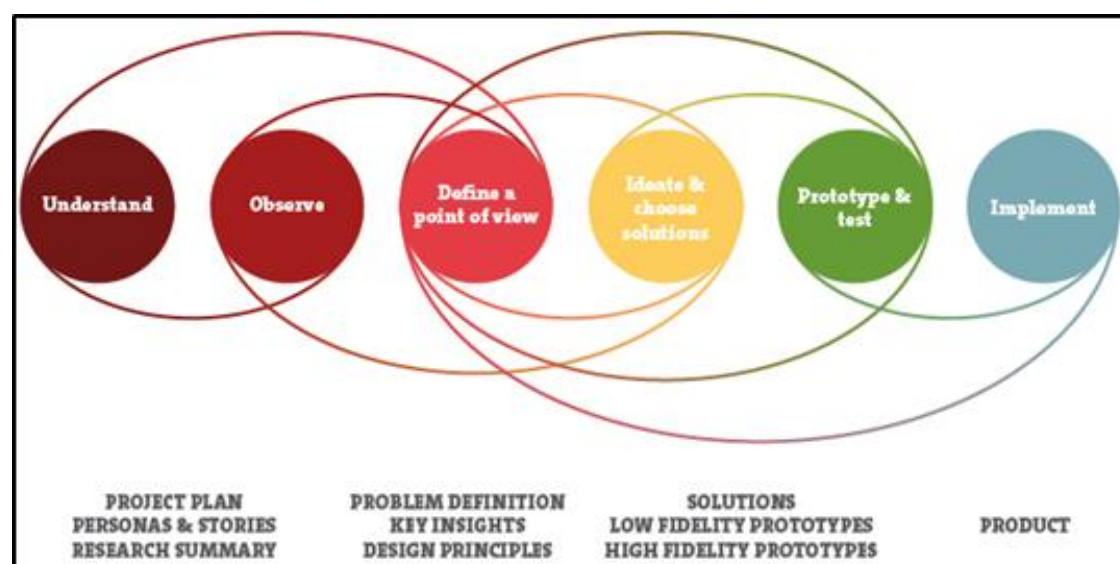

Figure 1: The process of Design Thinking, adapted from Institute of Design at Stanford
Theissen, A. H. 2019. Review of CCAFS Scaling Activities. Report.

However, projects found their progress often limited by the current structure, with regards to the initial project design, project duration and funding schemes, and found that there were missed opportunities in the knowledge management.

It was also found (more implicitly) that also on CCAFS management level, the use of the principles of design thinking could improve some of the offered formats. E.g., as one interviewee stated with regard to Learning Platforms: "I have to understand why this is important for me!"

The visualization of the iterative processes happening within CCAFS can also help projects to understand at which point of innovation development and scaling they currently are, and what support and next steps are needed.

System thinking perspective

The concept of systems thinking provides useful perspectives when working on wicked problems in complex dynamic systems. It presumes that wicked problems defy the classical logic of problem - solution, but rather are symptoms of an underlying system at work. A system is understood as an interconnected set of elements that is coherently organized for a

certain purpose. As a holistic approach, system thinking focuses on these interrelationships and patterns of change.

