

# Research-development partnerships for scaling complex innovation: Lessons from the Farmer Business School in IFAD-supported loan-grant collaborations in Asia

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## ABSTRACT

The Farmer Business School (FBS) is a participatory, action learning process focused on product and business development, and like the Farmer Field School, is a complex, multi-dimensional innovation with the potential to benefit large numbers of farming households economically, socially and institutionally. Scaling this approach requires rethinking both innovation and scaling. The paper draws on the insights of recent research which argues that a systems approach to innovation can better address the complexity of scaling processes and provides frameworks that link together processes of innovation and scaling. In examining these frameworks, the paper identifies the key role of partnership dynamics in those processes. Drawing on both the innovation and scaling literature and literature on partnership dynamics, a conceptual framework is developed to analyze how partnership dynamics contribute to and constrain the transition from small-scale 'niche' innovation testing led by researchers, to large scale integration of the approach by development partners in agricultural 'regimes'. Using case studies involving partnerships between a small international agricultural research grant recipient and six large development projects supported by IFAD multilateral loans and managed by government agencies undertaken in four Asian countries between 2011 and 2018, the study analyses the variable dynamics of the partnerships from initial networking to integrated collaboration, in the process of scaling the FBS innovation. Responding to the main research question about the drivers of partnership dynamics that contribute to scaling, the paper examines the partnerships in terms of six drivers which derived both from the literature and also from the empirical evidence presented in the study. The drivers include two dimensions of "fit", one about the convergence of research expertise and development demand, the other about the systematic integration of the innovation with different elements of the development actions. Other drivers relate to the issue of the convergence of project cycles, the stability of staffing in partner organizations, internal decision-making processes and the dimension of "partnering" – the value-based and behavioral aspects of collaboration. The paper also discusses the results of a "partnership health check-up" process conducted periodically during the partnerships and reconsiders the driver about system fit to understand the extent to which there had been a transformation in the conventional 'regime' approach to innovations and scaling. Finally, the paper proposes to adjust the conceptual framework based on the analysis of these partnerships for scaling innovations.

## 1. Introduction

As increased attention is paid to scaling of technologies as a measure

of the impact of aid interventions (Picciotto, 2007; USAID, 2014), it has recently been argued that an innovations system focus can more effectively address the complexities of scaling, compared to considering

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scaling as a sequential, large-scale adoption phase following on from innovation (Wigboldus et al., 2016). Wigboldus et al. argue for a systemic view of innovation which is “integrative and interactive” and sensitive from early on to the multiple dimensions and levels of scaling processes and effects (ibid:3/4).

The framework used by Wigboldus et al. (2016), following Geels (2002), is known as Multi-Level Perspective (MLP). MLP aims to ensure that researchers and decision-makers are more aware of and responsive to the complexity of scaling agricultural innovations. MLP identifies three conceptual levels involved in technological transition. At the meso-level there is the “socio-technical regime”, where technology interconnects with mutually reinforcing areas of society such as markets, cultural norms, regulations and policies to create a degree of technological stability typified by “routine-based behavior” (Geels, 2002:1259). Technology change may occur, but this happens at a slow, ‘negotiated’ pace, with orthodoxies constraining change. In an example of agricultural regime, stability prevails around the use of common crop varieties, which is reinforced by farmer practices, seed and marketing systems, and public sector regulations routinizing and constraining research on and release of new varieties. At the micro-level there are “protected niches” where more radical testing and piloting of alternative technologies and practices occur, freer from the routine-based behaviors that characterize the regime, but with no guarantee of creating socio-technical transitions within the regime. Continuing the agricultural example, protected niches may involve participatory testing of multiple varieties. At the macro-level there is the “landscape”, which is conceptualized as the broader ecological, demographic and geo-political context within which a regime exists, and which may contribute to greater rigidity, or sometimes offer new opportunities, at the regime level and influence niche activities. While changes at landscape level are mostly slow (e.g. urban migration processes), sudden changes which may influence changes at regime level can also occur (e.g. a large influx of refugees requiring a reorientation of agricultural activities).

MLP can help focus on the interaction between niche, regime and landscape level dynamics, and especially the processes that influence whether technology scales beyond the niche level and contributes to systemic change. Muilerman et al. (2018) applied the approach to examine the failed efforts to scale cocoa farmer field schools (FFSs) from project level (niche) to the agricultural regime in Cameroon. The authors underline the importance of a multi-dimensional and dynamic systems approach and identify two key reasons for failure which are of particular relevance for the present study. The first one relates to the close relationship between the characteristics of an innovation and the scaling process. FFS, according to these authors is “both a model and a means”, in other words, an innovation that is both a technical protocol and also a means for farmer empowerment through adult education and institutional strengthening. A lack of understanding of this multi-faceted characteristic among regime partners involved in scaling and a tendency to hold on to the technical protocol dimension contributed to failure. The second reason relates to partnership dynamics, including limited discussion time and sharing of perspectives among partners and a lack of sensitivity to, and understanding of, the characteristics of the prevailing agricultural “regime” within which partners were embedded. In their study, Muilerman et al. (2018) focused on social dynamics, scaling and management. Partnership dynamics were not directly part of the analysis. Yet a key element of taking niche activities to regime level involves collaborative relationships between multiple actors, some of whom are involved in “niche” research, some others in projects and programs being implemented within “established regimes” of development.

Drawing on six case studies undertaken in Asia between 2011 and 2018, the present paper analyses efforts for scaling Farmer Business Schools (FBS), a similarly complex and potentially transformative innovation as is FFS. The paper examines the research-development partnership dynamics at the center of the scaling process and the

‘drivers’ of those partnerships, with a focus on the factors that facilitated collaboration between a research team focused on piloting the FBS innovation (niche) and public sector agencies in charge of implementing large-scale rural development projects, involving primarily investment in infrastructure, technology extension, marketing and micro-finance.

After reviewing some of the relevant literature on innovation, scaling and partnerships a conceptual framework drawn from this literature is presented in Section 2. Section 3 describes the institutional and geographical background to the case studies and the methods used to collect and analyze data about them. The results are presented in Section 4 and discussed in Section 5. Finally, Section 6 presents the conclusions and proposes a revised conceptual framework for future application in similar research work.

## 2. Innovation, scale and partnerships: towards a conceptual framework

The previous section discussed the importance of bringing a systems perspective to the issue of scaling agricultural innovations. Systems thinking in agriculture has been of growing importance in recent decades, leading to changes in the meaning of “innovation” (Clark, 2002; Röling, 2009) and as will be seen, also of scale. Post-war thinking about linear “development” and take-off (Rostow, 1960; Rist, 2014;) led to the establishment of “centers of research excellence” for the delivery of innovations to farmers via extension systems (Leeuwis and van den Ban, 2004). Starting from the 1990s, with an intensification of debate around the value for money of aid (Casson et al., 1994; Riddell, 2008), “scaling up”, “scaling out” and “going to scale” became of increasing interest in different sectors (Edwards and Hulme, 1992; Gonsalves, 2001; Pachico and Fujisaka, 2004), some implicitly depending on a linear delivery of larger and larger impacts. Picciotto (2007:358) identifies three scaling paradigms during this period: a hierarchical paradigm, depending on strong project or public sector leadership to push the process along; an individualistic paradigm, where scaling is supposedly driven by incentives, and a relational paradigm where scaling depends on experimentation, social learning and networks.

More recently these paradigms have converged into a new thinking about innovation which recognizes that there are multiple actors and sources of agricultural knowledge and innovation. With different emphases and evolving formulations, many scholars argue that developmental change occurs through the interactions between these actors – both individual and institutional (Biggs, 1990; Röling, 1992; Woodhill and Röling, 1998; Engel, 1997; Biggs, 2008; Schut et al., 2016). Institutional actors such as government agencies are part of the innovation system and can contribute the knowledge and expertise to help shape and scale innovations (Biggs, 2007). The concept of innovation systems emphasizes that within specific contexts, innovation and scaling are organically connected rather than sequential events in a pipeline (Lundvall, 1992; Hall et al., 2004).

The ideas of relational scaling and the issue of social learning among multiple actors underline the importance of partnership in these interconnected innovation processes. We understand partnership in the context of agricultural innovation as a “sustained multi-organizational relationship with mutually agreed objectives and an exchange or sharing of resources or knowledge for the purpose of generating research outputs (new knowledge or technology), fostering innovation and facilitating development outcomes” (Horton et al., 2009:13). Many scholars cited in the Horton et al. literature review note that cross-organizational agreement on common objectives and outputs, and ways of sharing, are not static. Partnerships are almost always dynamic, ranging from very loose affiliations to almost seamless integration of identities (Kitzi, 2002; Bezanson et al., 2004; Gajda, 2004). The common collaboration phases identified by these authors involve an initial loose “networking” followed by some level of coordination or complementarity of activities, sometimes also described as “cooperation”,

which is followed by a more integrated level of “collaboration”.

Nevertheless, the partnership aspect of innovation and scaling has received limited attention (Brouwer and Woodhill, 2015), and sometimes considered of minor importance (Hartmann and Linn, 2008). Horton et al. (2009) identified literature in the field of science and technology policy that makes the link between partnerships among researchers, policy makers, and economic actors and successful fostering of innovation. This includes Hocdé et al. (2006) who propose guidelines to improve the design and conduct of research projects that aim to foster innovation through partnerships among multiple actors. Hall et al. (2001) identify a wider range of organizations involved in innovation processes than is assumed in public sector research and use the concept of a ‘national innovation system’ to argue for a partnership approach as a core methodology for addressing innovation. The paper concludes that: “partnerships in technology development are important because of the benefits in innovative performance derived from productive relationships between those organizations engaged in formal research and those engaged in the use of new knowledge in economic production” (ibid:21). Other literature focused on the issue of managing the “boundary” between research organizations and policy or development stakeholders as the multiple situations and collaborative arrangements that exist at their interface evolve over time (Cash et al., 2003; McNie, 2007; Kristjanson et al., 2009; Schut et al., 2013; Garb and Friedlander, 2014).

Building on these insights, we argue that partnerships are key elements in the integrated concept of innovation and scaling, requiring understanding and alignment of approaches to innovation and the scaling goals of different partners. Partnerships also need to identify and overcome challenges, including for example the frequent rigidity of bureaucratic structures which individual partners need to negotiate as part of change processes. These structures often tend towards “better of the same” solutions and to the routinization of technological innovation at regime level described by Geels (2002) rather than supporting more fundamental system or institutional changes required for scaling innovation (Pritchett and Woolcock, 2004:198).

