

# Collective action for inclusive value-chain innovation: Implementation and results of the Participatory Market Chain Approach

Douglas Horton, André Devaux, Graham Thiele, Guy Hareau, Miguel Ordinola, Gaston López, Sarah Mayanja and Thomas Bernet



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cip@cgiar.org • www.cipotato.org

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**Authors:**

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# Table of Contents

ABSTRACT.....	III
ACKNOWLEDGEMENTS .....	IV
ABBREVIATIONS AND ACRONYMS .....	V
1. INTRODUCTION .....	1
2. PERSPECTIVES ON INNOVATION, VALUE-CHAIN DEVELOPMENT AND COLLECTIVE ACTION.....	1
2.1. Research versus innovation .....	2
2.2. Agricultural marketing and value-chain development .....	4
2.3. Roles of collective action in innovation and value-chain development .....	5
3. PAPA ANDINA AND THE PMCA .....	6
3.1. Origins and development of the approach .....	7
3.2. PMCA Principles and components.....	8
3.3. What the PMCA does not do .....	12
3.4. PMCA applications .....	13
4. ANALYTICAL FRAMEWORK, METHODS AND SOURCES OF INFORMATION .....	13
4.1. Analytical framework .....	13
4.2. Analysis of cases .....	17
5. CASE SUMMARIES.....	20
5.1. Market development for native potatoes in highland Peru (2003-2004).....	20
5.2. Value-chain innovation with potato, sweetpotato and vegetables in Central Uganda (2005-2007).....	22
5.3. Coffee market development in Peru’s San Martín Department (2007-2008) .....	25
5.4. Conservation and marketing of native potatoes on Bolivia’s Altiplano (2007-2009) .....	26
5.5. Innovation in potato value chains in West Java, Indonesia (2008-2009) .....	28
5.6. Market development for organic and typical regional products in Albania (2009-2011).....	31
5.7. Innovation with indigenous African leafy vegetables in Central Uganda (2011-2013).....	33
5.8. Stimulating innovation in aquaculture value chains in Bangladesh and Nepal (2011-2014).....	35
6. DISCUSSION.....	37
6.1. Drivers of innovation .....	38
6.2. Innovation processes .....	44
6.3. Outcomes.....	46
6.4. Scaling issues.....	51
7. LESSONS .....	55
ANNEX: SUMMARY INFORMATION ON DOCUMENTED PMCA APPLICATIONS .....	59
REFERENCES.....	70
ABOUT THE AUTHORS .....	82

**List of Figures**

Figure 1. Three-phase structure of the PMCA..... 10

Figure 2. PMCA implementation protocol. .... 11

Figure 3. Framework for analyzing PMCA interventions..... 14

Figure 4. Factors that may influence inclusive value-chain innovation processes and outcomes. .... 19

Figure 5. Scores for drivers of innovation; innovation processes; and outcomes in 8 cases. .... 38

Figure 6. New product development triggered by the PMCA in Peru..... 49

# Abstract

Research and development approaches that incorporate elements of collective action, agricultural innovation systems, and value-chain development (VCD) are increasingly popular, but there has been little systematic analysis of their use and results. In this paper, we analyze experiences with a participatory approach for stimulating inclusive innovation in agricultural value chains, known as the Participatory Market Chain Approach (PMCA). Guided by a conceptual framework for analyzing PMCA interventions, we examine cases where the PMCA was applied in value chains for aquaculture, coffee, organic and typical regional products, potatoes and vegetables in Albania, Bangladesh, Bolivia, Indonesia, Nepal, Peru and Uganda. We find that the uses and results of the PMCA were strongly influenced by attributes of the external environment, the targeted value chain and the intervention in which the PMCA was applied.

The PMCA has generally produced the most significant results where: (a) the agricultural and policy environment favored agricultural innovation and VCD; (b) the value chain offered significant potential for value addition or cost reduction; and (c) the PMCA was implemented with a high degree of fidelity to its basic principles in the context of a broader development effort. The active involvement of diverse stakeholders – not only smallholder producers but entrepreneurs along the value chain and relevant service providers – was crucial for stimulating innovation. Because innovation processes are complex and emergent in nature, local teams needed to develop flexible implementation plans and procedures that were adjusted over time in response to emerging opportunities and results. And because the PMCA requires the active engagement of value-chain actors and service providers with diverse, sometimes conflicting, interests, effective facilitation was crucial to the success of PMCA interventions. We found significant benefits of the PMCA frequently emerged long after the intervention had been implemented. This finding highlights the value of assessing interventions that support inclusive innovation several years after project funding ends. Notwithstanding the demonstrated utility of the PMCA in stimulating inclusive innovation in agricultural value chains, the approach has only achieved limited use beyond its original developers. This finding also reflects the both the lack of institutional support and an effective scaling strategy for the PMCA and the enduring challenges to mainstreaming participatory systems approaches in agricultural research and development organizations.

## **Key words**

Collective action, Inclusive innovation, Value-chain development, Agricultural research, Marketing, Linkages, Partnership, Systems Approaches

# Acknowledgements

This report is based on a review of several cases that involved applications of the PMCA in more than a dozen value chains in seven countries of South America, South Asia, Sub-Saharan Africa, and Eastern Europe. It was written by insiders who were involved in the development and implementation of the PMCA and in earlier reviews of the uses of the PMCA. We thank the CGIAR Research Programs on Policies, Institutions and Markets (PIM) and Roots, Tubers and Bananas (RTB) supported by CGIAR Fund Donors <http://www.cgiar.org/about-us/our-funders/> for their support in the literature review and case analysis for this report. We acknowledge Daniel Rodríguez and Paola Flores for providing updated information on some of the cases analyzed. We are especially grateful to Jeffrey Bentley, Paul Engel, Gordon Prain, Marc Schut and Dietmar Stoian for providing valuable comments and suggestions for improving the presentation of our conceptual framework, case analysis, and lessons. Thanks to Zandra Vasquez for her highly professional work in formatting the manuscript and to Christopher Butler and Cecilia Lafosse, of CIP's Communications and Public Awareness Department, for editing and graphics. It is our hope that the findings will help improve the implementation of future interventions in value chain development.

# Abbreviations and Acronyms

ACIAR	Australian Centre for International Agricultural Research
AIS	Agricultural innovation system
ALV	African leafy vegetables
ANEP	Agriculture and Nutrition Extension Project (IFAD-funded project in Bangladesh and Nepal)
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CAD	Center for Development Support, Northern Potosi, Bolivia
CIP	International Potato Center
DFID	Department for International Development, United Kingdom
ENDURE	Expanding Utilization of Roots, Tubers and Bananas and Reducing their Postharvest Losses (project implemented in Uganda)
EU	European Union
FBS	Farmers' Business School
FFS	Farmer Field School
FiBL	Swiss Research Institute of Organic Agriculture
FOI	Fidelity of implementation
FONTAGRO	Regional Fund for Agricultural Development
GIZ	German Agency for Technical Cooperation
IAD	Institutional Analysis and Development
ICIMOD	International Centre for Integrated Mountain Development
iDE	International Development Enterprises
IFAD	International Fund for Agricultural Development
INCOPIA	Project for Promoting the Competitiveness of the Potato Sector in Peru
INIAP	National Institute for Agricultural and Livestock Research (Ecuador)
IVEGRI	Indonesian Vegetable Research Institute
MUZARDI	Mukono Zonal Agricultural Research and Development Institute, NARO, Uganda
NARO	National Agricultural Research Organization, Uganda
NGOs	Non-Government Organizations
NRI	Natural Resources International
PELUM	Participatory Ecological Land Use Management network
PIM	CGIAR Research Programs on Policies, Institutions and Markets (PIM)
PMCA	Participatory Market Chain Approach
PRAPACE	Regional Potato and Sweetpotato Improvement Network in Eastern and Central Africa
PROINPA	Foundation for the Promotion of and Research on Andean Products, Bolivia
PROPANA	Network of Native Potato Producers
R&D	Research and development
RASD	Rural Agency for Sustainable Development, Uganda
RIU	Research Into Use Programme
RTB	CGIAR Research Programs and Roots, Tubers and Bananas



SASA	Sustainable Agricultural Support to Albania (SDC-funded project)
SDC	Swiss Agency for Development and Cooperation
SEDERA	Foundation for Services for Rural and Agricultural Development, Bolivia
SNV	Stichting Nederlandse Vrijwilligers ("Foundation of Netherlands Volunteers")
UN	United Nations
USAID	United States Agency for International Development
VCD	Value chain development

# **Inclusive innovation in agricultural value chains: Lessons from the Participatory Market Chain Approach (PMCA)**

## **1. Introduction**

In recent years, there has been considerable experimentation with research and development (R&D) approaches that draw on the fields of collective action, agricultural innovation systems (AIS), and value-chain development (VCD). However, the uses and results of these approaches have seldom been assessed. In the early 2000s, with support from the Swiss Agency for Development Cooperation (SDC), the International Potato Center's Papa Andina regional program developed the Participatory Market Chain Approach (PMCA) as a novel use of collective action that engaged smallholder farmers, market agents, researchers and other service providers in innovation processes in agricultural value chains (Devaux et al., 2009). Over the past nearly two decades, the PMCA has been applied in value chains for more than 20 agricultural commodities in Africa, Asia, Eastern Europe and Latin America. The present paper seeks to contribute to knowledge on the use of collective action to promote inclusive innovation in agricultural value chains by taking stock of experiences with the PMCA. Our analysis examines the origins of the approach, how it has been applied in different settings, and how context and implementation have influenced the results obtained in each setting. Based on this analysis, we formulate lessons for improving future research and development efforts to promote inclusive innovation in agricultural value chains.