The review used the Iceberg-Model for analysis, with the hypothesis that people usually react to an event, which are taken as the cause for the reaction. However, these events are only the smallest part of an "iceberg". Observable patterns underlie these events, giving hints about the again underlying structures that evoked these patterns and events. These structures are supported, or kept in place, by people's mental models.
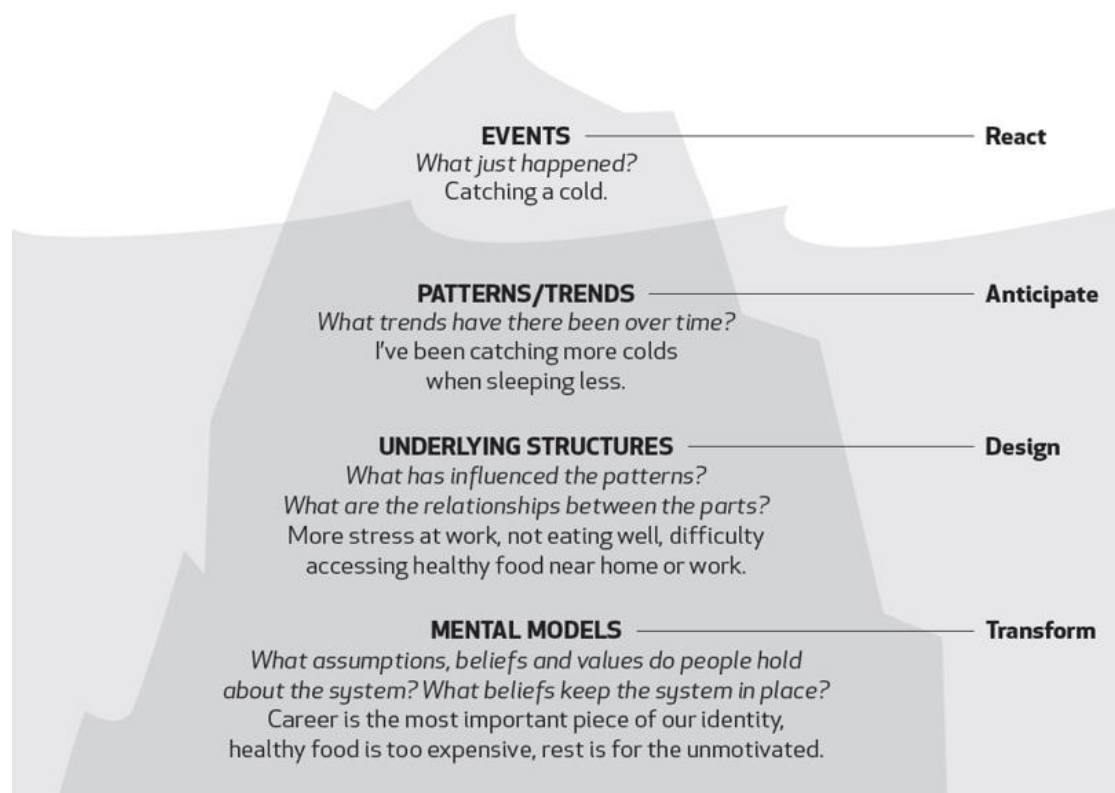

Figure 2: The iceberg model – a tool for system thinking
Theissen, A. H. 2019. Review of CCAFS Scaling Activities. Report.

CCAFS Scaling as a journey with different entry points

The review revealed a lack of clarity and consensus within the CCAFS portfolio about the meaning of scaling among the different projects. The donors' increasing demand that research shall contribute to the SDGs can be seen as an event that forces projects to react and to adjust. This can lead to projects seeing scaling as imposed numbers by donors. Some projects even distanced themselves from "scaling", although they actually worked very impact oriented.

At the pattern level, it was observed that many projects started with a certain premise, usually defined within the projects´ and institutes´ limits and scientific expertise, and directed to tackle the specific challenges that they faced or strived to address in the respective context.

"No matter what is the entry point, sooner or later we will have to address the other aspects, too."