The literature discussed in the introduction illuminates the different conceptual and spatial levels that are involved in scaling innovations, from the mostly local and protected space of niche or pilot experiments to the broader physical, economic, socio-political and cultural milieu of the development “regime” in a particular country, which itself occupies a space within a national and international “landscape” of social movements and macro-economic trends constraining or supporting scaling efforts. This underlines the importance of unpacking the multiple aspects of scaling that need to be considered by decision-makers across several broad dimensions from the bio-physical environment to cultural capital. Drawing on these insights and on the partnership literature we developed a conceptual framework to analyze the dynamic nature of research-development partnerships for scaling (Fig. 1).

To conceptualize partnership dynamics, we need to recognize that partnerships do not fall from the sky fully formed but are mostly initiated through some kind of networking (Kitzi, 2002; Bezanson et al., 2004; Gajda, 2004). In this paper, we are concerned with the dynamics of research-development partnerships for scaling which involve different levels of proaction by partners at different stages. At the early stage, there is more initiative required from the researchers who often need to act as “boundary agents” to facilitate innovation and sustainable scaling among development partners. This can involve communicating or even translating research results and findings into terms more accessible to those working within the prevailing development discourse of particular sectors (Klerkx et al., 2012). At this stage, there is more proaction by the research partner than the development partner. This is schematically indicated in Fig. 1 by the inverted trapezoid, representing the more substantial actions of the innovation niche research partner early on, and also by the positioning and size of the collaboration arrows, indicating greater “ownership” of the limited collaboration by the research partner in the first two stages of the

partnership.

A key element of the networking concerns exploration of the “fit” between the prospective partners. The notion of “fit” was first elaborated in the business and organizational literature (Özgediz and Nambi, 1999) to refer to the degree of coincidence of interests and goals and complementarity of capacities between two organizations and also the compatibility of less tangible elements such as culture and values. The term has been used in extension science to capture the idea of adaptation (Shiferaw et al., 2009) and in recent scaling literature which emphasizes that scaling involves looking at the new contexts as an iterative and learning process (Farrow et al., 2016; Wigboldus et al., 2016). Both senses of the term are relevant within the proposed conceptual framework, as an indicator of the potential for collaboration and a signpost for the scalability of the innovation around which the partnership is formed.

The second stage of partnership involves a shift towards greater coordination between the partners and a synchronization of their separate activities. For a prospective research-development partnership, the needs and demands of the potential users of proposed innovations have to be recognized, especially through their participation in knowledge generation and validation which contributes to empowerment (Hocdé et al., 2006). Different kinds of scoping activities can be conducted by researchers at this stage, with facilitating actions undertaken by development regime actors, including for instance participation in multi-stakeholder feedback meetings in response to findings. Trust has been described as the ‘glue’ that holds partnerships together (Özgediz and Nambi, 1999) and building trust is a key component of early stages of scaling partnerships, itself dependent on building personal relationships and on the stability of staff across organizations.

As the partnership moves towards cooperation, there is a stronger focus on identifying the mutual benefits of joint participation in the innovation process and on developing a framework for this, possibly involving more formalization of the relationship. This is where piloting becomes more like “incubation” of a high potential innovation, with expectation of expansion (Hackett and Dilts, 2004). At this stage, there is some resource sharing, greater accountability and the beginnings of thinking within the regime about the innovation.

The final stage of the research-development partnership dynamics is “collaboration”, also described as “critical partnership” or “merging/unifying” by some writers. This is characterized by pooling of resources and sharing of risks, and by full “buy in” to the innovation by the regime. At this final stage scaling is driven by the regime.

This conceptual framework allows us to analyze partnership dynamics between researchers and development practitioners involved in scaling a complex innovation like FBS from niche testing into a new, mainstreamed practice at the level of the development regime. It will also help be sensitive to transactions and other costs of partnerships, among other disincentives. These include mutually negative perceptions between partners, and high levels of competition and risk associated with assets involved in the partnership (Spielman and von Grebmer, 2006). The notion of ‘collaborative inertia’ has been coined to describe poor collaborative performance resulting from the many factors that make partnerships difficult (Huxham and Vangen, 2005). These authors also coin the term ‘collaborative advantage’ to describe the situation where benefits of collaboration outweigh the frequent challenges.

Several scholars have attempted to identify the factors or ‘drivers’ that contribute to a successful partnership (Horton et al., 2009). Caplan et al. (2007) argue that drivers of partnership can best be considered across three dimensions. External drivers refer to the political, socio-economic, and cultural conditions and rules regulating the arena in which the partnership is operating, and which may favor or hinder partnerships. Organizational drivers include the visions, missions and skill sets of particular organizations involved in the partnership, which determine incentives and obligations to partner. Individual drivers include the professional and position identity and motivations of the

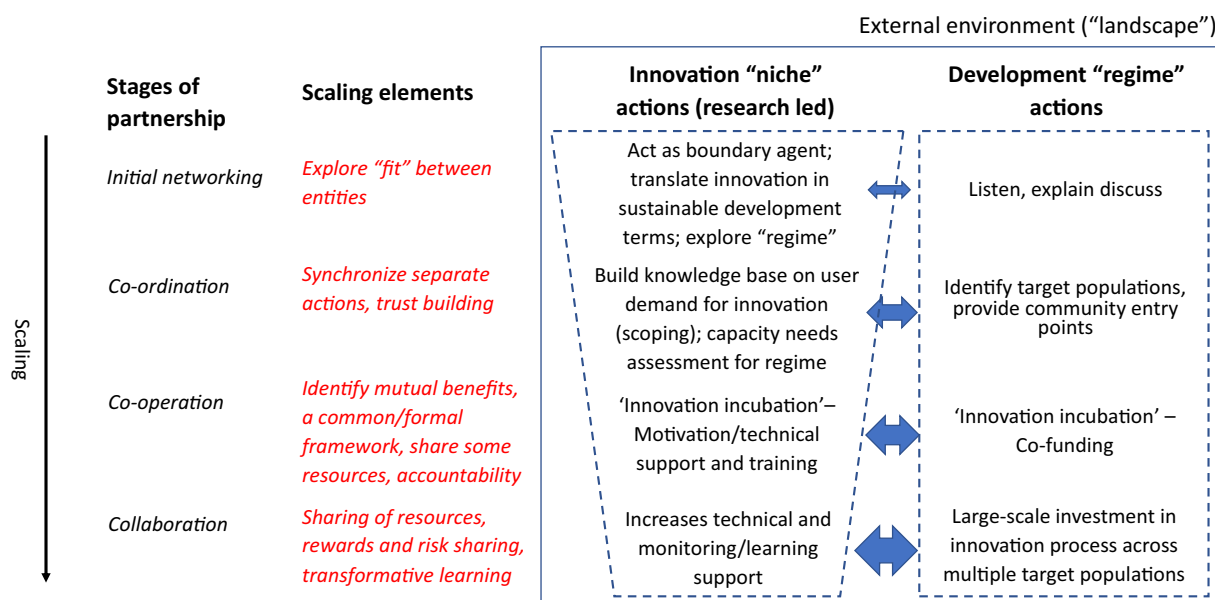


Fig. 1. Research-development partnership dynamics in scaling agricultural innovations.

people actually engaged in establishing and operating the partnership, especially their incentives and disincentives. Tennyson and Harrison (2008) identify realistic organizational drivers by considering what they describe as ‘endearing myths’ of partnership and contrast them with ‘enduring truths’. They emphasize as a driver for example the complementarity of what partners bring to the table and also the presence of a fluidity of partnership structure that favors innovation and the uptake of new ideas and opportunities. In relation to external drivers, they mention that partnerships can benefit from external inputs and interventions, such as funds from a donor or facilitative interventions from outside (for example the role played by IFAD country offices in strengthening the partnerships discussed in this paper).

For individual drivers, the notion of mutuality is important. Mutuality refers to the inter-dependence, mutual commitment, rights and responsibilities and ‘value–balance’ and is a recognition among individual actors that the partnership offers opportunities which are greater than can be achieved by their own individual organizations or projects (Brinkerhoff, 2002). Rose and Wadham-Smith (2004) consider mutuality “a closely interconnected set of values” held among partnership actors (2004: 11).

If partnerships are key for taking innovation to scale and drivers are important determinants for their success or failure, our central research question for this study is: what factors or drivers account for the ability of research-development partnerships to progress through the different stages of collaboration involved in scaling a complex innovation like FBS?

### 3. Context of the research, materials and methods

#### 3.1. Context

The innovation discussed in this paper is the FBS approach. FBS comprises a series of farmer group-based experiential learning activities with trained facilitators over a production-marketing cycle, usually of 8–10 months (CIP, 2017). The methodology involves farmer groups themselves directly undertaking market assessments and taking the lead on product development for exploiting the identified market opportunities. Participants interact during the cycle with other chain actors and stakeholders such as traders and service providers. The process culminates in a final business launch, with opportunity for FBS groups to promote the new businesses and products developed through FBS to

consumers, retailers, government agencies, and other stakeholders. Although FBS has been developed for use with root and tuber crops (RTCs), it can be applied to any commodity. FBS, besides aspiring to a more profitable pro-poor farm business through innovation in marketing, enterprise and pre- and post-harvest technologies, it also seeks to empower men and women farmers, enhance trust, coordination and collaboration between farmers and other chain actors and thus ultimately contribute to sustainable livelihoods of targeted households. In this sense it is both a technical model and a means to social transformation, in a similar way that was identified for FFSs (Horton et al., 2013; IFAD, 2014; Muilerman et al., 2018).

Socio-economic change can occur through social learning with fellow farmers, project facilitators and other staff, through the empowerment process and through new types of engagement with value chain actors, translating into increased market sales. Institutional change occurs in the interaction and co-production of new knowledge among researchers, implementing agencies staff, local district staff, and farming communities and households. But FBS can also be a technical model involving new knowledge and practices related to new varieties and planting materials, new product development techniques and marketing arrangements.

This paper explores the way partnership dynamics and partnership drivers contribute to scaling a complex innovation like FBS. It focuses on multi-lateral and national public sector research and development collaboration using case material from the partnerships developed between an IFAD regional research grant project in Asia with six national development projects supported by IFAD through large-scale loans to public agencies (investments).

IFAD manages investment projects through country programmes and the projects are developed in line with country development plans. These IFAD investments aim to leverage complementary funds from relevant government agencies, other multi-lateral organizations (e.g., World Bank) and beneficiaries themselves. Projects typically fund rural infrastructure (roads, irrigation), and livelihoods, including value chain development for targeted commodities. Investment budgets range between US\$25–200 million, 30–80% of which is funded by IFAD loans.

As part of its mandate “to increase the knowledge base on proven solutions and good practices, and strengthen food security” IFAD manages a separate, much smaller funding stream to provide grants to research partners to generate “evidence to feed into IFAD operations” (<https://www.ifad.org/en/research-and-academic-institutions>). Grants



may be global, regional or country-specific. Although most grants are designed, implemented and monitored independently of the investment projects, there is an expectation that results of research grant activities can subsequently be scaled up through IFAD's country programmes, investment projects and by other stakeholders. In this regard, the IFAD country strategy (Country Strategy Opportunities Programme or COSOP) is key to identifying areas and topics where research efforts can be valuable for investment projects as part of IFAD's institutional commitment to going to scale.