## **2. Perspectives on innovation, value-chain development and collective action**

One of the main challenges for research organizations everywhere is to produce and promote useful knowledge that supports sustainable development (Cash et al., 2003; Kristjanson et al., 2009; Anadon et al., 2016; Clark et al., 2016). When the global network of agricultural research centers known as CGIAR was established in the early 1970s, it was assumed that new information and technologies would flow from research programs through extension to farmer adopters, leading to increased food production and reduced hunger and poverty (Biggs, 1990; Hall et al., 2000). However, many technologies produced on research stations remained "on the shelf" and a disproportionate share of the benefits of technological change accrued to relatively well-off farmers in well-endowed areas with good access to markets (Ashby, 2009; Chambers, 2009). Increased recognition of the limitations of mainstream R&D approaches has stimulated new

thinking on innovation processes, on the importance of agricultural value-chains, and on the roles of collective action in innovation and VCD.

### **2.1. Research versus innovation**

Beginning in the 1970s, agricultural researchers began to experiment with participatory approaches for linking research more effectively with the intended beneficiaries, particularly smallholder farmers. Several participatory approaches were developed, including ones centered on cropping systems, farming systems, participatory rural assessment, on-farm client-oriented research, and participatory plant breeding. All these approaches assumed that farmer involvement and communication with researchers would lead to more relevant research and larger impacts on agricultural yields, production and rural livelihoods (Collinson 2000; Ashby 2009; Hall 2009; Douthwaite and Hoffeaker 2017).

In the 1990s, academics and agricultural researchers began exploring the use of systems approaches that went beyond linking researchers and farmers (Klerkx et al., 2012). Work with “Agricultural Knowledge and Information Systems” (Röling, 1990) informed the development of a participatory approach to stimulate agricultural innovation known as “Rapid Appraisal of Agricultural Knowledge Systems” or RAAKS (Engel and Salomon, 2003). Beginning around 2000, an “agricultural innovation systems” (AIS) model began to emerge that shifted the focus from *research* – the production of new knowledge, which might or might not be put into use – to *innovation* – changes in the production and marketing of goods and services, which might or might not be driven by research (Hall et al., 2001, 2006; World Bank, 2007, 2012; Klerkx et al., 2009, 2012).

According to Hall et al. (2003: 219-220),

*“At its simplest the [innovation system] concept recognizes that innovations emerge from systems of actors. These systems are embedded in an institutional context that determines how individual actors behave and how they interact with other elements in the system.*

*Successful systems are characterized by:*

- *continuous evolutionary cycles of learning and innovation;*
- *combinations of technical and institutional innovations;*
- *interaction of diverse research and non-research actors;*
- *shifting roles for information producers, information users and transfers of knowledge dependent on a need basis; and*

- *an institutional context that supports interactions and knowledge flows between actors.*"

Klerkx et al. (2010: 390) note that "in the AIS approach, innovation is considered the result of a process of networking and interactive learning among a heterogeneous set of actors, such as farmers, input industries, processors, traders, researchers, extensionists, government officials, and civil society organizations." Interventions that seek to foster innovation often rely on "innovation brokers" to stimulate interaction and social learning among relevant stakeholders. Innovation brokers do not engage directly in innovation processes but enable others to innovate (Klerkx et al., 2009). Based on a review of experiences in Sub-Saharan Africa, Adejuwon (2016) notes that the attributes of successful innovation brokers include status, legitimacy and reputation in the local setting; connections with useful individuals and resources outside the region; and the ability to recognize the value of new information, assimilate it and apply it to commercial ends.

AIS approaches are frequently viewed as ways to stimulate inclusive innovation, which has been described as "the pursuit of innovation that has social aims, and local context, at its heart. One can think of it as either – and both – a more inclusive approach to innovation, or a more innovative approach to driving social inclusion" (Glennie et al., 2020: 7). Inclusive innovation focuses on equitable outcomes and the need for more active governance of innovation.

There has been considerable experimentation with participatory research and AIS approaches in the context of "research-for-development" projects that have sought to enhance the relevance of agricultural research and its contributions to innovation. However, the core programs of agricultural research, extension and education organizations have continued to reflect traditional, linear innovation models (Ashby, 2009; Hellin, 2012; World Bank, 2012; Schut et al., 2015; Devaux et al., 2018). As Hall (2009: 31) noted a decade ago, "there is still an uncomfortably large gap between what is known about enabling innovation for development and what is evident in mainstream policies and practices." The situation has changed little since then (Banerjee et al., 2019).

There are both internal and external sources of resistance to the use of participatory research and AIS approaches in agricultural research organizations (Ashby, 2009; Klerkx et al., 2009; Vanloqueren and Baret, 2009; Schut et al., 2015). These approaches present serious challenges for agricultural

researchers and research organizations that focus on bio-physical research and have limited capacity for socio-economic research and innovation brokerage. Recent trends in funding for agricultural R&D (and for international development more broadly), also discourage use of participatory, systems-oriented approaches. Whereas funders favor projects with short implementation periods, sharply defined outputs and precise timelines, budgets and performance indicators; systems-oriented interventions that support agricultural innovation require more stable and flexible funding and management arrangements (Glover et al., 2019; Bentley in press).

## **2.2. Agricultural marketing and value-chain development**

Agricultural researchers have traditionally focused on boosting crop and livestock yields and have considered marketing to be outside of their domain. However, domestic value chains that generate low incomes for smallholders as well as downstream traders, processors and retailers often discourage investments in new technologies that could benefit smallholders as well as other value-chain actors (Devaux et al., 2018; Soullier et al., 2019).

A value chain can be defined as “a set of interconnected, value-creating activities undertaken by an enterprise or group to develop, produce, deliver and maintain a product or service” (World Bank, 2007: 24). Inclusive VCD refers to the development of value chains in ways that involve and benefit marginalized actors, such as smallholder farmers, small businesses, and landless laborers.

Since around 2000, many development agencies have adopted VCD as a key element of their poverty-reduction strategies (Humphrey and Navas-Alemán, 2010; Stoian et al., 2016; Hainzer et al., 2019). Whereas most participatory research and AIS approaches have been developed and used in the context of agricultural research programs, most VCD approaches have been developed and used in the context of development programs. Recently some agricultural research organizations have begun to experiment with VCD approaches. However, as with the AIS approaches discussed above, most work with VCD approaches has been carried out in the context of ad hoc research-for-development projects, rather than in the core programs of agricultural research organizations.

There is little systematic knowledge of how best to design and manage inclusive VCD interventions. A recent review of local value-chain interventions notes that “the interaction between context,

socio-economic constraints and intervention strategies is still a poorly understood feature of value-chain interventions” and concludes that better understanding of these interactions is crucial to their success (Hainzer et al., 2019: 369). In the present paper we pay particular attention to these interactions and their implications for intervention design, management, and evaluation.

As noted by Hall and colleagues (World Bank, 2007: 9), innovation systems and value chains often share partners and are highly complementary and overlapping. AIS approaches may be especially useful in the rapidly emerging value chains for high-value products including fresh fruits and vegetables, organic produce, processed foods, aquaculture, medicinal plants and cut flowers. However, the complementarity of innovation systems and value-chain approaches has seldom been explored and the results of interventions that combine multi-stakeholder processes and VCD have seldom been documented (Kilelu et al., 2017). The present paper seeks to contribute to knowledge on the use and results of integrated approaches for stimulating agricultural innovation and VCD.

### **2.3. Roles of collective action in innovation and value-chain development**

Collective action refers to voluntary action taken by a group to pursue common interests or achieve common objectives. In collective action, members may act on their own, but more commonly they act through a group or an organization. They may act independently or with the encouragement or support of external agents from governmental bodies, NGOs or development projects (Meinzen-Dick and Di Gregorio, 2004).

Social capital, a central concept in the collective action literature, was defined by Putnam (1995: 664-665) as “features of social life – networks, norms and trust – that enable participants to act together more effectively to pursue shared objectives.” Three distinct types of social capital have been identified (Cofré-Bravo et al., 2019: 55):

- *Bonding social capital* refers to relatively strong, trusting and cooperative relationships between members of a closed network in which participants are similar in sociodemographic terms. Bonding social capital is essential for a farmer cooperative to perform well.
- *Bridging social capital* refers to the looser connections between separate but similar social groups, such as different producer cooperatives, marketing associations or consumer groups.
- *Linking social capital* involves “boundary spanning,” with some network members “able to facilitate connections between disparate networks and social hierarchies.” It refers to the

generally weaker relationships between people from different cultures or social classes who have significantly different levels of power or authority. Linking social capital is essential for smallholder farmers to work effectively with researchers, other agricultural service providers, supermarket managers or government officials.

King et al. (2019) note the importance of bridging and especially linking social capital for innovation processes that involve disparate groups working across traditional social, economic, and organizational boundaries. These types of social capital are also essential for participatory VCD approaches that involve smallholder farmers, traders and other value-chain actors with distinct resource endowments, socio-economic positions and stakes in the chain.

There is an extensive literature on the role of collective action in managing natural resources such as forests, fisheries, grazing lands, and irrigation water. This literature deals mainly with the development and use of bonding social capital. In contrast, there have been few studies of collective action in the context of agricultural marketing or VCD, where bridging and linking social capital are more central concerns.

In 2009, a special issue of the journal *Food Policy* brought together several case studies of collective action for smallholder market access (Markelova et al., 2009). Nearly all the cases presented involved farmers' organizations. Devaux et al. (2009), which analyzed the use of the PMCA and multi-stakeholder platforms in Andean potato value chains, was the only one that explored collective action and the development of bridging and linking social capital among *diverse* value chain actors (including not only farmers but market agents and service providers) to promote inclusive innovation and VCD. The present paper expands and updates our analysis of experiences with the PMCA by examining additional cases in other regions and value chains.

### 3. Papa Andina and the PMCA

*“The PMCA ... aims to stimulate market chain innovations by involving different stakeholders within a well-structured and demand-oriented process.... It is an instrument for facilitating change in market chains that lack coordination [by] creating an environment that fosters interaction among market chain actors, promotes mutual learning and trust and stimulates shared innovation”* (Bernet et al., 2006: viii, 2).