When progressing to achieve impact at scale, at some point most projects were pushed to broaden their approach in order to reach their goal of scaling. To do so, they had to incorporate factors and applications from other domains, e.g. of social sciences (policy making, business models, marketing), and novel forms of cooperation. Many projects then experienced clashes with the underlying structures, e.g. with regard to project design, the needs for different sets of capacities, or inter-centre cooperation. In some cases, this also raised questions about the mandate of research. In most cases, projects expressed a strong desire to learn more from peers that experience the same or similar situations or challenges.
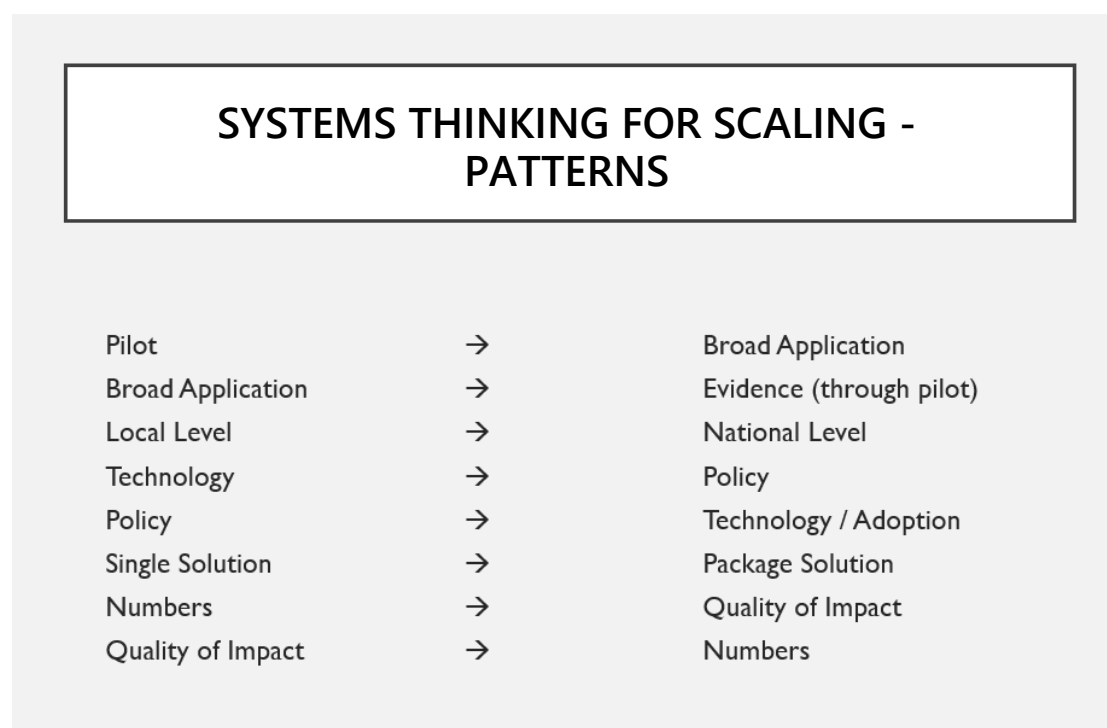

SYSTEMS THINKING FOR SCALING – PATTERNS

Pilot	→	Broad Application
Broad Application	→	Evidence (through pilot)
Local Level	→	National Level
Technology	→	Policy
Policy	→	Technology / Adoption
Single Solution	→	Package Solution
Numbers	→	Quality of Impact
Quality of Impact	→	Numbers

Figure 3: The iceberg model – a tool for system thinking
Theissen, A. H. 2019. Review of CCAFS Scaling Activities. Report.

The diagram in figure 3 shows a summary of the reported entry points of the projects, and the additional factors that they had to include during the scaling progress. This pattern reveals how entry points and "destinations" are complementing each other, but also points to the need to break these linear pathways of interventions. The concept of system thinking helps to understand the scaling processes as a journey on the same landscape, but with different entry points. This also opens the space for a more holistic management approach with regard to the portfolio, knowledge management and learning.

The scaling mind-set

At the level of mental models, interviewees found that they had started off as experts in their respective scientific research fields, often times unaware of the complexities and demands of scaling. The interviewees then described their own changes in their mental models, which during the process has made them more dynamic, flexible and resilient in responding to the challenges of scaling. They perceived their transformation from scientists to implementers and solution providers as highly exciting and motivating.

How is this useful for CCAFS?