However, being a match-maker does not guarantee a marriage. The degree to which IFAD investment and grant projects interact to achieve innovation scaling depends on their capacity to collaborate. This paper specifically analyses the dynamics of grant-investment partnerships as a process of scaling a complex innovation – FBS – for the benefit of large numbers of low-income rural households in Asia. We focus on grant-investment partnerships involving FoodSTART, an IFAD-funded research grant led by the International Potato Center (CIP), and six large investment projects between 2011 and 2018. FoodSTART aimed to provide evidence, methods and innovations to enhance the contribution of RTCs (mainly sweetpotato, potato and cassava) to food security, resilience and livelihoods through these partnerships across Asia. The first partnerships with IFAD investment projects were developed during the first phase of FoodSTART (2011–15), especially with one project in the Philippines (CHARMP2). Based on this positive experience, the second phase of FoodSTART (denominated FoodSTART+, 2015–2019<sup>1</sup>) was specifically designed around building R&D partnerships for scaling innovations with investment projects in the Philippines (INREMP and FishCORAL), India (LAMP), Indonesia (SOLID) and Vietnam (SRDP). Basic information about these investment projects, including their geographical settings and the role of RTCs, is provided in Table 1. Guided by the priorities of these investment projects, FoodSTART adopted FBS as innovation approach to achieve sustainable change throughout RTC value chains and in the broader agri-food system with the possibility of spill-over to other commodities.

### 3.2. Area description and arrangements

Cognizant that transparent governance, regular communications and responsive decision-making are critical ingredients for successful collaboration, FoodSTART strategy was to hire liaison staff to be located in as close proximity to the investment projects as possible. Their exact positioning mainly depended on the spatial characteristics and arrangements of the different projects. Both India and Vietnam have federated political systems with significant devolution of power to provincial level.<sup>2</sup> The two investment projects in these countries, LAMP and SRDP respectively, are targeted and managed at provincial level. In these cases, “embedding” was the preferred option, with staff located in investment project offices.

During the first phase of FoodSTART, liaison with CHARMP2 in northern Philippines was handled directly by the CIP project office in Los Baños, which had good access to the project sites. In the second phase, the presence of two different investment projects spread across multiple islands and the important oversight role of regional directors,<sup>3</sup> led to a decision to locate the liaison staff at the Rootcrops Research and Training Center in central Philippines, an existing research partner of FoodSTART that had reasonable access to the island sites of both INREMP and FishCORAL. We refer to this as the “neighborhood” option. As senior project managers of both investment projects were in the

<sup>1</sup> For the purposes of this paper, we will refer generically to FoodSTART as a grant project running between 2011 and 2019, unless we need specifically to discuss particular phases of the project.

<sup>2</sup> In India, the provinces are referred to as States.

<sup>3</sup> In Philippines, there are 17 administrative Regions each of which are divided into several provinces.

**Table 1**  
IFAD investment projects: basic information.

Investment project	Implementing agency	Duration	Main objectives	Budget (% IFAD)	Project area (and niche locations <sup>a</sup> )	Role of RTCs
Cordillera Highlands Agriculture and Resource Management Project Phase 2 (CHARMP2)	Department of Agriculture	2008–2015 (extended to 2019)	To reduce poverty and improve indigenous farming livelihoods by improving land tenure, food security and watershed conservation.	US\$52 M (52%), later increased to US\$76.8 M	Cordillera Administrative Region, Philippines (selected highland communities)	Important food and income source in the location
Fisheries, Coastal Resources and Livelihoods Project (FishCORAL)	Bureau of Fisheries and Aquatic Resources	2016–2020	To reduce poverty, improve food and nutrition security and increase incomes in coastal and fishing communities through sustainable resource management and livelihood diversification.	US\$43 M (70%)	Coastal areas in central and southern Philippines (selected sites in E. Visayas, ARMM, Caraga)	Sustainable livelihood options and alternative to focus marine resources (fish, seaweed)
Integrated Natural Resources and Environmental Management Project (INREMP)	Department of Environment and Natural Resources	2013–2020	To improve condition of watersheds and increase rural household incomes	US\$148.6 M (13% IFAD; 68% ADB)	Four river basins Philippines (selected sites on Bohol island)	Traditionally important for the targeted remote forest dwelling communities
Livelihoods and Access to Markets Project (LAMP)	Meghalaya Basin Management Agency	2014–2022	To improve household incomes and quality of life in rural hilly areas through expanded and sustainable livelihood opportunities.	US\$169.9 M (30%)	Meghalaya State, India (selected site in E Khasi Hills and W Garo Hills districts)	Widely and traditionally grown for food security. Potato a major cash crop
Smallholder Livelihood Development Project (SOLID)	Food Security Agency	2011–2018	To reduce poverty and improve food security and incomes in rural communities.	US\$65 M (75%)	Maluku and N Maluku provinces, Indonesia (selected sites in E Seram and S Halmahera districts)	Basic staples in both districts (especially cassava and sweetpotato)
Sustainable Rural Development Project (SRDP)	Provincial People's Committees	2013–2018	To sustainably improve incomes and reduce vulnerability of rural poor households.	US\$46.2 M (52%)	Ha Tinh and Quang Binh provinces, Vietnam (selected sites in Quang Binh)	Cash-crop in upland areas (cassava) and important for food security in coastal zones (sweetpotato)

<sup>a</sup> Localities where initial testing of innovation undertaken.

national offices in Manila, a senior FoodSTART staff based in the nearby CIP office supplemented the neighborhood liaison staff in coordination and decision-making.

In Indonesia, SOLID targeted two remote provinces in eastern Indonesia, but the management of the project was located in Jakarta. A “neighborhood” option was adopted with respect to the management offices, as an initial strategy, until local government staff were appointed by SOLID as “designated staff” for the partnership.<sup>4</sup>

### 3.3. Methods of data collection and analysis

The methods of data collection used in this study were mostly qualitative, involving collection and review of secondary materials, holding and documenting face-to-face meetings and requesting written assessments from stakeholders, including a scoring system for aspects of the partnerships.

Important secondary materials consulted were the IFAD-led COSOPs for the target countries. These documents present an analysis of the agricultural sector and rural poverty and provide a set of geographic and thematic priorities to guide elaboration of investment proposals in each country (IFAD, 2017). The second key set of secondary documents were the design documents of each targeted investment project. Additional material included the documentation of the initial exchanges and actions of the collaboration which occurred following the tentative selection of the investment project as a prospective partner, based on the COSOP, the design document, the intermediation of the IFAD country office, and networking meetings with the teams implementing the investment project.

Further information on the partnership dynamics were generated through an initial Launch and Planning Meeting attended by all the investment teams to present preliminary results of scoping studies and to discuss their visions for future collaboration. A further two mid-project review meetings were held for all investment projects to facilitate assessments of the partnerships and progress towards scaling. At these same meetings a “partnership health check-up” tool was applied to generate both qualitative assessments from the different stakeholders and also scoring against set partnership criteria (see Annex 1).

This study also drew on an assessment of the partnerships carried out by an IFAD Supervision Mission, primarily interviewing individuals and listening to presentations and discussions.

During the second mid-project meeting, the “partnership health check-up” tool and the Supervision Mission written assessment were complemented through a structured round-table discussion, involving different categories of stakeholders (FoodSTART+, target investments and IFAD staff, respectively) responding to the same set of questions about the dynamics of the research-development partnership.

The quantitative and qualitative information were organized, collated and compared through the key aspects of the conceptual framework presented in Section 2 and, in particular, the partnership stages and dynamics at the center of the scaling process, and the drivers of those partnerships. Preliminary findings were discussed in a small workshop held in Manila in November 2018 involving FoodSTART senior staff and technical advisors. The main results were then presented, discussed and validated with senior management of the investments projects.

## 4. Results

This section describes the interactions between research and development partners involved in scaling FBS throughout the four different stages of partnership presented in the conceptual framework. For

<sup>4</sup> The option of a designated staff to liaise between FoodSTART and the investment project was also taken up in LAMP after the sequential departure of two embedded FoodSTART staff.

each stage the key scaling elements and drivers of partnership are highlighted. Furthermore, the actions of researchers (in relation to niche activities) and of staff of development agencies (in relation to regime activities) are described. A final part of this section presents results of partnership monitoring and learning.

### 4.1. Initial networking

Early interactions during the networking stage identified in Fig. 1 between FoodSTART and the investment projects involved discussions by senior FoodSTART staff with senior managers and subject-matter leaders of the investment projects for exploring a common vision and purpose for the collaboration. Was there a “fit” between the organizations? A key element accelerating recognition of fit was whether the research skills and innovations clearly addressed demands of the investment project and its beneficiaries. In some of the meetings the project staff also wanted to know about the mode of collaboration, the sensitivity to gender issues and these were part of an understanding of institutional values. FoodSTART staff explained that they offered expertise in RTCs, so the opportunity for building partnerships to achieve scaling for impact depended to a large extent on an already existing recognition of the relevance of RTCs for the investment projects, or the possibility of demonstrating a relevance which had been overlooked. Staff also explained FoodSTART's thematic expertise in FBS, emphasizing its comprehensive, multi-dimensional approach to poverty reduction and food security through better integration of producers in agricultural value chains and the development of their entrepreneurial skills. FBS was introduced as commodity neutral approach which, although originally developed for RTCs could be applied to other commodities. So early interaction with investment projects involved identifying an existing or potential demand for RTCs and an interest in strengthening value chains.

The relevance or potential relevance of RTCs were discussed in initial networking meetings with investment projects. Despite RTCs being important commercial and/or food security crops in all sites, only three out of six projects recognized this in their design documents (Tables 1 and 2), and this influenced the conversation about ‘fit’. Arguing that the initial design may have underappreciated the relevance of these crops for the investment project goals, all of which highlight poverty reduction, reduction of vulnerability and strengthening food security and income, the FoodSTART team offered to address this possible gap between project design and local commercial or food security opportunities offered by these crops through a scoping study to provide more details of the characteristics, roles and relevance of RTCs in the target geographies. The study, to be funded by FoodSTART although involving the contribution of information and logistical support from the investment project, was proposed as an act of good faith, part of the negotiation and early dynamics of the partnership to explore and possibly improve the “fit” between the organizations and enable a move to a closer, more trusting relationship.