### 3.1. Origins and development of the approach

The PMCA was developed in the context of *Papa Andina*, a regional initiative that worked to foster innovation and reduce poverty among potato producers in the Andean region of South America (Devaux et al., 2009). For many years, SDC supported potato R&D in the Andes. In 1998, Papa Andina was established to consolidate these efforts in a regional program hosted by the International Potato Center (CIP).<sup>1</sup> SDC supported Papa Andina until 2009 (Devaux et al., 2011). Drawing on CIP's extensive work with participatory research and technology development in the Andes (Ortiz et al., 2020), Papa Andina developed a strategy to "increase incomes [of resource-poor farmers and other value-chain actors] by building on existing livelihood strategies in the high Andes" (Meinzen-Dick et al., 2009: 243-244), rather than on the transfer of externally generated solutions (Sarapura et al., 2017). Papa Andina worked with a network of more than 30 institutional partners that were embedded within the national systems of Bolivia, Ecuador and Peru.

Papa Andina operated as a "second-level innovation broker," in that it did not facilitate national or local-level innovation processes but supported the work of national and local partners who took the lead in brokering innovation processes in their countries and local jurisdictions (Devaux et al., 2010). These partners, in turn, worked with a growing number of rural households and small and medium-sized market intermediaries, estimated to be around 4,000 in 2009 (Meinzen-Dick et al., 2009: 236). As these participants influenced others in their communities, the number of indirect beneficiaries grew exponentially, particularly in Peru (Proexpansion, 2011; Horton and Samanamud, 2013).

In line with the dominant strategy for international agricultural research and development at the time (de Janvry and Kassa, 2004), Papa Andina was originally designed as a regional research program. However, the coordinators soon realized that to achieve significant results Papa Andina would need to go beyond agronomic research and deal with issues of inclusive innovation and VCD.

Farmer organization is commonly promoted to enhance smallholder market access and VCD (Markelova et al., 2009). However, Papa Andina was searching for a way to stimulate innovation in value chains for potatoes, and this would require working with *diverse* value-chain stakeholders. In

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<sup>1</sup> CIP is one of 15 international agricultural research centers affiliated with CGIAR (<https://www.cgiar.org>).



2003, Papa Andina began experimenting with the participatory systems approach RAAKS (Engel and Salomon, 2003). While this approach proved useful for engaging smallholder farmers, market agents, researchers and other service providers in exercises that identified market constraints and opportunities, it did not include steps for exploiting the identified opportunities by developing new products or processes. As steps and tools were added for developing commercial innovations, a new approach emerged, which became known as the PMCA.

### 3.2. PMCA Principles and components

The PMCA is what Vereijssen et al. (2017) refer to as a “co-innovation approach,” with the overarching goal of improving the use of research for development. The PMCA engages agricultural researchers and smallholder farmers along with other value-chain actors, public officials and service providers<sup>2</sup> in facilitated group processes aimed at identifying and developing business opportunities.

The PMCA is guided by the following key principles: (Bernet et al., 2006; Ordinola et al., 2018):

- The focus of a PMCA exercise should be on commercial innovation, as a driver for subsequent technical and institutional innovation.
- It is essential to engage diverse value-chain stakeholders and service providers, including relevant NGOs and specialized firms, throughout the PMCA process.
- Facilitators (usually members of research or development organizations) play central roles in guiding multi-stakeholder processes, helping to identify opportunities for innovation, engaging relevant stakeholders in the PMCA process, arranging for needed technical inputs, communicating internally and externally and mediating conflicts.
- Facilitators should not engage directly in innovation or commercial activities.
- The role of facilitators should decrease over time, as stakeholders assume more responsibility for innovations and marketing.
- It is essential to build wide support for the PMCA process and the resulting innovations, through effective communication, advocacy and engagement of influential individuals from government and the private sector.
- The success of a PMCA exercise depends on the extent to which trust is built up among relevant actors, useful knowledge is exchanged, and ideas are transformed into practical action leading to the development of new or improved products or services.

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<sup>2</sup> Service provider is an umbrella term that covers, e.g., agronomists, post-harvest specialists, food technologists, marketing specialists, extension agents, financiers and enterprise development professionals.

English and Spanish versions of a *PMCA User Guide* were published (Bernet et al., 2006, 2010), along with a Spanish-language trainers' guide (Antezana et al., 2008). Whereas most guides for VCD focus on analysis of chains and improvement of chain governance, the PMCA guide focuses on stimulating inclusive innovation (Donovan et al., 2013, 2016). Process facilitators play key roles in guiding the PMCA process, particularly in the early phases and creating an enabling environment that fosters communication, mutual learning and co-development of new products and services. They also help translate concepts and ideas between groups with different backgrounds (and sometimes different languages) and mediate disputes between participants with different stakes in the PMCA exercise. The costs of PMCA implementation are usually covered by R&D projects that support its implementation and follow-up activities as part of a broader development effort.

The PMCA User Guide outlines a three-phase participatory implementation process (Figure 1).

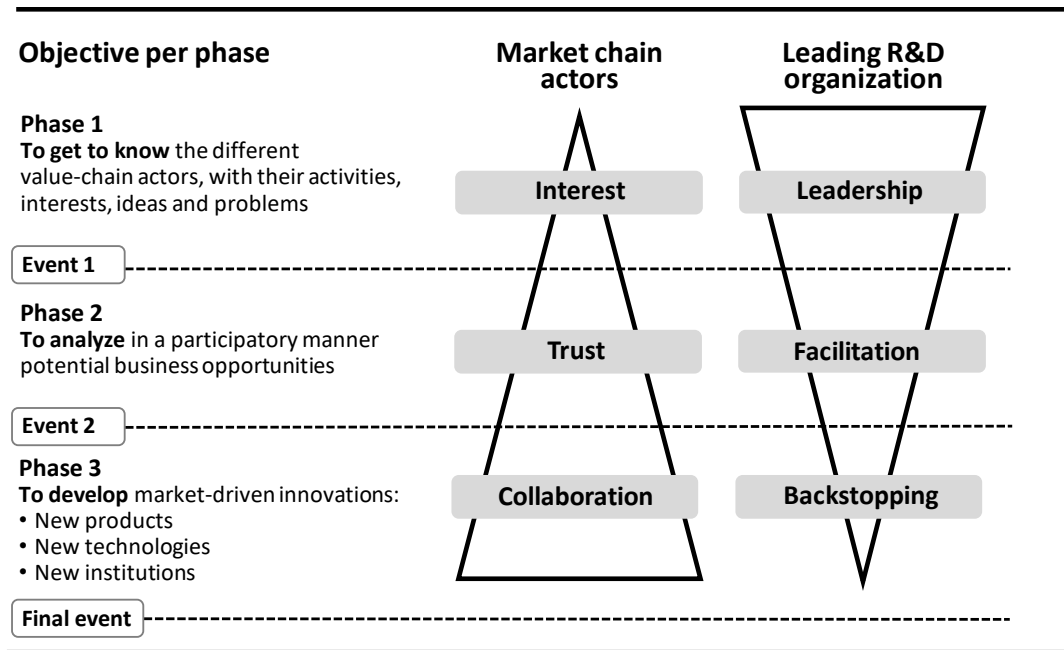
**Phase 1. Familiarization with the value chain and the key actors.** The emphasis is on qualitative diagnostic research. This phase is expected to take two to four months and may involve 20 to 40 interviews with diverse market chain actors, representatives of research organizations and other service providers. A public event at the end of the phase brings together the individuals involved so far and others who could make useful future contributions to the PMCA exercise, to discuss results and brainstorm possible business opportunities and future PMCA activities.

**Phase 2. Joint analysis of potential business opportunities.** Thematic groups are established to explore potential business opportunities. Trained staff from the lead R&D organization facilitate a series of meetings (perhaps six to ten) for each group. The main challenges are to engage a wide range of relevant stakeholders – including market entrepreneurs – while keeping participants focused on identifying and exploiting market opportunities (rather than, for example, production problems). Specialized market studies may also be commissioned. At the end of the phase, the market opportunities are discussed in a second public event, to which a wider audience is invited, to get feedback from new people with new ideas and experience, and to encourage them to join Phase 3.

**Phase 3. Development of market-driven innovations.** The final phase focuses on the development of specific innovations that will be used by specific value-chain actors. It is crucial that value-chain actors lead the innovation processes in the thematic groups. The time needed may be three to six months, depending upon the complexity of the innovation and the capacity of the group. Phase 3 closes with a large public event to which

an even much wider group is invited to present the different innovations that have emerged to date. These are generally new or improved products but may also include new production technologies or marketing arrangements. To heighten the social and political impact of this event, invitees should include political officials, donor representatives, commercial leaders, and members of the press.

**Figure 1.** Three-phase structure of the PMCA.



**Source:** Bernet, Thiele and Zschocke, 2006.

Throughout the PMCA process, it is essential that the coordinators *facilitate* innovation processes rather than *take responsibility* for the work that needs to be done. After completion of a PMCA exercise, further support from the facilitating R&D organization may be useful to support emerging innovation processes.

Based on the user guide and early experiences with its use, a PMCA implementation protocol was prepared that identifies the main structural and process components of the approach (Figure 2). Following Zvoch (2012), “structural components” refer to the main activities and tasks and “process

components” refer to how and why these tasks are carried out and the roles and behaviors of the individuals and organizations involved.