This change of the researchers' mental model is ground-breaking and creates a unique fertile environment for impactful scaling, which can be leveraged across the CCAFS program. Researchers that worked with a scaling mind-set were very successful in a structure that by many is perceived as limiting. Examples range from working more efficient within the structure (e.g. by incorporating other centres' technologies into the scaled solutions), working around the structure (e.g. by scaling a solution in form of parallel and complementing projects) or even by working on the structure itself (e.g. by testing new ways of cooperation and funding).

> *"... our chaotic process is legit (design thinking) ..."*

The reviewed projects also showed how the application of the principles of design and system thinking at the different stages of innovation development and scaling can help to sustainably improve the work and impact of all projects across CCAFS portfolio: Designing and implementing projects with the principles of design thinking help to increase their relevance (needs-based, demand oriented), the iterative character helps to identify challenges and opportunities at all stages of the process (applicability, risk at scale, but also new uses, users

and partners), the scaling mind-set helps to ask the right questions (e.g. what would be a win-win-win solution?) and to act in an entrepreneurial way (e.g. seizing opportunities).

The review also showed the need for an open dialogue on strategic, sensitive or critical topics related to scaling. As topics, interviewees planted risks and unintended consequences of scaling, ideological discussions that have repercussions in partner governments' counteraction (e.g. about OPVs versus GMOs), and the strongly perceived tension between quantity and quality of outcomes. A strong shared narrative would provide guidance and also reassurance, ideally accommodating the different positions on quantity versus quality, sanctity of research versus innovations' adaptability, being a science or a marketing organization, to name just a few.

> *"The issue of scaling could be a piece of CCAFS, be of the whole CCAFS, or of the whole world of development."*

The new narrative on scaling can be seen as meta-concept for CCAFS, thus becoming a holistic perspective towards achieving broad sustainable impact. Asking the right questions allows the shift of the focus from problem orientation ("structure is limiting us") towards productive solution space. Introducing scaling as a meta-concept enables the organization to identify areas of improvement at all stages of project development and implementation. Instead of asking: "How can we achieve scale?" we should ask: "How can we improve our work through scaling?"

Organizational learnings

CCAF was already perceived by some projects as an innovation environment. This related mainly to being flexible, for "listening to what we are doing" and for having given uncomplicated seed funding for prototyping. CCAFS is further characterized by its highly motivated people working on a diverse set of highly relevant technologies. It has access to own or leveraged resources and excellent communication and recognition of powerful actors across all levels. This puts CCAFS in a great position to step up its scaling efforts and to accelerate the progress towards achieving the SDGs and the Paris Climate Agreement. Strengthening CCAFS role as an innovation environment can help CCAFS to remain efficient, relevant and competitive in the face of current and future challenges. This entails creating the capacities needed for continuous change among all levels of leadership and

implementation. It also involves developing and testing new approaches and formats that address current barriers for scaling, and that could serve as example and be leveraged across the CGIAR and the entire development community. Finally, CCAFS still has potential to improve and accelerate its learning and knowledge sharing processes.

Outputs of CCAFS Core Team Workshop on Scaling

The findings and learnings of this review were shared with the CCAFS Core Team in the frame of a Scaling Workshop in Madrid on 15th May 2019. In interactive formats, the Core Team gave management inputs and prioritized the areas for change. The following section summarizes each of these prioritized themes with their main discussion points:

Changing the criteria of success and use longer term (prize-based) stage-gates in projects

> *"There is a role for funding different types of effort, different modalities for different projects."*

One of the two main priorities was to explore how to design portfolios in a way that would incentivize participants' scaling activities ("going the last mile"), while at the same time managing donors' and stakeholders' expectations. Stage gates would allow to fund innovations at different levels of development and scaling. Projects' performance would be measured and evaluated for different criteria at the different moments or phases. Thus, more seed funding could be given to small projects, which could develop into big scaling, or be terminated timely, if they do not work (e.g. following the example of a challenge fund).