In the case of LAMP, potatoes are an important cash crop for small farming households throughout Meghalaya (the Indian State targeted by LAMP). Although potatoes were recognized in the design, more information was needed on specific farmer needs and demands. On the other hand, other RTCs were underappreciated and not included in the design, even though the State is a center of genetic diversity for crops such as taro. The scoping study showed that these crops were central to food security in some localities and were then included as priorities by the investment project (FoodSTART+, 2016a). Neither FishCORAL nor INREMP included RTCs in their priorities and their aquatic and forest conservation orientations respectively meant that RTCs were not recognized as part of local livelihoods. Nevertheless, the staff of both projects expressed interest in having more information about these crops and for both projects the scoping studies showed the importance of RTCs in local food systems, especially contributing to food resilience under frequent extreme weather events in the area (FoodSTART+,

**Table 2**  
Relevance RTCs in IFAD investment projects.

Project	RTCs in project design	Scoping study	Main partnership activities
CHARMP2	Several RTC options identified during participatory village planning	Role of RTCs in livelihoods and nutrition documented	FBS for cassava, sweetpotato, yam and taro; RTC nutritional awareness building; knowledge products
INREMP	None	RTCs importance in agroforestry systems	FBS for sweetpotato and forest products; resilience study; knowledge products
FishCORAL	None	Cassava and sweetpotato for alternative livelihoods in coastal areas, and typhoon resilience	FBS for cassava and marine products; resilience study; knowledge products
SOLID	Minor role for cassava as local food crop option	Importance of cassava and sweetpotato in diet; cassava flour potential	FBS for sweetpotato and cassava; testing/incubation of new varieties, planting material multiplication techniques and climate-smart production practices; nutrition awareness building
LAMP	Potato value chain development	Potato importance as cash crop; cassava, taro and sweetpotato importance in food security/ livelihoods	Potato and cassava value chain studies; resilience study; FBS for RTCs; production and postharvest management of seed potato; sweetpotato silage as feed; knowledge products
SRDP	None	Options for enhancing role of cassava (cash, livestock feed) and sweetpotato (fresh market), and for typhoon resilience	Sweetpotato planting material multiplication techniques; cassava and sweetpotato climate-smart production practices; knowledge products

Sources: investment project design documents, IFAD president's reports, FoodSTART scoping studies, FoodSTART project reports.

2016b). For SRDP and SOLID (focusing on commercial and export-oriented value chains) the project's fit was also unclear, despite relevance of RTCs to target beneficiaries, as was shown in the scoping studies (FoodSTART+, 2016c, 2016d). In the earlier experience with CHARMP2, various RTCs had been identified in initial community-level priority-setting processes and they became a key raw material in product development by FBS groups located in those communities.

#### 4.2. Co-ordination

The interaction between FoodSTART and investment projects in the initial meetings and during the stage of coordination (Fig. 1) for scoping studies allowed to understand better “the regime”. In particular it became apparent that investment projects were embedded within national and provincial public sector hierarchies implying that decisions and agreements about the collaboration, especially investment project staff support for the scoping studies, were often made by higher level managers organizationally and geographically remote from the project sites and often from the discourse about RTCs and FBSs. Interacting with these managers was crucial for avoiding delays in implementation. In FishCORAL, different kinds of decision-making stretched from local project sites to provincial offices several hours distant in some cases, to the national headquarters in Manila. The SOLID project had hands-on decision makers located 2700 km from project operations. These senior decision-makers were often responsible for a wide range of public works and services, with the investment project being a small part of that portfolio (for instance, the main decision-maker in LAMP during exploratory talks and the scoping study was the civil servant responsible for State-wide planning in Meghalaya) making them relatively inaccessible both to investment project and FoodSTART staff involved in implementing the partnership on the ground.

Another regime characteristic which impacted on partnership dynamics affecting scaling was the high turnover among senior managers in the different national or provincial hierarchies. The carefully constructed rapport with decision-makers disappeared when they were replaced with new managers. Except for Vietnam, this situation occurred in all investment projects, sometimes involving national leadership, sometimes provincial. This issue of turnover among senior management is part of a larger issue of staff continuity at all levels and with both investment and grant projects. In LAMP, the trust established early on with the Executive Director was interrupted when he moved to a different position. A second change in leadership occurred after 1 year, meaning slower internal decision-making processes and for FoodSTART the need to build each time fresh rapport, understanding of the research-development interface and trust. On the research project side, the embedded staff member in India left after 1 year. His

replacement also stayed for only 12 months and both of these rapid departures reflected the strong, culturally specific attraction of seeking long-term stability in government employment rather than short-term work in an international organization. This slowed the motivational, facilitative and “boundary” functions of the research project.

The early trust-building and demonstration of a credible and relevant research contribution to the investment project through the scoping studies and multi-stakeholder workshops which presented the results of the scoping studies after their conclusions, involved intensive work for FoodSTART, schematically illustrated by the positioning and size of the arrows in Fig. 1. With growing trust and credibility, there was an expectation to reach over time a more equitable sharing of resources and responsibilities, always ensuring that the collaboration continued to benefit both organizations and their stakeholders.

#### 4.3. Cooperation

A deepening of the partnership towards the stage of co-operation occurred through the development of joint workplans, with identification of key activities, assignment of responsibilities and identification of financial or in-kind contributions. The variation across the partnerships in the degree of workplan implementation and sharing of resources was due to different factors. CHARMP2, LAMP and FishCORAL quickly realized the potential contribution of the partnership and the FBS innovation to their objectives and recognized the need to commit resources. This was affirmed by their readiness to go beyond implementing the workplan activities and expand to more beneficiaries or to new areas. Active brokering and facilitation by the respective IFAD country offices in India and Philippines likely played a role in this commitment – other county offices were less engaged.

The slower progress of partnership development in INREMP, SOLID and SRDP occurred through distinct circumstances. INREMP had a different sectoral affiliation (forest conservation) which resulted in greater caution on the part of its senior management in engaging with agricultural innovation, despite intensive and flexible partnering and support from the FoodSTART liaison and senior staff, and the interest expressed by community organizations. In the case of SOLID, the imminent closure of the project as well as the initial lack of commodity ‘fit’ led to the hesitancy by the project management. This changed following a donor-driven review of nutrition dimensions of the project and the recognition that sweetpotato and cassava could play an important role in livelihoods and nutrition at local level.<sup>5</sup> SRDP was also approaching

<sup>5</sup> The study was an independent activity undertaken by CIAT and implemented by the same personnel involved with FoodSTART+.

project closure and had already adopted an approach to value chains and marketing that did not fit with FBS.

The major co-operative activity between FoodSTART and the investment projects was what we refer to as “innovation incubation” of FBS: the niche testing of the innovation involving investment project staff (regime level) as well as FoodSTART. Based on preceding partnering processes during network and cooperation stages, all investment projects agreed to participate in the niche testing of FBS with the exception of SRDP in Vietnam due to the above-mentioned challenges.

Orientation workshops were organized for staff of each investment project that had included FBS in the joint workplan in response to market opportunities identified through the scoping studies and stakeholder workshops. During the orientation workshops both opportunities and challenges for the FBS integrated approach started emerging. Most investment project staff were keen on adopting the approach and early on proposed adapting the curriculum to include non-RTCs (e.g. marine products for FishCORAL). On the other hand, FBS as a builder of social capital was not enthusiastically received, with proposals to reduce the attention on group formation and instead targeting existing and active farmer groups.

In the early stages of innovation incubation, FoodSTART made a significant investment in building capacity of FBS facilitators (selected from among investment project staff and community members) for the first test cycle (usually with 5–6 groups enrolled per investment project). Later on, investment projects needed regular support from FoodSTART local staff and via periodic visits by senior staff or advisors, for field monitoring and refresher workshops to discuss challenges, review progress and plan future FBS sessions, including final business launch. Feedback from participants and project staff guided further revisions of the FBS curriculum to enhance the ‘fit’, including greater attention to gender and climate change issues which were priorities for both FoodSTART and partner investments.

#### 4.4. Collaboration

The stage of collaboration in the conceptual framework is where there is expectation of large-scale investment in the innovation process by the regime, with key personnel within the regime having passed through a transformative learning process to begin fully support the FBS methodology. Workshop evaluation feedback from participants revealed that two types of learning process occurred among investment project personnel. First, the initial FBS orientation workshops involved participation from a wide range of staff, from senior managers to field staff in all locations. The participation of senior managers facilitated institutional support for the innovation incubation process. Indication that the managers in four of the investment projects had recognized the opportunity offered by FBS was a first critical step for subsequent scaling in these partnerships. Managers appreciated and took advantage of the FBS potential for spill-over across multiple commodities. For instance, CHARMP2 besides cassava and sweetpotato used the approach for many other commodities like coffee, local pigs and vegetables. FishCORAL adapted FBS to cover aquatic-based products (e.g., processed fish, seaweed, seafood) and in SOLID, FBS groups also developed products that combine RTCs and fish (e.g., cassava-fish crackers).

Second, field staff of investment projects and key members of target communities went through an intense learning process to become FBS facilitators. For some individuals this was a transformative learning process based on their responses to an evaluation process known as Most Significant Change (Dart and Davies, 2005; CIP, 2019). In CHARMP2 an initial cohort of 12 facilitators graduating from a “Training of Facilitators” led by FoodSTART staff in 2012 facilitated the first cycle of six FBSs. CHARMP2 implemented FBS and covered operational expenses, whilst FoodSTART covered its own staff time and travel costs related to the trainings and period visits. By 2014 the partnership transitioned into a new arrangement in which CHARMP2

continued to train additional facilitators and implement several further FBS cycles. Notably, FBS graduation became one of the eligibility criteria for farmers to access loans (and then grants) provided by CHARMP2. There was a gradual reduction in the training and advisory contributions from FoodSTART during this time, with the emergence of a new monitoring, learning and evaluation advisory role. One dimension of this new arrangement involved CHARMP2 commissioning FoodSTART to produce a series of knowledge products (e.g. manuals, action-learning stories). Another dimension, following the commencement of FoodSTART second phase, was the participation of CHARMP2 staff as mentors in learning events involving other investment projects.<sup>6</sup>

The other four partnerships where FBS was more recently introduced—LAMP, INREMP, FishCORAL and SOLID—have had less time than CHARMP2 to scale FBS and implementation has been varied. LAMP was open to test FBS partly because it was in an early stage of implementation and had no fixed approach to value chain development. Furthermore, FBS fitted both the long value chain development of target commodities like potato and the shorter value chains aligned with its integrated development approach. The business launch of the first six FBS groups was held in September 2018. However, LAMP has gone furthest in medium level of scaling, indicated by roll out to six more communities in the second cycle.

Following INREMP's recognition of a good ‘fit’ between RTCs and agro-forestry livelihoods in the target communities, the first cycle started in December 2016 with five FBS groups, though completion was delayed until July 2018 due to internal staff turnover. This partnership continued focusing on one catchment area, though the project management team requested support to expand to new areas.