**Figure 2.** PMCA implementation protocol.

<b>Structural components<sup>3</sup></b>	<b>Processes components</b>
<b>Phase 1. Familiarization with the value chain &amp; key actors (3 months)</b>	
Actor mapping and qualitative diagnosis of the value chain, to identify problems and potential business opportunities	The facilitator leads activities that stimulate the interest of diverse value-chain actors to participate in the PMCA exercise. The emerging PMCA team gets to know the value chain, key chain actors & their views.
Public event at end Phase 1	Key value-chain actors & stakeholders participate in the event, to learn about the study results & the PMCA & to share their own knowledge & views. Potential business opportunities are identified. Thematic groups are established, and their members discuss possible innovations.
<b>Phase 2. Analysis of potential business opportunities (3-4 months)</b>	
Thematic group meetings approx. every 15 days with diverse value-chain actors, to analyze market opportunities and costs and to begin business planning	Diverse value-chain actors interact among themselves & with other stakeholders to share knowledge, begin building trust, jointly identify potential business opportunities & develop 1 or more business plans. Facilitators seek the active participation of diverse value-chain actors in decision-making, to ensure their understanding & their commitment to the process & the emerging innovations. Value-chain actors gain knowledge of the value chain & the roles & views of other actors along the chain.
Public event at end of Phase 2	Progress is shared and new participants & allies are encouraged to join Phase 3, to enrich knowledge & resource sharing & ensure success of joint activities/innovation processes.
<b>Phase 3. Development of market-driven innovations (3-6 months)</b>	
Thematic group meetings approx. every 15 days with diverse actors, to develop specific innovations, organize technical and market studies, Product development & testing, and obtaining needed permits & licenses.	Value-chain actors play leading roles in joint activities to develop new business opportunities. Small farmers & others increase their knowledge of the value chain & the roles of different actors along the chain. Facilitators stimulate (a) participation of diverse stakeholders; (b) engagement of entrepreneurs in development of innovations that they will take forward later; & (c) mobilization of resources & support needed to ensure successful innovation.
Public event at end of Phase 3	Innovations are launched and celebrated. Members of the press, opinion leaders, and relevant political authorities participate, to ensure ample communication and diffusion of results of the intervention, to develop commitment for needed follow-up.

<sup>3</sup> Following Zvoch (2012), structural components refer to key tasks and process components indicate how and why these tasks are to be carried out.

**Source:** Based on Horton et al., 2013b.

Papa Andina developed a “horizontal evaluation” approach to strengthen communication and collegial relations within the Papa Andina network while improving work on the PMCA and other new R&D approaches (Thiele et al., 2006, 2007). Horizontal evaluations combine elements of peer and external evaluation. Several of them were carried out in the Andes and principles of horizontal evaluation also guided reviews of PMCA work in Uganda and Indonesia. In addition to contributing to program improvement, these exercises also provided valuable information and insights for the present study.

### **3.3. What the PMCA does not do**

Whereas many VCD approaches seek to strengthen the capacity of farmer organizations to work in a more collaborative, entrepreneurial manner and perform marketing functions more effectively, the PMCA does not include specific measures for strengthening farmer organizations. Instead, it focuses on strengthening linking social capital and the development of networks among diverse value-chain actors and agricultural service providers with the goal of stimulating inclusive innovation.

The PMCA does not include specific strategies and components for promoting gender equality. However, as pointed out by Sarapura et al. (2017), through its emphasis on building on the assets of poor men and women, mobilizing local as well as scientific knowledge, and developing market opportunities that benefit smallholder farmers as well as small- and medium-sized market intermediaries, the PMCA has contributed to the welfare and empowerment of both men and women. During the applications of the PMCA in Uganda, CIP researchers realized that the approach should pay more attention to gender and generational differences among value chain actors. To improve the approach’s potential contributions to ensuring that participants of both genders and all ages have equitable access to opportunities and benefits along value chains, CIP researchers and partners in Africa and the Andes developed a series of practical tools to integrate gender into the PMCA (Mayanja et al., 2016).

### 3.4. PMCA applications

The PMCA was developed by Papa Andina to promote innovation in potato value chains in the Andean region of South America. But it has also been applied in other value chains and regions of the world. It is impossible to know all the instances in which the PMCA has been used or where it has inspired participatory VDC under other names. Internet searches, project reports, research publications and personal communications indicate that the PMCA has been used, with varying degrees of fidelity, in Africa, Asia, Eastern Europe and Latin America in value chains for, aquaculture, cassava, coffee, dairy products, fruits, handicrafts, hot peppers, organic and “typical regional” products,<sup>4</sup> plantains, potatoes, sesame, sweetpotatoes, tomatoes, vegetables, wine and yams. Annex 1 presents summary information on reported applications of the PMCA, including information on the value chain and location, the implementation period, the program or project in which the PMCA was used, the main funding sources, and references available on the case. In this Working Paper, our analysis focuses on eight of the best-documented cases, for which sufficient information is available to apply the analytical framework presented in Section 4.

## 4. Analytical framework, methods and sources of information

### 4.1. Analytical framework

Our analysis of experiences with the PMCA is guided by a framework that is based on the Institutional Analysis and Development (IAD) framework developed by Ostrom and colleagues at the Workshop in Political Theory and Policy Analysis at Indiana University (Ostrom, 2005). Devaux et al. (2009), Thiele et al. (2011a), Horton et al. (2013b), and Asai et al. (2018) adapted the IAD framework for analysis of value-chain interventions, multi-stakeholder platforms, innovation processes and crop-livestock integration beyond the farm level. For the present analysis, we further adjusted the IAD framework to highlight attributes of the value chain and the intervention that have influenced innovation processes and the outcomes.

#### ***Components of the framework***

Our framework (Figure 3) has five main components:

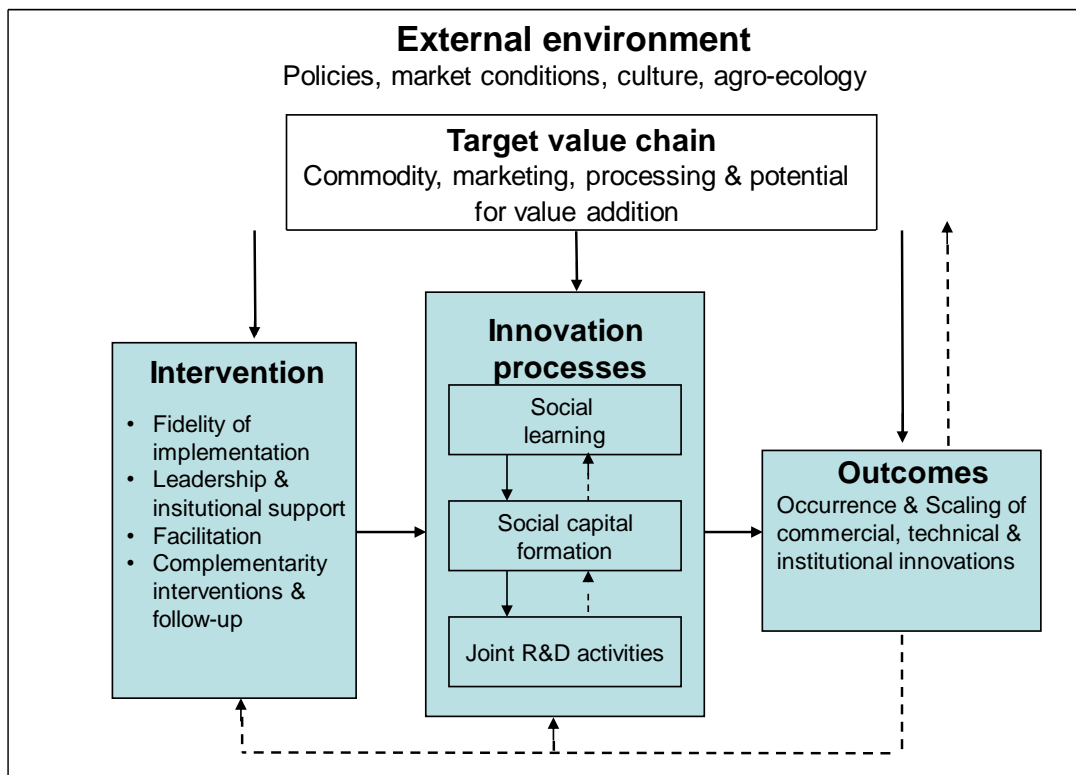
1. *The External Environment*: Attributes of the natural, political and economic environment in which the PMCA is applied

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<sup>4</sup> This term is used in Albania to refer to a wide range of home-made products of known origin, including pasta, goat cheese, nuts, honey, mushrooms, tea, and dried fruits and vegetables.

2. *The Value Chain*: Attributes of the commodity, its processing and marketing and the potential for value addition
3. *The intervention*: How the PMCA is implemented and the presence of complementary interventions and follow-up
4. *Innovation Processes*: Participant interactions, social learning, social capital formation and joint R&D activities
5. *Outcomes*: Commercial, technical and institutional innovations

**Figure 3.** Framework for analyzing PMCA interventions.



**Source:** Inspired by Ostrom (2005) and Devaux et al. (2009).

*The External Environment* refers to the natural, political and economic environment in which the PMCA has been applied and which may influence innovation processes and outcomes. Key attributes of the external environment include local agroecology and livelihood systems, public policies, general market conditions and the nature and extent of institutional support for agriculture and value-chain development.

*The Value Chain* refers to the commodity and how it is marketed, processed and utilized. Key attributes of the value chain that may influence innovation processes and outcomes include the role and importance of the commodity in the farm economy, the extent and ways in which the commodity is marketed and market arrangements, whether or not the commodity is processed and the potential for value addition and cost saving.

*The Intervention.* Important aspects of the intervention include the fidelity of implementation (FOI) of the PMCA, institutional support and leadership, process facilitation, tailoring implementation procedures to fit local conditions, and the presence of complementary interventions and follow-up after completion of the PMCA exercise. FOI refers to the extent to which the basic principles of the PMCA were applied in practice. The PMCA User Guide is not a recipe book but a set of principles, guidelines and a collection of methods that facilitators can draw on to develop their own local implementation procedures. The Guide emphasizes the importance of, social learning, strengthening social capital among diverse value-chain actors and service providers, and working with entrepreneurs to develop commercial innovations that respond to market demands. For this reason, our analysis pays particular attention to the facilitation of group processes focused on commercial innovation. Early work with the PMCA revealed the importance of complementary interventions, such as agricultural policies, strengthening farmer organizations or promoting innovations after completion of the PMCA. For this reason, we also look at the extent to which the PMCA was complemented with other appropriate interventions.