On the downside, there was the possible trade-off that stage gates could impose again a linear structure, while the strengths of many CCAFS projects was to work simultaneously at all levels, and to use feedback for iteration.

Changing the tone of dialogue of all users, engage partners that have the right know-how and social movements

> *"The discourse on scaling leads all project leaders to think about the same questions"*

The second of the two highest ranking priorities related to dialogue and partnerships for scaling. While was felt that the CCAFS' narrative on outcomes and impacts during the last 10

years had largely contributed to its success, there was still a need to integrate the discourse on scaling into this narrative, to reach also the remaining CCAFS scientists, other CGIAR research programs, and the wider scaling community. It was felt that the CGIAR had enormous power in changing world views ("even better than doing technology"). For example, the topic "finance" had been lifted within two years from discussions at farmers' levels to a priority theme with huge management support and "thinking big".

Further, the need for purposeful partnerships that go beyond superficial conversations was stressed, to improve project design, innovation and scaling processes. Since everyone had different assumptions about how scaling processes work, and what would be the entry points, continued discussions were crucial to revise assumptions along the way. Energy is set free when users, partners and stakeholders feel intimately connected, and all understand their respective needs, roles and responsibilities.

"It is about who owns the process. Who takes the decision on what to scale?"

It also depends on the type of partners, and their ownership, if the scaling processes or impacts continue after the projects' end. Sometimes, national policies might hinder partners to carry the process forward, other times CCAFS might influence the policies, but implementing partners, e.g. the private sector, still need incentives. Ideally, the "research supply" aligns to the stakeholders' agendas. Crucial are also partners with know-how on scaling, though again it is necessary to differentiate: "Some partners are good in piloting, some are complementary all the way through". Special efforts shall be made to explore engaging with social movements, since these are "going to define the next decade in terms of discourse".

Increasing risk-taking and enhance the willingness to fail

"If you take the bull out, you kill the innovation process."

A more innovative portfolio would also propose an approach and space to fail intelligently. Within an innovation ecosystem, projects are encouraged to increase their risk appetite, and to put aside some time and efforts for innovative ideas and activities that could lead to scale, knowing that those might as well fail.

One way to design projects that scientists really believe in, could be to string innovation with prizes. Also, CGIAR's performance standards would need to adapt, to reward people that "get fantastic outcomes and do iterative stuff with stakeholders!"

"Re-thinking projects, and being innovative about what to deliver!"

Some engagements with the private sector or finance institutions already turned the research process upside down. Although these partners often have the ability to design themselves, they still outsource, or turn to science to help to developing their ideas. While this approach poses challenging questions (e.g. "how far should we support private companies with public research resources?"), it also means translating or integrating research results into business models, which would make uptake easier.

Connecting the M&E process with the knowledge management process in order to provide ongoing learning

"Not learning to scale, but learning from scaling!"

It was felt that although CCAFS has a strong narrative on outcomes, there were no clear indicators or language around the scaling processes. These would help not only for monitoring, but also for communication (e.g. when wanting to benchmark CCAFS performance with other initiatives), and for learning: Different types of projects would follow different processes, thus the different phases of innovation development and scaling would need different sets of indicators.

It was found that the existing Monitoring, Learning and Evaluation (ML&E) system would provide great lessons. However, for better using these lessons, the knowledge management and learning cycles would need to be broadened beyond the ML&E system. For example, they could help to tell the story of how outcomes are the harvest of long previous project incubation processes, or they could provide guidance (e.g. in form of synthesis or webinar) on the possible implications when wanting to transfer successful innovation and scaling initiatives from one sector or country to another.

Conceptualizing and mainstreaming scaling elements in the project cycles

Scaling needs a vision shared by all key stake holders, and their commitment to invest time and efforts. Equally crucial are opportunism and quick responses to iteration needs. While the CCAFS' participatory research approaches (e.g. participatory breeding, participatory integrated climate services for agriculture), have much in

common with the bottom-up design thinking methodology, it was found that it was still challenging to integrate these principles into the daily project life.