FishCORAL managers and local government recognized that both cassava and sweetpotato are a good fit for strengthening alternative non-marine livelihoods of the target fishing communities and their resilience to typhoons. This has translated into strong support for the partnership, especially from the national project director, and has led to the adaptation of FBS which was renamed and institutionalized as Aqua-based Business School (ABS). Following recommendation by an IFAD supervision mission,<sup>7</sup> ABS is now being implemented in two additional regions beyond the original sites proposed in the collaborative workplan.

SOLID's initial focus on estate crops/long value chains precluded attention to locally produced and consumed RTCs. Following the project's increased emphasis on locally available and nutrient-rich crops and with more stable project management in place, in early 2018 SOLID agreed to co-finance FBS targeting sweetpotato and cassava, with five groups in each of the two target provinces. The FBS cycle concluded with two business launches in October and November. Though the potential for further scaling was limited by SOLID's imminent closure, some local government funding was made available to continue supporting three FBS groups.

Fig. 2 shows how the cumulative number of FBS established through the relevant partnerships and the total number of enrolled farmers have increased over time. A total of 3914 farmers were enrolled in 147 FBS between 2012 and 2018. There are four times as many women enrolled than men as in many communities women were purposively targeted and/or more proactive in accessing new opportunities for business and enterprise skills. They are often more comfortable working within groups and appreciated the regular social interaction provided through product development activities. Women are also commonly involved in selling produce in local markets and FBS products can provide an additional income stream. However, SOLID staff reported that in some cases women left the FBS groups under pressure from their husbands,

<sup>6</sup> CHARMP2's non-inclusion in FoodSTART's second phase resulted from IFAD's desire to expand the research-development learnings from the first phase of FoodSTART to new investment project partnerships.

<sup>7</sup> Aide Memoire of IFAD supervision mission to FishCORAL.



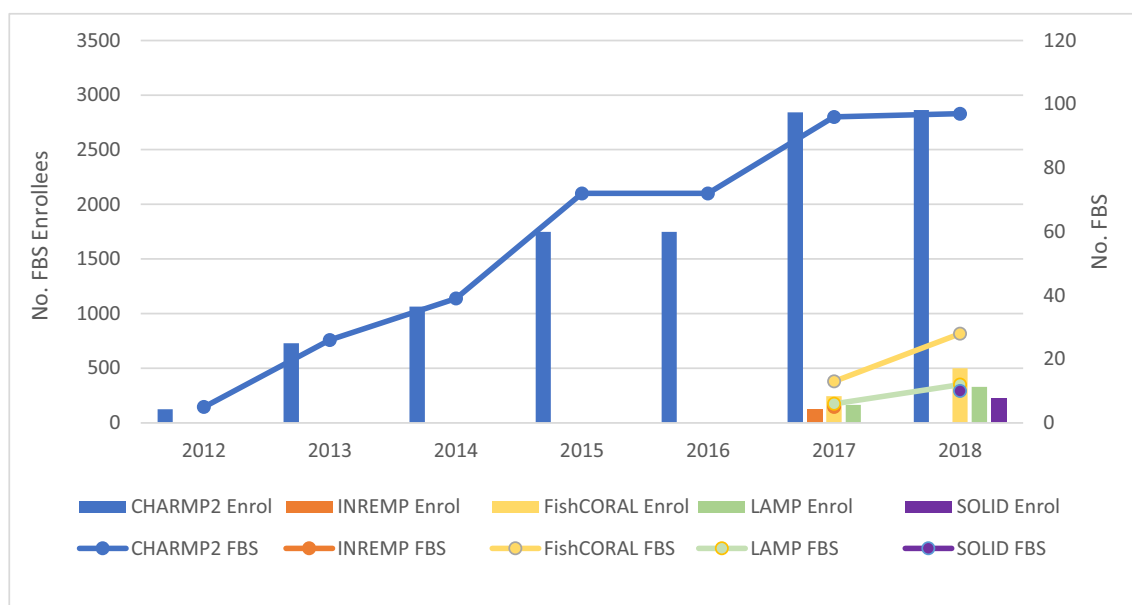


Fig. 2. Cumulative number of FBS and enrollees by year and investment partner.

who resented the time they were spending away from home.

Where FBS was introduced, technical innovations were almost always integrated within the overall methodology of group formation, business skills development and market assessment. The main technologies of interest were focused on product development, though in LAMP, some groups focused on improved potato seed quality and marketing. Some groups were also involved in testing sweetpotato, potato and cassava varieties for their postharvest characteristics and improved production of sweetpotato planting material. These were mostly undertaken within the FBS framework, for example in FishCORAL and INREMP. In SOLID sites, because of the delay in implementation, participatory varietal selection (PVS) and demonstration (demplots) were initiated and then absorbed within the FBS systems approach only once approval and funding were granted to start the first FBS cycle in the same communities. Nevertheless, the curriculum was considerably shortened by extension staff, with greatest focus on commodity prioritization, market visits and product testing, and less attention to livelihood visioning or business planning.

#### 4.5. Cross-cutting aspects of partnership dynamics: monitoring and learning

To assess the quality of the partnerships for scaling, FoodSTART+ and IFAD introduced specific monitoring and learning tools. Through the CIP “partnership health check-up” (see Annex 1) partners provided reciprocal feedback in 2017 and 2018 on organizational contributions to collaboration, the degree of mutual support, transparency and accountability. Scores for almost all these criteria at or above 4 on a 0–5 Linkert scale indicated that both the investment project and FoodSTART+ staff involved in the partnerships rate the collaboration highly.

During the panel discussions, conducted during the FoodSTART+ – convened review meeting, investment project representatives were asked to identify in what way FoodSTART+, as a research organization with expertise in RTCs and value chains, had influenced changes in the investment project programming, whether there had been increased relevance and priority given to RTCs and if there had been scaling of FoodSTART+-introduced innovations over the course of the partnership (Table 3). In terms of influence, both INREMP and FishCORAL mentioned the systemic benefits of FBS in relation to the food system and the aquatic system, rather than just crop production. SOLID, where FBS started late, acknowledged FBS as a key

innovation, and related it favorably to “a local business and commodity approach”. SRDP, where FBS was not introduced, highlighted technical training for farmers and the potential of RTCs. In the LAMP case, the team highlighted some more technical elements of FBS, such as the support received for organic potato production. This practice had become part of “regime” orthodoxy because of the top-down policy decisions of the State Government to shift towards organic farming. The LAMP team also acknowledged the scale-out – more than had been originally planned – of the whole FBS approach. The main challenges different teams faced across the partnerships were related to the timing of the project cycle and the availability of staff time for the time-intensive work associated with FBS.

IFAD also used a short questionnaire in 2018 to gauge the effectiveness of the partnerships from the perspective of the investment projects. This also reached positive conclusions (overall average score 5.1 on a 1–6 Linkert scale) with highest ratings given to the “relevance to target groups”, “attention to gender aspects” and “innovation”. Panel discussions highlighted that the most valued innovations included the new methodologies (FBS, knowledge management, and documentation techniques), new technologies (crop production and processing) and the institutional innovation of the research-development collaboration itself. Liaison staff were felt “to ensure effective partnerships with investment projects”.<sup>8</sup> The main challenges identified related to partnership establishment late in the project cycle (SRDP and SOLID) and delays caused by staff turnover and management issues.

## 5. Analysis and discussion

In the introduction, we considered recent work on scaling agricultural innovations, particularly where the innovation under consideration was a complex mix of both technological model and a means for achieving broader changes. Those studies highlighted different conceptual levels involved in scaling, specially what they call “protected niches” which can also be considered a level of innovation piloting, and the stable, regulated “regimes” where agricultural innovation is supported through conventional methods. We suggested that in order for an innovation to scale beyond the niche level, a key

<sup>8</sup> IFAD internal document “Assessment of implementation progress by Partners”.

**Table 3**  
Summarized discussion results from investment partner panels.

Project	Q1 FoodSTART influenced changes?	Q2 Change in relevance of RTCs through partnership?	Q3. Innovations for scaling introduced by FoodSTART?	Q4 Challenges faced?
INREMP	Helped to achieve livelihood targets; project restructure led to better alignment	No RTCs in project design (forestry focus); RTCs now considered for poverty reduction, business goals	FBS aligned to food system approach, scaling outside INREMP areas possible; documentation processes; Most Significant Change evaluation methodology	2 years to complete 1 FBS cycle, due to low priority for foresters/mgt and staff changes; also market sustain-ability an issue
FishCORAL	Changed strategy and approach to VC development	Original focus on fisheries; but inclusion of RTCs rebounded faster than communities with RTCs	FBS adapted for aqua-based products (ABS); knowledge products and documentation	Need to provide staff time for collaborative activities; staff turnover and management issues.
LAMP	Collaboration moved from NRM component to Inclusive Livelihoods component of project; FBS fits well	FBS with RTCs promising; original project included potato; consumption fits with NRM component; now cassava also present	Organic cultivation practices; field guide for pests and diseases; FBS scale-out to more villages	Target beneficiaries have poor market understanding
SOLID	Good synergy as local business and commodity approach	FoodSTART + objectives aligned to SOLID following review of project design. More than half of FBS groups use RTCs now.	FBS, M&E methodologies	Late start of the collaboration; men object to women's participation in FBS; need to ensure income increase for FBS group sustainability
SRDP	Helped consolidate objectives, farmers learned new things	Originally only cassava for food was included; now more attention to production and processing, and sweetpotato also included.	Training methods (farmers and technical experts); potential of RTCs; knowledge products/documentation	Late start of the collaboration; limited flexibility in own budget allocation; VC approach requires up-front market security

consideration concerns collaborative relations between the actors and that the dynamics of these partnerships respond to commonalities, differences and complementarities between partners. We drew on the insights from literature to develop a conceptual framework to analyze the experiences of six research-development partnerships which sought to scale a complex innovation like FBS.

How successful were these partnerships in scaling FBS? Fig. 2 suggests that in the five cases in which FBS was introduced, scaling of FBS is either in full swing (CHARMP2), in full take off (FishCORAL and LAMP), or is at an initial stage (INREMP and SOLID). But can we say that there is a real transformation going on in these different investment projects in relation to the understanding and practice of development, as a result of working with the FBS methodology? Earlier we cited results of FBS facilitator evaluations using the Most Significant Change methodology indicating that there were major changes in knowledge, attitudes and practices among these facilitators. But we do not have robust data to understand whether there has been transformative change at institutional level. We do have the limited evidence from the “partnership health check-up” that suggests recognition by some senior staff about the way FBS has shifted the focus of their organization's development efforts from production to food systems and has helped integrate multiple types of food system based on forest, aquatic and agricultural resources. These senior staff recognized FBS as an integrated approach rather than, say, a marketing strategy or “product development”. It is seen as a business approach (SOLID) and not just a commodity approach. Some observations by LAMP staff about “organic potato production” and “pest and disease management” suggested the reversion to a technocratic interpretation of FBS, also alluded to by [Muilerman et al. \(2018\)](#) in relation to some “regime” responses to FFS.