*Innovation Processes.* When the PMCA is implemented, participants interact and engage in activities that promote social learning, social capital formation, and joint R&D activities. Kruijssen et al. (2009) discuss the importance of social learning and social capital formation for collective action in the context of value chains. Social learning refers to the process through which groups of people learn together, by jointly defining problems, searching for and implementing solutions, and assessing the value of solutions for specific problems (Koelen and Das, 2002). It brings about a shift from “multiple cognition” to “collective cognition.” As a result of interaction, individuals who begin with very different perceptions of the current situation and the potential for change may develop common, shared perspectives, insights and values. Dialogue and social learning foster collective cognition and strengthening of trust and social capital, all of which are crucial for effective joint



action and innovation. As King et al. (2019: 125) note, “trust is the relational glue that enables or constrains social interactions, knowledge sharing and innovation processes.” For this reason, development of linking social capital among individuals and groups with different stakes in value-chain innovation is critical for the success of a PMCA exercise.

*Outcomes.* The main expected outcomes of the PMCA are *commercial innovations* –new or improved products that are successfully marketed. Commercial innovation requires that private-sector actors capitalize on business opportunities and launch new or improved products. Commercial innovation is viewed as a crucial outcome that triggers technical, institutional and further rounds of commercial innovation. *Technical innovation* refers to the introduction and use of new practices in commodity production, processing or trading; and *institutional innovation* refers to novel, useful and legitimate changes in the norms, rules and organizations that govern transactions. The success of the PMCA is viewed mainly in terms of the development and scaling of commercial innovations, which are expected to trigger technical and institutional innovations.

### ***Drivers of innovation***

In our framework, the main drivers of inclusive innovation in agricultural value chains are found in the external environment, the target value chain and the intervention in which the PMCA is applied. As illustrated in Figure 3, attributes of the external environment may influence the value chain and the intervention as well as innovation processes and outcomes. Some policy regimes encourage inclusive VCD whereas others, which may promote state enterprises or plantation agriculture, discourage it. Policy support is also critical for the success of a PMCA intervention. Attributes of the target value chain also influence the performance of interventions as well as innovation processes. A value-chain intervention for an export crop will need to address different things (e.g., international testing or certification) than one for domestically marketed staples. Innovation is also more likely in value chains that generate substantial value added than in subsistence-oriented ones.

Once the target value chain has been selected, the external environment and the chain can be considered “exogenous variables,” largely beyond the control of those who implement the PMCA. From then on, the main “endogenous variables” under the control of the project team are the

fidelity of implementation of the PMCA, leadership and institutional support for the exercise, facilitation of group processes and the presence or absence of complementary interventions and follow-up measures. Adherence to the basic principles of the PMCA, commitment and support from the government and the private sector, good facilitation and follow-up after completion of the PMCA are expected to increase the likelihood of social learning, formation of social capital (especially linking social capital) and joint R&D activities, which, in turn, are expected to produce commercial, technical and institutional innovations.

### ***Feedback loops***

As shown in Figure 3, outcomes can potentially influence the continued implementation of the PMCA, innovation processes, the value chain, and even the external environment. Successful commercial innovation, for example, may stimulate technical and institutional innovation processes that expand commodity production, increase product quality or result in new marketing arrangements. Success can encourage value-chain actors to invest time and resources in developing other new products (e.g., second- or third-generation commercial innovations) and policy makers to support future interventions that support inclusive VCD. On the other hand, if the PMCA triggers little or no useful change, it may discourage farmers, traders, processors or development agencies from supporting or participating in future interventions.

Based on previous research and our own work with the PMCA, we have identified nine groups of factors within the external environment, the value chain and the intervention that may influence the implementation and outcomes of the PMCA. These factors, presented in Figure 4, are highlighted in the case writeups and analysis in Sections 5 and 6.

## **4.2. Analysis of cases**

In this paper, we analyze eight cases for which published documentation provides sufficient information for use of our analytical framework:

- Case 1: Market development for native potatoes in highland Peru (implemented from 2003 to 2005)
- Case 2: Value-chain innovation with potato, sweetpotato and vegetables in Central Uganda (2005-2007)
- Case 3: Coffee market development in Peru's San Martin Department (2007-2008)
- Case 4: Conservation and marketing of native potatoes on Bolivia's Altiplano (2007-2008)

- Case 5: Innovation in potato value chains in West Java, Indonesia (2008-2009)
- Case 6: Market development for organic and typical regional products in Albania (2009-2011)
- Case 7: Innovation with indigenous African leafy vegetables in Central Uganda (2011-2013)
- Case 8: Stimulating innovation in aquaculture value chains in Bangladesh and Nepal (2011-2014)

Two other cases documented by Horton et al. (2011, 2013b) involving dairy products in Bolivia and yams in Colombia were not included in the present study, to limit the amount of case study materials presented and because we felt they would add little additional relevant information for our comparative case analysis.

The cases analyzed involve more than a dozen value chains in seven countries in South America, South Asia, Sub-Saharan Africa and Eastern Europe. The dates shown indicate when the PMCA was implemented in each case. The eight case summaries presented in Section 5 include information on the context or external environment in which the PMCA was applied, the value chain, the intervention within which the PMCA was implemented, the innovation processes that took place and the main outcomes.

Following Yin's (2018) comparative case study approach, we summarized available information related to the main elements in our analytical framework for the eight cases. Based on these case summaries and additional information from the original sources (Annex Table 1), the three lead authors (Horton, Devaux and Thiele), who have extensive knowledge of the cases and previous analyses, independently scored the following variables for each case:

- three attributes of the external environment, two attributes of the value chain and five attributes of the intervention (Figure 4);
- the innovation processes that took place; and
- the resulting commercial, technological and institutional innovation.

After discussing differences in the individual scores and their significance, we carried out a second round of scoring. Mean scores for each of the variables were then calculated and summarized in Figure 5 (in Section 6).

**Figure 4.** Factors that may influence inclusive value-chain innovation processes and outcomes.

<p><b>ATTRIBUTES OF THE EXTERNAL ENVIRONMENT*</b></p> <ol style="list-style-type: none"> <li>1. <b>Agroecological setting &amp; livelihood systems</b></li> <li>2. <b>National policies &amp; strategies, general market conditions (not commodity-specific)</b></li> <li>3. <b>History, culture &amp; institutional support</b> <ul style="list-style-type: none"> <li>• Social or cultural factors that may influence collective action, innovation or VCD</li> <li>• Previous experiences with collective action &amp; VCD</li> <li>• Presence &amp; role of R&amp;D organizations in the area/chain</li> </ul> </li> </ol> <p><b>ATTRIBUTES OF THE VALUE CHAIN*</b></p> <ol style="list-style-type: none"> <li>4. <b>The commodity &amp; its marketing</b> <ul style="list-style-type: none"> <li>• Role &amp; importance of the commodity in the farm economy (home consumption &amp; sales)</li> <li>• Extent of processing / value addition</li> <li>• Marketing institutions &amp; arrangements</li> <li>• Local, national or international market</li> </ul> </li> <li>5. <b>Potential for value addition, cost reduction &amp; market expansion</b> <ul style="list-style-type: none"> <li>• Potential demand for the product</li> <li>• Potential for change in consumer perceptions of the commodity</li> <li>• Potential for product differentiation (e.g., through labeling, branding, packaging &amp; processing)</li> <li>• Potential for cost-reduction</li> </ul> </li> </ol> <p><b>ATTRIBUTES OF THE INTERVENTION</b></p> <ol style="list-style-type: none"> <li>6. <b>Fidelity of implementation</b> <ul style="list-style-type: none"> <li>• The exercise is implemented in accordance with the PMCA's basic principles</li> <li>• The main structural &amp; process components are present</li> <li>• Active engagement of key stakeholders, including small farmers, traders &amp; processors, R&amp;D organizations &amp; other service providers</li> </ul> </li> <li>7. <b>Leadership and institutional support</b> <ul style="list-style-type: none"> <li>• High-level decision maker supports the intervention</li> <li>• Stable leadership for the intervention</li> <li>• Emergence of leaders within the value chain who take responsibility for innovation</li> </ul> </li> <li>8. <b>Facilitation</b> <ul style="list-style-type: none"> <li>• Facilitators are committed to the objectives &amp; principles of the PMCA</li> <li>• Facilitators have status &amp; legitimacy, as well as the knowledge, attitudes &amp; skills needed to guide group processes</li> <li>• Facilitators guide development of appropriate implementation procedures to fit local context</li> <li>• Facilitators arrange for needed training &amp; technical support to address technical, marketing, regulatory &amp; other challenges as they arise</li> </ul> </li> <li>9. <b>Complementary interventions &amp; follow-up</b> <ul style="list-style-type: none"> <li>• The intervention was complemented with other relevant interventions or services?</li> <li>• The intervention was part of a larger VCD or sector-development effort?</li> <li>• There was follow-up &amp; support for innovators and innovation processes after completion of the intervention.</li> </ul> </li> </ol>
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**Source:** Authors, inspired by Agrawal (2001) and Devaux et al. (2009). \* Attributes of the external environment and the commodity chain refer to conditions prior to the intervention.

## 5. Case Summaries

### 5.1. Market development for native potatoes in highland Peru (2003-2004)

*External environment.* After years of insecurity and economic stagnation, since the late 1990s, political stability, export opportunities, improvements in rural transportation and expanding cell phone use have all stimulated agricultural production and marketing in the Peruvian highlands, where potato is the main crop. There is a long tradition of potato research and development, but research is lacking on the topics of developing and disseminating high-yielding “improved” varieties, chemical fertilizers and pesticides, and the needs of many smallholders growing native potatoes with few purchased inputs.

*Value chain.* Prior to the intervention, large-scale farmers tended to cultivate improved potato varieties for sale in urban markets, and smallholders tended to grow native varieties for home consumption and sale in local and regional markets. Few native potatoes were consumed in large cities or sold in supermarkets. Smallholders were generally wary of market intermediaries, who had superior market knowledge and bargaining power particularly in isolated rural areas. Since the 1990s, the high quality of Peruvian cuisine and potatoes have become internationally recognized and a source of national pride, stimulating demand for native potatoes.