"We need to be very clear about what kind of tool to use in which context."

Going through several iterations is not welcome or applicable in all situations. One major hindrance was that funders often do not understand or are not willing to provide the necessary time for social learning, prototyping and testing. Especially more upstream research outputs might get stuck if there is not market-based partner to lift them out of their early project cycles. For uptake of more downstream research, e.g. when co-producing climate services, it could be difficult for users to articulate their needs if they did not know yet what was possible. In the context of policy dialogue, the main messages could get lost in many rounds of iterations, since decisions need to be non-controversial). Finally, partners needed to be on board during the iteration process, otherwise they "might become suspect that one is using them as experimental." Especially when commercializing products, iteration processes needed to be finished, for not risking recalls, un-fulfilled orders and even getting sued. An example was given of the product "Golden Rice", which had to be recalled several times during the commercialization process, which caused problems for the traders and farmers that had placed orders and were left waiting.

Golden Rice was first prototyped, then commercialized. But it had not enough provitamin A. So they recalled and did a new line. There was a problem with the new line also, they had to do another line. People who at the other end had been waiting for the Golden Rice got burned. You can even get sued for that

"Scaling is not a straight line, we move within systems …"

Though most participants were cognizant about the complexity of the systems they were operating in, it was felt that system thinking was still applied in a way too simple to be useful for scaling. E.g. the respective best starting points would still need to be systematically identified. This would include questions like: Where are the biggest transaction costs that prevent seamless innovation transfer? What innovation or which situation is not suited for scaling?

"Can we achieve scaling in projects, or shall we better design programs?"

Although it was found that in most cases, the environment was favourable for investing more time on project design and implementation, there was still the gap for bringing innovations "to the final stage, the last part of the system". This could be improved by better hand-over strategies, including ways to promote sustainability after projects were finished. Another possibility was to reshape the portfolio, based on the scaling mind-set: Rather than trying to fit the constant iteration into the project cycle, trying to line up the projects towards the solutions – "aiming for an end-to-end solution".

This went back to the coordination of different projects, according to their stage and level of maturity, and to the responsibility of the regional program and flagship leaders, to cater for the continuity of the projects. However, it was not always clear "at which stage the projects and what the entry points are".

Conclusion

Based on the findings of the review and the prioritization of themes by the CCAFS Core team, CCAFS proposes to address the following programmatic areas to realize its vision of stepping up scaling efforts to accelerate progress towards the SDGs and the Paris climate agreement:

- Strengthen the capacities for innovation

This will include integrating the scaling discourse into CCAFS narrative and fostering the scaling mind-set, revising ways to reward success and entrepreneurial thinking.

- Create spaces for innovation development and scaling

This aims at providing safe spaces and making available time and resources to innovate, learn from failure, and develop funding and implementation formats that are responsive to innovation development and scaling. It also includes exploring exchange formats for peer learning and knowledge management for scaling.

- Provide guidance for scaling

This aims at developing a set of key questions, milestones and process indicators for the different types of innovations and the different stages of innovation development and scaling, for the purposes of providing evidence and generating learnings.

This also aims to integrate GSI and youth into scaling strategies, e.g. by including discussions on GSI and youth in the narrative spaces, with emphasis on risks and unintended consequences, as well as the potential leverage of women and youth for scaling strategies.

- Leverage partnerships for scaling

This aims at further expanding CCAFS partnership base, and involve existing partnerships in jointly addressing structural bottlenecks. CCAFS will strengthen existing and forge new innovative partnerships with actors that can fill existing gaps for scaling. Together with its partners, it will use its leverage with high level donors, policy institutions, decision makers and the CGIAR to advocate for developing formats, opportunities and solutions that can accelerate the transformation of food systems in a changing climate.

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