Time was seen as a major challenge. One aspect of time was the late introduction of FBS in the project cycle. Another aspect of time raised by investment project staff concerns the time necessary to support the scaling of a complex approach like FBS. We saw that in some cases the full FBS methodology was adapted to reduce time investment in the training. Adaptation of methodologies is evidence of on-going innovation, but it also raises the issue of whether a minimum set of elements is needed to ensure the viability and quality of the approach. This issue has also been faced by FFS ([Van den Berg and Jiggins, 2007](#)) and before that in relation to participatory research ([Sanginga et al., 2006](#)). The way FBS groups became institutionally integrated with other investment project components, in some cases the entry point for access to livelihood benefits, provides additional initial evidence for successful scaling such a complex innovation. This integration was closely associated with the recognition and exploitation by investment project staff of the applicability of FBS to a wide range of priority commodities in the investment project.

But returning to our central research question: What factors or drivers account for the ability of research-development partnerships to progress through the different stages of collaboration involved in scaling FBS? As mentioned in [Section 2](#), a review of literature dealing with partnership found that “surprisingly little attention has been devoted to the drivers of partnership” ([Horton et al., 2009:82](#)). [Table 4](#) provides a summary of what was learnt about these drivers across the different research-development partnerships. The findings reported here give some support to the distinction of different external, organizational and individual drivers identified by several writers and discussed earlier in [Section 2](#). We found the notion of an “external” environment dauntingly broad, since it includes so many unknowns that might or might not influence those involved in the partnership, including the political, social and employment environments at the time. Nevertheless, there are factors in the external environment which translate into more tangible drivers from the point of view of the partnership. An example is the employment environment. This can have a multitude of unclear effects on a partnership, for instance in terms of alternative options and underperformance due to low pay. But what directly affects a partnership is staff turnover, which is the internal

**Table 4**  
Drivers of partnership for scaling across six research-development partnerships in Asia.

	CHARMP2 (Philippines)	FishCORAL (Philippines)	INREMP (Philippines)	LAMP (India)	SOLID (Indonesia)	SRDP (Vietnam)
Direct or negotiated good 'fit' with sector and commodity focus	Direct. Strong recognition of role of RTCs in livelihoods of target communities	Negotiated based on evidence. Focus on marine resources revised to include agriculture with locally important RTCs	Negotiated based on evidence. Focus on forest conservation revised to include RTCs in agro-forestry systems	Direct and negotiated based on evidence. Original fit in commercial potato sector supplemented with other RTCs for food security	Negotiated based on evidence and mid-term review which encouraged attention to shorter value chain commodities for local markets, including RTCs	Negotiated based on evidence. Initial exclusion of RTCs due to focus on commercial value chains. Upland cassava and coastal sweetpotato partially negotiated
Conducive timing of partnership formation	Conducive. Convergence of CHARMP2 with FoodSTART engagement	Conducive. FoodSTART + and FishCORAL starting at same time	Conducive. Convergence of FoodSTART + with delayed start-up of INREMP	Conducive. FoodSTART + and LAMP starting at same time.	Non-conducive. SOLID over 50% completed. Externally mandated redirection opened up FBS opportunity, but very late for scaling	Non-conducive. SRDP 40% completed at first networking with FoodSTART. FoodSTART delay compounded problem.
Good 'fit' of FBS with project components	Integration of FBS with allocation of loans/grants and local extension system	Integration of ABS with allocation of livelihood funds	Integration of FBS with allocation of funds and with local extension system	Integration of FBS with Enterprise Facilitation Centers and local extension system	Integration with local extension system which runs FBS as part of program	Peripheral to provincial investment project and extension system. Mostly FoodSTART driven
Stable staffing	Stable leadership throughout collaboration	Stable project leadership but turnovers at provincial level caused delays and site changes. Stable FoodSTART liaison staff helped mitigate situation	Stable national and regional level leadership and provincial staff. Instability at provincial leadership level slowed implementation. Stable FoodSTART liaison staff helped mitigate situation	Strong, hands-on project leadership changed at beginning of Coordination stage. Loss of momentum. Replacement which had less delegated authority, also rotated. High turnover of FoodSTART liaison staff	High level of turnover of senior project staff during first 2 years of collaboration limited partnership process. Stable FoodSTART liaison staff, but remote from implementation site.	Stable SRDP staff. FoodSTART staff remote from project until delayed appointment of embedded liaison staff
Devolved internal decision-making	Devolved decision-making to accessible, rapid, supportive, informed host manager	Dispersed <sup>a</sup> and complex, between national project leader and regional managers	Dispersed and complex between national, regional and provincial leaders	Initially devolved to project leader, then concentrated in remote, senior host organization manager. Then devolved again to more senior project leader	Dispersed and complex across different national agencies and within provincial authorities	Devolved decision-making to project leader who also holds senior position in provincial government
Intensity and mutuality of partnering	Frequent interactions, strong rapport and shared vision; trust well established; clear mutuality and equity	Frequent interactions with national and regional leaders/staff; good rapport, shared vision with project leaders/staff, limited with some managers; trust well established with project team, clear mutuality and equity	Frequent interactions with national/regional leaders and provincial staff with shared vision, trust and mutuality.	Frequent interactions when embedded liaison staff present, intermittent thereafter; strong rapport with project focal point, less with formal leadership; trust built up; clear mutuality and equity	Intermittent interactions with project leadership; trust dissipated with senior staff changes, but established at site level; shared vision achieved late in project; mutuality and equity not fully clarified	Intermittent interactions early on, and non-equitable interactions through embedded staff; limited rapport and shared vision; trust built up at later stage; mutuality and equity weak

<sup>a</sup> 'Dispersed' decision-making refers to there being multiple levels of decision-making with complex and sometimes unclear jurisdictions.

manifestation of those external employment factors. Staff stability emerged as an important driver for the performance of the partnerships under consideration (Table 4). Two organizational drivers were identified through the experience of the case studies. One critical driver was the alignment of life-cycles of the research grant and the investment project. This is not a characteristic of the partnership itself but can affect the conduciveness of the partnership formation. The second organizational driver that emerged as very important was the functioning of both the investment project and the grant project within their respective host organizations and especially the extent to which there was devolution of decision-making. Among individual drivers we identified the intensity and mutuality of partnering as most important, which supports the suggestions of Caplan et al. (2007), Brinkerhoff (2002) and others.

It was noted in Section 2 that only one publication in the review of partnership literature by Horton et al. (2009) refers to the notion of “fit” in relation to partnerships, but as a criterium for evaluating potential partners rather than as a driver of partnership development. We noted two dimensions of the term: as an indicator of the potential for collaboration and for the scalability of the innovation around which the partnership is formed. We found that both of these can be understood as drivers. The first concerns the extent to which there is a good “fit” with the commodity and sectoral focus of the investment project. The second refers to extent to which there is a good fit of the innovation, in this case FBS, with the particular scaling strategies and components already existing in the investment project.

Although a direct fit between the commodity prioritization of the investment project and the expertise in RTCs offered by FoodSTART was an important driver for establishing the partnership, it was not critical, as long as there was openness to negotiate such a fit. A direct fit occurred in only two of the six cases and one case only partially. In CHARMP2 the fit was direct due to the priority given to locally grown RTCs in the project design and this provided a strong basis for establishing the partnership. In LAMP, a direct fit occurred for the commercial potato crop, but for other RTCs there was need for evidence and negotiation. In all the other cases, negotiation based on scoping study evidence created a fit with RTCs and, in the case of FishCORAL and INREMP, RTCs became integrated within non-agricultural sectors. However, even where a fit was negotiated in terms of the commodity and the sector, the partnership had greater chance of success if this negotiation occurred at the start of the investment project cycle. This was the case with FishCORAL, INREMP and LAMP (the latter for non-potato RTCs). For SOLID, it took the late intervention of an external mission to push the project into a different sector – small-scale agriculture aimed at local nutrition rather than the agricultural export sector – and to respond to the scoping study evidence. For SRDP, the negotiation based on scoping study evidence made the investment project acknowledge the role of RTCs, but with very limited change in workplan in the final stages of the project.

The second aspect of goodness of fit as a driver of the partnership relates to the FBS innovation rather than the commodity. The social and institutional characteristics of FBS – group formation and functioning, close links to the extension system, engagement in both food security and economic activities – enabled it to be easily integrated with the different kinds of livelihood support activities, including allocation of micro-financing present in most of the investment projects. As previously mentioned, in CHARMP2, acquisition of a livelihood fund became contingent on being graduated from FBS. At the other extreme, FBS did not fit well with the approach to value chains and marketing that had been already established by SRDP and which required the farmer groups to have already a formal contract in place with a buyer.

The stability of staffing in both the development and research organizations greatly affected the pace of scaling. CHARMP2 demonstrated the most successful scaling, as Fig. 2 clearly illustrates. Partly this resulted because of the longer time frame that CHARMP2 has been adopting FBS, but the stability of both senior management and project

leadership was a key factor. Staff turnover reflected external factors in the employment context over which the partnership had no control, as was mentioned above. For instance, LAMP leadership was subject to rapid rotation and the FoodSTART liaison staff hired there were subject to the cultural pressure of taking stable, long-term employment in the public sector, rather than short term work in an international organization.

The extent of devolution of internal decision-making proved to be an important driver, which was also linked to the stability of staffing. Where there was stable leadership within the parent organization and the project, there also tended to be devolved decision-making. This was the case in both CHARMP2 and SRDP. Where there was frequent turnover of host organization staff, there tended to be less willingness to delegate decision-making. This occurred in LAMP when a more junior officer took over as project leader, but decision-making was retained at a higher level of the host organization. It also occurred in FishCORAL, INREMP and SOLID with their complex multi-layered organization between national, regional and provincial leadership.