*PMCA implementation and innovation processes.* From 2001 to 2010, with support from SDC and in collaboration with Papa Andina, the Project for Innovation and Competitiveness of the Potato (INCOPA) implemented a comprehensive program to improve the competitiveness of Peru’s potato sector. INCOPA worked with more than 20 public, private, and non-governmental organizations to stimulate potato production and marketing. When a survey identified strong market potential for native potatoes, the PMCA was used to develop new products and markets for native varieties (Ordinola et al., 2011). After completion of the PMCA, INCOPA continued to support development of Peru’s potato sector, through work with multi-stakeholder platforms, knowledge sharing, public awareness, policy influence, and capacity development for local organizations.

The PMCA provided a diverse group of stakeholders of the native potato value chain their first opportunity to explore options and develop innovations that could be of mutual benefit. Thematic group meetings engaged a wide range of actors, including researchers, potato farmers, ministry

officials, market information specialists, food technologists, potato transporters and wholesalers, food processors, chefs, and managers of supermarkets and restaurants. The innovation processes triggered by the PMCA continued over several years. Local chain leaders and PMCA champions emerged, but INCOPA continued to broker innovation processes, work with policy makers, engage in public awareness, and strengthen local organizations. There were attempts to establish a multi-sector platform to promote continuing innovation in the potato sector, but this was not successful.

*Outcomes.* The PMCA triggered innovation processes that have had far-reaching consequences for participating farm families and for Peru’s potato sector. Several new fresh and processed potato products were developed. The two most important new products were *Tikapapa* – the first Peruvian brand of high-quality, bagged fresh native potatoes – and *Jalca Chips* -- the first brand of colored native potato chips. The appearance of these two products stimulated other entrepreneurs – both domestic and foreign – to develop other new products, and over time innovation has become a prominent feature of value chains for native potatoes. Scores of “gourmet native potato products” have become available in Peruvian markets and some are exported. INCOPA worked with several local agricultural service providers to meet the technical needs of farmers and processors who wished to capitalize on new market opportunities. Other products included high-quality, freeze-dried, native potato product, called *tunta*, developed through a coalition of farmers’ groups, local government agencies, NGOs and a private service provider in the Altiplano and an instant “Andean mashed potato.”

CIP and Peru’s national potato program identified native varieties that were suitable for processing. More effective pest and disease control measures, and systems for improving the quality of native potato seeds have also been developed. A multi-sector working group that emerged from the PMCA exercise worked to establish Peru’s “National Potato Day,” which has been celebrated annually on May 30 since 2005. The group also worked to include native potato varieties in Peru’s registry of crop varieties, to develop a strategic vision for Peru’s potato sector, and to develop a successful proposal that the Peruvian government submitted to the United Nations to celebrate 2008 as International Year of the Potato (<http://www.fao.org/potato-2008/en/>). Success with the PMCA and the suite of complementary measures implemented by INCOPA led to significant increases in both the supply of and demand for native potatoes in Peru, and benefits for small-scale

producers, processors and other actors along the value chain (Proexpansion, 2011; Horton and Samanamud, 2013; Morris et al., 2017).

## **5.2. Value-chain innovation with potato, sweetpotato and vegetables in Central Uganda (2005--2007)**

*External environment.* Smallholder farmers produce an array of crops for home consumption and cash sale in Central Uganda. Rapid economic growth and urbanization have stimulated commercial agriculture and VCD. Numerous public, private and non-governmental organizations offer agricultural services, but smallholders have often found it difficult to access them.

*Value chains.* Sweetpotatoes are widely grown by smallholder farmers for home consumption, and some are sold along rural roads; very few are processed. Potato are less widely cultivated, mainly as a cash crop. Local traders consolidate supplies for sale in urban areas. A small part of the harvest is processed by small processors who produce snacks for sale in retail shops and around schools. Tomato cultivation is ubiquitous; most tomatoes are consumed fresh, but some are used for processed sauces and ketchup sold in retail shops and supermarkets. Hot pepper was introduced as an export crop, but the domestic market is growing rapidly. While the value chains for potatoes, sweetpotatoes and tomatoes tend to be informal, hot peppers are increasingly farmed under contract for export to Europe.

*PMCA implementation and innovation processes.* Based on early successes with the PMCA in the Andes, the United Kingdom's Natural Resources International (NRI) supported by the Department for International Development (DFID) encouraged Papa Andina to test the approach in Uganda and offered financial support for Phase 1. A significant capacity development effort was developed that involved:

- a study visit for a group of Ugandans to Peru and Bolivia to interact with people who had developed and used the PMCA and to observe the results;
- preparation of the PMCA User Guide;
- action-oriented PMCA training workshops for the local PMCA coordinator and 7 facilitators – all professional women – involving visits to markets and processing facilities;
- systematic knowledge sharing among the facilitators working with different thematic groups;
- backstopping and coaching from Lima-based PMCA specialists; and

- periodic learning-oriented reviews to improve the work, document results, and draw lessons for improving future applications of the PMCA.

A key institutional actor was the Mukono Zonal Agricultural Research and Development Institute (MUZARDI), an affiliate of the Uganda's National Agricultural Research Organization (NARO). Several other public, private, and non-governmental organizations also participated.

In Phase 1, an initial survey of Ugandan R&D organizations was followed by a study visit to Peru and Bolivia for 17 Ugandans, many of who later became PMCA facilitators or supporters based in public, private or non-governmental organizations. The trip was costly but paid off in terms of the esprit de corps and enthusiasm generated and the first-hand knowledge gained on how the PMCA had been used in the Andes.

Three commodity groups were formed to carry out diagnostic studies of the value chains for potatoes, sweetpotatoes and vegetables. Study results were shared among the participating R&D organizations and chain actors at a workshop designed to draw lessons from the process. One issue that needed resolution at the end of Phase 1 was where to obtain resources for Phases 2 and 3. During Phase 2 the commodity groups met approximately each two weeks, to analyze market opportunities. Promising business opportunities were presented to stakeholders and potential supporters at public events. During Phase 3, as innovations took shape, subject matter specialists were brought in to provide advice or perform specialized tasks related to food technology, labeling, packaging, and related subjects. Product shelf life was studied as were consumer tastes and preferences and product acceptability. After seven months, several prototypes for commercial products were presented at the final event at the end of this PMCA application. During the PMCA exercise, not only were there frequent meetings of thematic groups, but the coordinator and the facilitators met frequently to review, coordinate and plan their work. Phase 1 was also reviewed by an external group and the entire exercise was reviewed by an independent evaluator. Results of all these reviews were widely shared with the PMCA team and more broadly with stakeholders of the exercise. In this case, the frequent and intensive interactions of facilitators and participating value-chain actors and service providers contributed substantially to knowledge sharing, skill-building and social capital formation. Actors representing different links in the market chain, gained a better understanding of the other chain actors, their needs, interests and challenges and favoring social learning paving the way for joint problem solving. Many of the relationships developed during this



initial PMCA exercise continued to provide a base for collective action and innovation long after the exercise was completed.

*Outcomes.* Several commercial innovations emerged from the PMCA exercise. Packaging, labeling and branding were improved for potato chips, for two brands of nutritious orange-fleshed sweetpotato flour and for a type of tomato sauce. New products were developed, including sweetpotato chips, an appetizer and a pickle made from hot peppers. A new sweetpotato variety was introduced in a supermarket. Contractual relationships were developed between small potato farmers and urban processors. While some of the original innovations were not commercially viable; others were successfully marketed. Some of the original products are still in the market, while others have been replaced by newer improved versions. Some of the original innovations motivated entrepreneurs to develop entirely new products, such as sliced and dried hot peppers, which are now being exported. Chain actors who have participated in PMCA exercises praise the approach for allowing them to gain knowledge on value chains and to strengthen their networks and alliances in ways that advance their business interests. Interpersonal relationships that were developed among market agents, facilitators, researchers and other service providers have endured.

*“Thanks to the PMCA, we’ve built a platform for R&D where we can get answers to our questions and needs. I always tell my colleagues that when they have a problem, they should tell me, and I know where to go for the solution – to the PMCA fraternity.”*

John Kavuma, President Federation of Associations of Ugandan Exporters

*Building capacity for the PMCA.* A unique feature of this case is the extent to which the facilitators, all women, and other participants have gone on to use the PMCA in other settings. In 2009, the Africa 2000 Network<sup>5</sup> working with some of the original facilitators employed the PMCA in a cassava value chain project in Eastern Uganda. That same year, the Food and Agriculture Organization of the United Nations (FAO) engaged some of these facilitators to provide PMCA training for Farmer Field School facilitators. In 2010, the Participatory Ecological Land Use Management network (PELUM)<sup>6</sup> provided PMCA training for R&D professionals in Uganda, Kenya, Tanzania and Rwanda. In Uganda and Kenya, PELUM members applied the PMCA in the grain

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<sup>5</sup> [www.a2n.org.ug](http://www.a2n.org.ug).

<sup>6</sup> [http://aros.trustafrica.org/index.php/Participatory\\_Ecological\\_Land\\_Use\\_Management\\_\(PELUM\)](http://aros.trustafrica.org/index.php/Participatory_Ecological_Land_Use_Management_(PELUM)).

amaranth and maize commodity chains. The same year, MUZARDI<sup>7</sup> applied the approach in a pineapple project, and in 2011, MUZARDI applied the approach in a horticulture research project in Central Uganda. In 2011 and 2012, MUZARDI led an application of the PMCA in the value chain for indigenous ALV (Case 7). MUZARDI now serves as the hub of a PMCA community of practice and several of the facilitators continue to use the PMCA in their work.

### **5.3. Coffee market development in Peru's San Martín Department (2007-2008)**

*External environment.* Since 2000, political and economic conditions have favored agricultural growth and value-chain development in San Martín Department on the eastern slopes of the Andes. However, public agricultural R&D organizations do not work on coffee, and exporters only support coffee growers who produce for the international market. A few NGOs had worked with smallholder organizations to develop a more inclusive value chain for domestic coffee, with mixed results.

*Value chain.* San Martín produces high-quality coffee that is valued in international markets, but smallholders have difficulty accessing these markets. Market studies have identified coffee as a promising commercial crop for small farmer. But most small producers have limited access to information on modern production methods as well as domestic and export markets. Their limited resources put them at a disadvantage with market agents, who they generally distrust.

*PMCA implementation and innovation processes.* Cases 3 and 4 were implemented within the Andean Change Alliance, which was hosted by CIP and funded by DFID (Thiele et al., 2011b). The purpose of the Alliance was to evaluate participatory R&D methods and use the results to promote their use. Each application of the PMCA was implemented by a local team as an independent case, with limited methodological support from a CIP marketing consultant.

A local technician hired by the international NGO Practical Action coordinated and facilitated the coffee exercise, with backstopping from the marketing consultant (Horton et al., 2013). Another consultant provided some short-term training on techniques for coffee selection, roasting, grinding, and packaging. The main local partner in this case was a women's food processing group. The

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<sup>7</sup> [www.naro.go.ug/Institute/Mukono/home.html](http://www.naro.go.ug/Institute/Mukono/home.html).

exercise was not designed to promote gender equity, but the main direct beneficiaries were the members of this group. In Phase 1, instead of facilitating a participatory diagnosis, Practical Action hired consultants to study the domestic coffee market. Results were presented at a public event with approximately 70 participants, including coffee growers, processors, market agents and public agencies. In Phase 2, an average of eight individuals – mostly members of the women’s processing group – met several times to analyze potential business opportunities. Consultants studied local coffee processing and marketing. In Phase 3, with advice from two visiting coffee experts, members of the women’s group developed a new brand of coffee for the local market. It was launched at the final PMCA meeting attended by 85 participants. Follow-up was limited because Practical Action stopped working with coffee in the area. The public events were well attended, but the small number and lack of diversity of participants engaged in working-group activities limited social learning and social capital formation. Shortly after Practical Action withdrew, both the women’s group and a participating coffee producers’ cooperative ceased operations.

*Outcomes.* The most immediate and visible result of the PMCA exercise was the new brand of coffee the women’s group developed and sold in the city of Tarapoto, in San Martín. Launching the new brand of coffee appears to have stimulated some other entrepreneurs to launch their own brands or improve the quality of their existing brands of coffees. When the women’s group disbanded, three members began processing and marketing their own brands of coffee. The ex-president of the producers’ cooperative has also expanded his coffee cultivation, processing and marketing. In 2018, these four entrepreneurs sold more than 13 tons of processed coffee. It appears that the PMCA exercise has stimulated technical changes in coffee processing equipment and techniques, but no significant technical innovations in cultivation.

#### **5.4. Conservation and marketing of native potatoes on Bolivia’s Altiplano (2007-2009)**

*External environment.* In much of Northern Potosí, on the Bolivian Altiplano, only the hardiest of crops can be cultivated and rural population density is low. Farming generates little cash income, and many young people leave the farm in search of employment in mines and towns. One of the region’s important natural resources is the biodiversity of its cultivated potatoes. Prior to the PMCA exercise, agricultural development and conservation of region’s biodiversity was supported by a Bolivian agricultural research foundation, Promotion and Research of Andean Products (PROINPA)

and a local service organization, the Center for Development Support (CAD). While the national government was supportive of local community development and empowerment, it was skeptical of market-led development initiatives introduced from abroad.

*Value chain.* Native potatoes are usually grown by peasant farmers for home consumption. Northern Potosí produces a very small market surplus of potatoes, which varies from year to year depending on the weather. In good years, farmers sell small amounts of potatoes in local villages or to intermediaries who take them to provincial towns. Only rarely are potatoes shipped to La Paz or other large cities.

*PMCA implementation and innovation processes.* Leadership and facilitation of the implementation process were weak and the FOI was rather low. Group work mainly involved smallholder farmers and the facilitating organization became directly involved in marketing activities. The PMCA exercise was led by CAD, with support from a CIP marketing consultant and backstopping from PROINPA. CAD led product-development and market-testing together with members of a newly established Network of Native Potato Producers (PROPANA). CAD staff members did not have the experience to effectively facilitate multi-stakeholder engagement in innovation processes. The low population density and limited public transportation infrastructure made it difficult for farmers and traders to meet, and there was little interest in improving potato marketing because of the limited market surplus of potatoes.

In Phase 1, CAD and PROINPA conducted an informal survey, identified key value chain actors and visited food stores, supermarkets, hotels and other potential buyers of quality native potatoes. Survey results were presented at a public event with approximately 100 participants including representatives of farmer organizations, indigenous leaders, agricultural support services and potential buyers. It was decided to develop a fresh potato product – selected and washed potatoes sold in small bags and labeled as *Miskipapa*. During Phase 2, seven group meetings were held with an average of seven participants from CAD, PRONAPA, PROINPA and occasionally potato buyers. Work focused on developing statutes for PRONAPA, contacting government offices to obtain political support, developing promotional materials and preparing *Miskipapa* for testing with potential buyers. In Phase 3, CAD and PRONAPA prepared and tested additional batches of *Miskipapa* in local fairs, supermarkets, a hotel and a company store. *Miskipapa* was also formally

presented at a final PMCA event attended by members of PRONAPA, municipal authorities and market outlets in La Paz. While the public events were well attended, thematic working group activities were few and poorly attended, with most participants coming from CAD and PRONAPA. CAD explored options for marketing potatoes, but there was little systematic interaction between farmers and market agents – reflecting, in part, persistent class prejudice against poor, Quechua-speaking farmers. Consequently, social learning and formation of linking social capital was limited.

*Outcomes.* PROPANA found it difficult to acquire potatoes in the quantities and qualities sought by urban retail outlets and lacked an adequate space for storing potatoes and preparing them for sale. CAD stepped in and helped with marketing for a short time, but then lost interest. As a result, Miskipapa disappeared from the market. Discouraged by the limited prospects for agriculture and attracted by employment opportunities in the provincial capital, PROPANA's president left his farm and PRONAPA ceased operations. Shortly afterward, CAD also stopped working in Northern Potosí.

##### **5.5. Innovation in potato value chains in West Java, Indonesia (2008-2009)**

*External environment.* Historically, Indonesia's government has played an outsized role in the economy, but private ownership and markets increasingly dominate economic life. Agricultural policies focus on rice – the main staple food – and secondarily on high-value horticulture and plantation crops. Traditional snack foods, made from cereals and root crops, are integral to Indonesian food culture, and steadily increasing demand is driving snack food processing and marketing. Potatoes and other vegetable crops are important sources of cash income for smallholder farmers in the tropical highlands of West Java. Since its founding, the Indonesian Vegetable Research Institute (IVEGRI) has led vegetable R&D in the area.

*Value chain.* Traditionally used only in European dishes, in recent decades, potatoes have gained popularity in Indonesian foods, including the processed snack foods that are consumed during and between meals. Smallholder farmers have traditionally sold most of their potatoes in local markets, but a growing share of the harvest is now being sold to buyers who supply supermarkets and processors. Unless they are organized, smallholders find it difficult to sell to these new buyers, who look for large volumes of potatoes on a regular schedule and pay farmers 15-30 days after delivery.

Large-scale processing is dominated by Indofood, a subsidiary of Frito-Lay, which has developed a contract farming scheme.

*PMCA implementation and innovation processes.* The PMCA was introduced to stimulate innovation in potato value chains within a project to improve marketing of potatoes and other vegetables in West and Central Java, supported by the Australian Centre for International Agricultural Research (ACIAR). Initially, the consultancy firm SwissContact agreed to lead the PMCA application. But when the project was approved, the firm decided that it could not effectively play this role, and CIP stepped in to provide leadership, via a staff member at CIP's office in Bandung. PMCA developers (Thiele and Bernet) and staff members from CIP's regional office in the Philippines also backstopped the effort.

The PMCA exercise was coordinated by an Indonesian marketing specialist based at the local CIP office. Training, backstopping and mentoring were provided by CIP staff members, including the developers of the PMCA. Consequently, leadership and facilitation were excellent and care was taken to ensure that a diverse stakeholder representatives and service providers were involved in group activities focused on commercial innovation.

Key local partners included IVEGRI, West Java's Department of Agricultural and Food Crops, and the agro-business arm of a large and prestigious NGO, Daarut Taichid. Indonesian facilitators were committed to the goals and principles of the PMCA and organized numerous thematic group activities for product development, testing and promotion. In Phase 1, an informal assessment identified value chain actors, roles and barriers to greater participation of smallholder farmers in market development. Survey results were discussed at a public event attended by around 40 market participants and service providers, who identified potential business opportunities for fresh and processed potato products. During Phase 2, around 25 smallholders, traders, processors, and food shop owners organized two thematic groups to assess business opportunities for fresh and processed potatoes. The public event at the end of Phase 2 attracted about 60 people. During Phase 3, group members developed and tested new products, packaging and labels. The *fresh potato group* arranged for IVEGRI to identify ways to produce more large tubers, which were desired by consumers. The *processed potato group* developed a novel potato chip product and a traditional snack food known as *dodol* using potatoes, instead of cassava. Focus groups were used

to gauge the reactions of consumers to the new products, which were also presented at an agricultural fair and a final PMCA event attended by about 80 stakeholders, local authorities and journalists. During the PMCA, small-scale processors gained useful knowledge on product preparation, labeling, packaging, operation of market chains, and negotiation. But what PMCA participants – both value chain actors and agricultural service providers – valued most was the potential it offered for networking and development of useful contacts and relations among those who participated in the thematic groups and public events. The PMCA promoted development of bridging and linking social capital that allowed people to work across organizational, social and cultural boundaries.