The intensity and mutuality of partnering is a crucial driver of collaboration. It is concerned with the interpersonal and normative components as well as the shared vision and trust. It involves certain behaviors of individuals involved in the partnerships as efforts are made to harness the power of collaborative advantage (Huxham and Vangen, 2005) to achieve desired individual and mutual goals. Since frequent interactions are crucial to build trust, there is a strong link with staff stability. From FoodSTART's side, the liaison staff have been essential contributors to partnering, trust-building and mutuality and in most cases they have worked closely with either explicitly designated “focal points” within the investment project, as in the case of LAMP and ultimately SOLID, or with accessible local investment project staff, as in the case FishCORAL and INREMP. It is difficult to draw any clear conclusions about the relative effectiveness of the three different types of liaison staff described in Section 3: embedded, neighborhood and designated. For instance, embedding of staff, which might be considered to offer the most intensive type of partnering, occurred in two cases with very different scaling outcomes. In LAMP, the two embedded staff made important contributions to building the necessary trust and rapport for initial scaling to take place. In SRDP, the embedded junior staff was unable to successfully build rapport with the senior leaders and did not enjoy significant mutuality or equity. But since the other drivers in the FoodSTART-SRDP partnership were not conducive to a successful collaboration for scaling FBS, it would be a mistake to attribute too much to the situation of the embedded staff. As Table 4 indicates, the “neighborhood” positioning of the liaison staff collaborating with FishCORAL and INREMP worked well, and was able to re-deploy to an embedded status with these investment projects when staffing and other challenges occurred.

## 6. Conclusion

By way of conclusion, we would like to revisit the conceptual framework. The organization of the paper has followed the partnership dynamic, through the different stages of partnership. The drivers have helped to understand both the relations between the partners within particular stages and also the movement between stages, towards greater scaling. Nevertheless, the framework underestimates the horizontal dynamic in research-development partnerships. If the vertical dynamic is about changes in the content of collaboration, the horizontal dynamic is about the dramatically changing role of each partner in the collaboration over time. The literature also gives much more attention to the vertical dynamic through the different stages, and much less to the fact that at least in research-development partnerships, some partners are barely present at the beginning, and others disappear as partners after the collaboration has run a certain course. The experience of the FoodSTART-investment project partnerships is that the niche activities led by the FoodSTART research team encountered investment



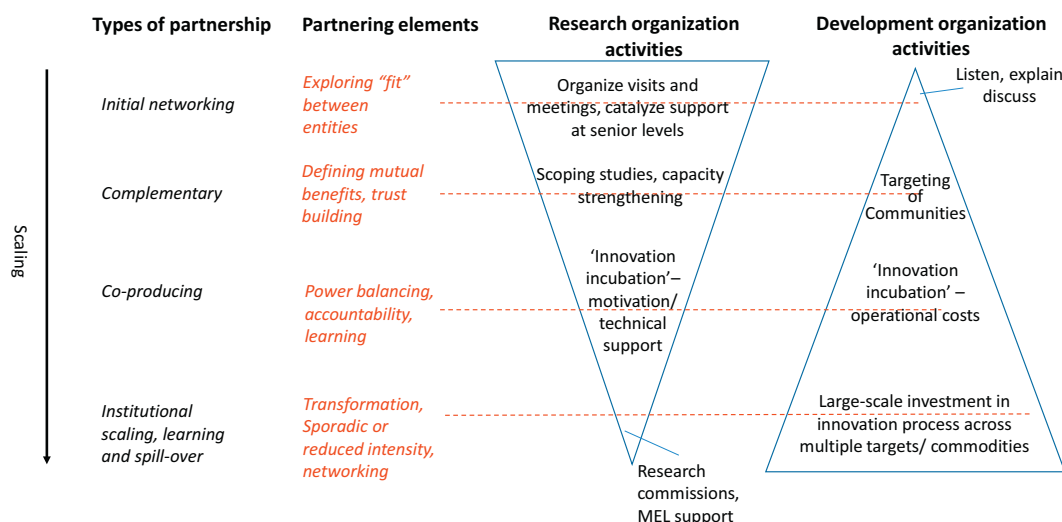


Fig. 3. Changing contributions by partners to scaling agricultural innovations in FoodSTART-IFAD investment project collaboration, with activity examples.

projects that barely existed as partners, but with gradual scaling of FBS, these roles reversed. We try to capture this in a revised version of the framework presented in Fig. 3, based largely on the collaboration with CHARMP2 which has been running for the longest time. CHARMP2 began investing in large scale implementation of FBS in 2015 and the role of FoodSTART changed to a small contributor of different kinds of support services, which eventually came to an end as FoodSTART became involved in new scaling partnerships with other development organizations.

The analysis of experiences of research-development collaboration for scaling a complex innovation like FBS and the way they evolved over time underlines the need for looking at innovation and scaling as organically connected processes of which partnerships are an integral part. The recognized stages through which most partnerships pass provides a useful framework for analyzing the dynamics and drivers of these partnerships. These drivers include a conducive external environment, good fit between what offered and demanded by partners, reasonable alignment in the timing of the partners' intervention, excellent partnering of the individuals involved in the partnerships, their limited turnover and sufficient ability to make decisions related to collaborative activities. While this list is unlikely to be comprehensive, recognizing these drivers, or the lack of, and the way they are intertwined can greatly enhance the likelihood of establishing and maintaining effective partnership for scaling innovation.

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We hereby declare that:

- All authors have participated in (a) conception and design, or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and (c) approval of the final version.
- This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue.
- The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript

**Annex 1: Partnership health check-up tool**

*a. Form for staff of partner investment*

Questions for partnership "health check-up"	Score (1-5)	Comments
	Low to High	

My organization understands the vision of research-development integration which the FoodSTART+ - IFAD investment project partnership represents  
 My organization is clear about its role in this collaboration

My organization is clear about the roles of the two research partners in the FoodSTART+ - IFAD investment project collaboration (CIP and CIAT)  
 I personally have an understanding about overall FoodSTART+ project activities in relation to collaboration with [INVESTMENT PROJECT] in my location  
 My organization accesses information/is informed about the overall FoodSTART+ activities across all countries  
 Internal project communication among partners is satisfactory (i.e. partners with which the project has a formal agreement such as a collaboration agreement or sub-contract).  
 Communication with external stakeholders such as research organizations is well handled (i.e. stakeholders who the project wishes to influence, but where there is no formal agreement).  
 Investment project and FS+ in specific sites have common or similar perspectives or ideas related to project activities  
 When differences in perspectives have occurred, efforts have been made to resolve them  
 My organization is willing to learn from experiences and is able to modify the way we do things.  
 My organization supports my participation in the partnership with FS+  
 I am aware of my responsibilities in our organization's partnership with FS+.  
 FS+ provides enough inputs and feedback for our needs in this partnership  
 I feel the decision-making process in the FS+ Investment project collaboration is transparent and inclusive.  
 I am pleased with the level of honesty and trust in this partnership.  
 I am satisfied to be contributing to this partnership between [INVESTMENT PROJECT] and FS+

## b. Form for FoodSTART+ staff

Questions for partnership "health check-up" – FS+ side	Score (1–5)	Comments
	Low to High	
<p>I understand the vision of research-development integration which the FoodSTART+ – IFAD investment project partnership represents            I am clear about my role in this collaboration            My organization is clear about the roles of the two research partners in the FoodSTART+ – IFAD investment project collaboration (CIP and CIAT)            I personally have an understanding about overall [INVESTMENT PROJECT] activities outside of the collaborative activities with FS+            FS+ accesses information/is informed about the overall [INVESTMENT PROJECT] activities in a particular site            Internal project communication among partners is satisfactory (i.e. partners with which the project has a formal agreement such as a collaboration agreement or sub-contract).            Communication with external stakeholders such as research organizations is well handled (i.e. stakeholders who the project wishes to influence, but where there is no formal agreement).            Investment project and FS+ in specific sites have common or similar perspectives or ideas related to project activities            When differences in perspectives have occurred, efforts have been made to resolve them            I am willing to learn from experiences and am able to modify the way I do things.            FS+ Coordination provides sufficient support for my in the partnership with [THE INVESTMENT PROJECT]            I am aware of my responsibilities in the overall work of FS+.            [THE INVESTMENT PROJECT] provides enough inputs and feedback for my needs in this partnership            I feel the decision-making process in the FS+ Investment project collaboration is transparent and inclusive.            I am pleased with the level of honesty and trust in this partnership.            I am satisfied to be contributing to this partnership between [INVESTMENT PROJECT] and FS+</p>		

## References

- Bezanson, K., Narain, S., Prante, G., 2004. Independent Evaluation of the Partnership Committees of the CGIAR. CGIAR Secretariat, Washington, D.C.
- Biggs, S., 1990. A multiple source of innovation model of agricultural research and technology promotion. *World Dev.* 18 (11), 1481–1499.
- Biggs, S., 2007. Building on the positive: an actor innovation approach to finding and promoting pro-poor institutional and technical innovations. *Int. J. Agric. Resour. Gov. Ecol.* 6 (2), 144–164 (special issue on institutional change in agricultural innovation systems).
- Biggs, S., 2008. Learning from the positive to reduce rural poverty and increase social justice: institutional innovations in agricultural and natural resources research and development. *Exp. Agric.* 44 (1), 37–60.
- Brinkerhoff, J.M., 2002. Assessing and improving partnership relationships and outcomes: a proposed framework. *Eval. Program Plan.* 25 (3), 215–231.
- Brouwer, H., Woodhill, J., 2015. *The MSP Guide. How to Design and Facilitate Multi-Stakeholder Partnerships.* Centre for Development Innovation, Wageningen UR, Wageningen.
- Caplan, K., Gomme, J., Mugabi, J., Stott, L., 2007. *Assessing Partnership Performance: Understanding the Drivers for Success. Building Partnerships for Development in Water and Sanitation (BPD)*, London 36 pages.
- Cash, David W., Clark, William C., Alcock, Frank, Dickson, Nancy M., Eckley, Noelle, Guston, David H., Jager, Jill, Mitchell, Ronald B., 2003, July 8. Knowledge systems for sustainable development. *PNAS* 100 (14).
- Cassen, R., Associates, 1994. *Does Aid Work? Report to an Intergovernmental Task Force, Second edition.* OUP Higher Education Division, Oxford, UK.
- CIP, 2017. *Farmer Business Schools in a Changing World: A Gender-Responsive and Climate-Smart Manual for Strengthening Farmer Entrepreneurship.* CIP, Lima, Peru. <http://hdl.handle.net/10568/89463>.
- CIP, 2019. *Connecting Smallholder Root and Tuber Growers to Markets Through Farmer Business Schools, Lima, Peru.* <https://doi.org/10.4160/9789290605287>.
- Clark, N., 2002, June. Innovation systems, institutional change and the new knowledge market: implications for third world agricultural development. *Econ. Innov. New Technol.* 11 (4–5), 353–368.
- Dart, J., Davies, R., 2005. The 'Most Significant Change' (MSC) Technique: A Guide to Its Use. <http://www.clearhorizon.com.au/publication/the-most-significant-change-msctechnique/>.
- Edwards, M., Hulme, D., 1992. Scaling up NGO impact on development: learning from experience. *Dev. Pract.* 2 (2).
- Engel, P.G.H., 1997. *Facilitating Innovation for Development: A RAAKS Resource Box.* Royal Tropical Institute, Amsterdam.
- Farrow, A., Ronner, E., van den Brand, G., Boahen, S., Leonardo, W., Woldemeskel, Endalkachew, Adjei-Nsiah, S., Chikowo, Regis, Baijuka, Frederick P., Peter, Ebanyat, Sangodele, S., Sanginga, J.M., Kantengwa, S., Phiphira, L., Woome, P.L., Ampadu-Boakye, T., Baars, E., Kanampiu, F., Vanlauwe, Bernard, Giller, Ken E., 2016. From best fit technologies to best fit scaling: incorporating and evaluating factors affecting the adoption of grain legumes in Sub-Saharan Africa. *Exp. Agric.* <https://doi.org/10.1017/S0014479716000764>, page 1 of 26 Cambridge University Press 2016.
- FoodSTART, 2011. *Scoping Study: Cordillera Administrative Region (CAR), Philippines.* CIP, Los Banos, Philippines.
- FoodSTART+, 2016a. *Root and Tuber Crops Production-Use Systems and Food Resilience in Agri-Aqua and Agro-Forestry Ecosystems in Central Philippines: Results of a Scoping Study.* CIP, Los Banos, Philippines. <http://hdl.handle.net/10568/89455>.
- FoodSTART+, 2016b. *Roots and Tubers for Livelihood Enhancement in Meghalaya, India. Results of a Scoping Study.* CIP, Los Banos, Philippines. <http://hdl.handle.net/10568/89457>.
- FoodSTART+, 2016c. *Root and Tuber Crops in Central Vietnam: An Underestimated Potential for Food and Income? Results of a Scoping Study.* CIP, Los Banos, Philippines. <http://hdl.handle.net/10568/89458>.
- FoodSTART+, 2016d. *Addressing the Economic and Health Challenges Facing Smallholder Communities through Roots and Tubers in Maluku and Maluku Utara, Indonesia. Results of a Scoping Study.* CIP, Los Banos, Philippines. <http://hdl.handle.net/10568/89466>.
- Gajda, R., 2004. Utilizing collaboration theory to evaluate strategic alliances. *Am. J. Eval.* 25 (1), 65–77.
- Garb, Yaakov, Friedlander, Lonia, 2014. From transfer to translation: using systemic understandings of technology to understand drip irrigation uptake. *Agric. Syst.* 128

- (2014), 13–24.
- Geels, F.W., 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Res. Policy* 31, 1257–1274. [https://doi.org/10.1016/S0048-7333\(02\)00062-8](https://doi.org/10.1016/S0048-7333(02)00062-8).
- Gonsalves, J., 2001. Going to scale: what we have garnered from recent workshops. *LEISA* 17 (3), 6–10. Available in: <http://www.ileia.org>.
- Hackett, Sean M., Dilts, David M., January 2004. A systematic review of business incubation research. *J. Technol. Transf.* 29 (1), 55–82.
- Hall, A.J., Sivamohan, M.V.K., Clark, N.G., Taylor, S., Bockett, G., 2001. Why research partnerships really matter: innovation theory, institutional arrangements and implications for developing new technology for the poor. *World Dev.* 29 (5), 783–797.
- Hall, A.J., Yoganand, B., Sulaiman, R.V., Rajeswari Raina, S., Shambu Prasad, C., Naik Guru, C., Clark, N.G., 2004. Innovations in Innovation: Reflections on Partnership, Institutions and Learning. International Crops Research Institute for the Semi-Arid Tropics.
- Hartmann, A., Linn, J.F., 2008. Scaling Up: A Framework and Lessons for Development Effectiveness from Literature and Practice. Wolfensohn Center for Development Working Paper 5. Brookings Institution, Washington DC.
- Hocdé, H., Triomphe, B., Faure, G., Duleire, M., 2006. From Participation to Partnership, a Different Way for Researchers to Accompany Innovations Processes: Challenges and Difficulties. Paper presented at the Innovation Africa Symposium. Kampala, Uganda.
- Horton, D., Prain, G., Thiele, G., 2009. Perspective on Partnership: A literature review. Working paper 2009-3. 111p. CIP, Lima, Peru.
- Horton, D., Campilan, D., Prasetya, B., Gani, H., Pakih, M.R., Kusmana, 2013. Market Chain Development in Indonesia: Experiences with the Participatory Market Chain Approach, Farmer Business School and Business Development Services. International Potato Center (CIP), Lima, Peru Working Paper 2013–1. 72 p.
- Huxham, C., Vangen, S., 2005. Managing to Collaborate: The Theory and Practice of Collaborative Advantage. Routledge, London.
- IFAD, 2014. Moving up Innovations to Scale: Lessons from IFAD-Supported Development Interventions in the Philippines. IFAD, Manila, Philippines.
- IFAD, 2017. Country-Level Policy Engagement in IFAD: Guide Book. IFAD, Rome, Italy.
- Kitzi, J., 2002. Cooperative strategy: building networks, partnerships, and alliances. In: Dees, J., Emerson, J., Economy, P. (Eds.), *Strategic Tools for Social Entrepreneurs*. John Wiley & Sons, Inc., New York.
- Klerkx, L., Schut, M., Leeuwis, C., Kilelu, C., 2012. Advances in knowledge brokering in the agricultural sector: towards innovation system facilitation. *IDS Bull.* 43, 53–60. <https://doi.org/10.1111/j.1759-5436.2012.00363>.
- Kristjanson, P., Reid, R., Dickson, N., Clark, W., Romney, D., Puskur, R., MacMillan, S., Grace, D., 2009, March 31. Linking international agricultural research knowledge with action for sustainable development. *Proc. Natl Acad. Sci. (PNAS) USA* 106 (13), 5047–5052.
- Leeuwis, C., van den Ban, A., 2004. Communication for Rural Innovation: Rethinking Agricultural Extension, Third edition. Blackwell Science Ltd, London.
- Lundvall, B.A. (Ed.), 1992. National Systems of Innovation and Interactive Learning. Pinter, London, UK.
- McNie, E.C., 2007. Reconciling the supply of scientific information with user demands: an analysis of the problem and review of the literature. *Environ. Sci. Pol.* 10 (2007), 17–38.
- Muillerman, Sander, Wigboldus, Seerp, Leeuwis, Cees, 2018. Scaling and institutionalization within agricultural innovation systems: the case of cocoa farmer field schools in Cameroon. *Int. J. Agric. Sustain.* 16 (2), 167–186. <https://doi.org/10.1080/14735903.2018.1440469>.
- Özgediz, S., Nambi, A., 1999. Partnerships and Networks: Definitions, Forms, and Critical Success Factors. Unpublished paper presented at the International Workshop on Partnerships (coordinated by WARDA and ISNAR) Boake, Cote D'Ivoire, 8–10 December, 1999.
- Pachico, D.H., Fujisaka, S. (Eds.), 2004. Scaling Up and Out: Achieving Widespread Impact Through Agricultural Research. Centro Internacional de Agricultura Tropical (CIAT), Cali, CO 293 p. (Economics and impact series 3). <https://hdl.handle.net/10568/54259>.
- Picciotto, R., 2007. Scaling up: a development strategy for the new millennium. In: Bourguignon, François, Jacquet, Pierre, Pleskovic, Boris (Eds.), *Economic Integration and Social Responsibility*. Annual World Bank Conference on Development Economics—Europe, 2004. The International Bank for Reconstruction and Development/The World Bank, Washington DC.
- Pritchett, L., Woolcock, M., 2004. Solutions when the solution is the problem: arraying the disarray in development. *World Dev.* 32 (2), 191–212.
- Riddell, R.C., 2008. Does Foreign Aid Really Work? Oxford University Press, Oxford.
- Rist, G., 2014. The History of Development: From Western Origins to Global Faith. Zed Books, London.
- Röling, N., 1992. The emergence of knowledge systems thinking: a changing perception of relationships among innovation, knowledge process and configuration. *Knowl. Policy* 5 (42). <https://doi.org/10.1007/BF02692791>.
- Röling, N., 2009. Pathways for impact: scientists' different perspectives on agricultural innovation. *Int. J. Agric. Sustain.* 7 (2), 83–94.
- Rose, M., Wadham-Smith, N., 2004. Mutuality, Trust and Cultural Relations. British Council, London.
- Rostow, W.W., 1960. The Stages of Economic Growth: A Non-Communist Manifesto. Cambridge University Press, Cambridge.
- Sanginga, Pascal C., Tumwine, Jackson, Lilja, Nina K., 2006 December. Patterns of participation in farmers' research groups: lessons from the highlands of southwestern Uganda. *Agric. Hum. Values* 23 (4), 501–512.
- Schut, Marc, van Paassen, Annemarie, Leeuwis, Cees, 2013. Beyond the research-policy interface. Boundary arrangements at research-stakeholder interfaces in the policy debate on biofuel sustainability in Mozambique. *Environ. Sci. Policy* 27 (2013), 91–102.
- Schut, M., Klerkx, L., Sartas, M., Lamers, D., Mc Campbell, M., Ogbonna, I., Kaushik, P., Atta-Krah, K., Leeuwis, C., 2016. Innovation platforms: experiences with their institutional embedding in agricultural research for development. *Exp. Agric.* 52 (4), 537–561.
- Shiferaw, B.A., Okello, J., Reddy, R.V., 2009. Adoption and adaptation of natural resource management innovations in smallholder agriculture: reflections on key lessons and best practices. *Environ. Dev. Sustain.* 11 (3), 601–619. <https://doi.org/10.1007/s10668-007-9132-1>.
- Spielman, D., von Grebmer, K., 2006. Public-private partnerships in international agricultural research: an analysis of constraints. *J. Technol. Transf.* 31, 291–300.
- Tennyson, R., Harrison, T., 2008. Under the Spotlight: Building a Better Understanding of Global Business-NGO Partnerships. International Business Leadership Forum, London.
- USAID, 2014. Scaling up the adoption and use of Agricultural Technologies. Global learning and evidence exchange (GLEE), Bangkok, Thailand January 7-9 2014.
- Van den Berg, H., Jiggins, J., 2007. Investing in farmers—the impacts of farmer field schools in relation to integrated pest management. *World Dev.* 35 (4), 663–686.
- Wigboldus, S., Klerkx, L., Leeuwis, C., Schut, M., Muillerman, S., Jochemsen, H., 2016. Systemic perspectives on scaling agricultural innovations. A review. *Agron. Sustain. Dev.* 36, 46.
- Woodhill, A.J., Röling, N., 1998. The second wing of the eagle: the human dimension in learning our way to more sustainable futures. In: Röling Neils, J., Wagemakers, Annemarie Elisabeth (Eds.), *Facilitating Sustainable Agriculture: Participatory Learning and Adaptive Management in Times of Environmental Uncertainty*. Cambridge University Press, UK.