After the PMCA exercise, the project team identified the need for business development services for innovators and for strengthening bonding social capital and the enterprise management and negotiation capacity of farmers' organizations. While project funds lasted, team members continued to meet with innovators and to provide assistance in business development. When project funding ended, so did these follow-up activities. The CIP team developed a "Farmers' Business School" (FBS) approach for strengthening farmers' organizations that was subsequently used in regional projects led by CIP (Prain et al., 2020).<sup>8</sup>

*Outcomes.* By 2011, several smallholder farmers and processors had developed and were selling new products or improved versions of existing products, for example, with new packaging, branding and labeling. Thirteen distinct innovation processes were documented, most of which involved development of such processed products as potato chips and snack foods. Some individuals were involved with several different innovations, and some of the most prolific innovators were women, who had a long tradition of snack food preparation and sale. The innovation processes were highly dynamic, with some processors launching several new products in quick succession. The PMCA contributed to inclusive development by allowing many small producers and processors (especially women) to expand their market involvement and raise their incomes. However, it is important to note that these individuals were not from the poorest strata in

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<sup>8</sup> Readers should note that the FBS referred to here differs from other "Farmer [or Farm] Business School" approaches developed and applied elsewhere (See, e.g., FAO 2011; Chilemba and Ragasa 2019).

their communities. Unfortunately, we have no information on innovation processes and results in this case after 2011.

### **5.6. Market development for organic and typical regional products in Albania (2009-2011)**

*External environment.* Albania is a mountainous country with notable regional and natural diversity. After 50 years of communist rule, in 1992 the new government launched an ambitious economic reform program that included privatization of public enterprises, market development, financial reforms and a land reform that split large enterprises into small farms. The result was a fledgling small-farm economy in an economic dynamic environment.

*Value chains.* Many potentially valuable horticultural, medicinal and aromatic plants are cultivated in Albania, but markets for these products have been underdeveloped. The country has favorable natural conditions for producing organic fruits and vegetables for the European market, especially in springtime, but agriculture has been oriented mainly toward home consumption.

*PMCA implementation and innovation processes.* Starting around 2000, SDC supported development of organic agriculture through a project implemented by the Swiss-based Research Institute of Organic Agriculture (FiBL) and Albanian partner organizations. Initially, this project focused on developing national organic regulation and certification and an extension program within the national organic farmers' association. Significant technical progress was made, but sales of organic products lagged. In 2009 the project shifted its focus to market development and broadened its scope beyond organic products to also include "typical regional products" with less rigorous and costly certification for the domestic market.

Thomas Bernet, who led development of the PMCA at CIP and later moved to FiBL, introduced the PMCA as a guiding framework for this final phase of the Albanian project. An explicit "PMCA Unit" was formed with former project staff, which implemented the PMCA receiving PMCA training and advice from FiBL. The PMCA was implemented with a high degree of fidelity. An initial informal market assessment involved 40 stakeholders. Results were presented at a stakeholder event with around 100 participants, in which thematic groups were established to develop business opportunities for organic exports and typical regional products for the domestic market. Subsequently, the PMCA Unit facilitated a series of thematic group meetings to develop business



ideas that were supported through a small grant scheme. Altogether, more than 200 stakeholders were somehow involved in thematic groups. Based on the expressed demand from stakeholders to develop an umbrella brand for typical Albanian products, FiBL worked with project staff and stakeholders to develop a quality standard and inspection scheme for two regional labels: one relating to typical regional food products from Northern Albania, the other one for agricultural products from Southern Albania. The organic export group focused on ways to upgrade their products and promote them more effectively. These participatory activities contributed substantially to social learning and development of social capital that, in turn, facilitated commercial, technical and institutional innovation.

*Outcomes.* Logos were developed for organic and typical regional products. A rulebook was developed clarifying the regional origin of typical products, minimum quality standards for the product categories, inspection, certification procedures, and conditions to use the logos on product labels. For around 30 products, product labels featuring the two regional logos were developed and printed as part of an improved marketing concept. Different public awareness activities explained the new standards and labels. A specially designed mobile food shop was set in place for exhibiting and selling the new regional products in special events. Plastic tunnels were introduced for early spring planting of organic products. A special pasta-making machine, herb driers, cooling tanks and cold chambers were installed. At the final PMCA event, 47 labeled regional products were presented, along with 7 new products. Most of the regional products already existed prior to the PMCA. Through focus group research, stakeholder discussions and support from technical and marketing specialists, a new set of marketing concepts was developed for “typical regional products.” These were operationalized by improving packaging, labeling and the placement of these products in new markets. Examples of the new products developed include organic olive oil infused with St. John’s wort, fresh watermelons and frozen blueberries for export.

After 2011, when the project ended, the local staff of the PMCA Unit established a consultancy organization – the Albanian Association of Marketing – which became responsible for inspection and certification related to the two Albanian regional labels. This new legal entity has attracted funding from other donors, including Netherlands Development Organization (SNV), World Vision and the United Nations Development Program (UNDP), to support its continuing work with typical

regional products. From 2012 to 2014 the association helped expand the portfolio of regionally labeled products from 47 to 62. The value of sales increased by 30% up to around Euro 542,000. Organic exports medicinal herbs and spices, mushrooms, nuts and olive oil have continued to grow. But organic certification for the domestic market stopped when the Albanian government withdrew subsidies. With their limited purchasing power and less concern for food safety, Albanian consumers are not yet willing to support the full costs of organic certification.

### **5.7. Innovation with indigenous African leafy vegetables in Central Uganda (2011-2013)**

*External environment.* Indigenous African leafy vegetables (ALV) play important roles in the diets of smallholder farmers and peri-urban gardeners in Uganda and elsewhere in sub-Saharan Africa (Meldrum et al., 2018; Sanya et al., 2018). Many women grow them as intercrops in mixtures of vegetables, and use them as ingredients in sauces, supplementing carbohydrate-rich food staples. Despite their high nutritional value, indigenous ALV have generally been ignored in agricultural R&D programs.

*Value chain.* ALV are important in Uganda, but the supply chains are short. Highly perishable ALV are usually consumed on the farms where they are grown. Few ALV are found in urban markets, and those available are often of poor quality. Packaging, labeling and processing of ALV is virtually unknown.

*PMCA implementation and innovation processes.* In 2007, supported by a grant from USAID, Uganda's Rural Agency for Sustainable Development (RASD) began a collaborative project with the University of California at Davis to promote the production and marketing of ALV. Little progress was made in marketing until 2011, when MUZARDI was invited to apply the PMCA. Given MUZARDI's extensive previous experience with the PMCA (Case 2, above), it was able provide strong leadership and facilitation for this exercise, which was implemented with high fidelity. Further, the exercise was conducted as a systematic action research project, reported on by Sanya (2018).

Phases 1, 2 and 3 of this PMCA exercise involved 121, 70 and 103 stakeholders, respectively. A diagnostic study of ALV production and marketing included interviews with around 100 farmers, 13 traders, a transporter, a processor and a researcher. Results were presented at a public event

attended by most of those surveyed. Thematic groups were established to work on issues of: (a) seed production, processing and marketing; (b) production and marketing of fresh leafy vegetables; and (c) processing. During Phase 2, the groups met fortnightly to analyze potential market opportunities, share experiences, and develop business plans for selected enterprises. Participants included 17 farmers, 11 traders, 11 researchers, nine extension agents, two processors, three seed companies and one transporter. In Phase 3, thematic groups developed new products. A food science laboratory at Makerere University helped with testing and market trials. Results of this phase were presented to government officials, the media and various other stakeholders at the PMCA final event. Participatory activities in the thematic groups strengthened social capital, but the absence of research capacity on ALV and the underdevelopment of commercial value chains for ALV limited the scope of social learning among diverse value chain actors and service providers.

*Outcomes.* A key outcome of the PMCA was the establishment of a community-based ALV seed group. Experiences shared by members complimented the knowledge farmers gained from Farmer Field Schools run by RASD. The group established links with two private seed companies that now market ALV seeds. Individual farmers – mostly women – also began to sell ALV seeds independently. In one year, the seed group collectively marketed 1,240 kg of ALV seeds (not including the amount of seed marketed by individual farmers, which is unknown). The average price at which the group sells a commonly grown ALV (*Nakati*—*Ethiopian nightshade*) increased from 20,000 Ugandan shillings per kg in 2015 to 35,000 shillings in 2018. Prototypes for three processed products were also developed: a nutritious powder made from *nakati*; an enriched peanut butter, incorporating *nakati* powder; and a variant on a common snack food (*baghia*) that incorporates the powder. Nutritional analysis indicates that these products could help reduce childhood malnutrition. However, the products were not successfully marketed. Children and their mothers reacted negatively to the green color of the new *baghia* product. The enriched peanut butter could not be sold without certification by Uganda’s Bureau of Standards, which was not obtained before the PMCA exercise ended. Follow-up activities involved a research project on business development and certification of quality-declared ALV seeds, which has encouraged more women to engage in the seed business. Systematic information is not available on changes in the production and use of ALV after the PMCA exercise, but it appears that ALV cultivation has expanded and ALV are appearing more frequently in urban markets. The PMCA helped change the

perception of ALVs as a food for the rural poor, and it contributed to the knowledge and skills of market chain actors and others involved in the process. Through application of the PMCA, new research areas related to cultivar selection, foundation seed production, postharvest management, and business development support services emerged and triggered formulation of new research projects.

#### **5.8. Stimulating innovation in aquaculture value chains in Bangladesh and Nepal (2011 to 2014)**

*External environment.* About 80% of Bangladesh is in a delta plain, and aquaculture has long been part of rural peoples' livelihoods. Fisheries generate about 20% of agricultural GDP. The sector is growing fast, driven by expanding domestic markets. Per capita fish consumption is now about 20 kg per year, and fish accounts for 60% of the animal protein intake nationally. In contrast, Nepal is a mountainous country where aquaculture is in its infancy, mainly limited to the subtropical Terai plain. Nepalese fisheries contribute less than 3% of agricultural GDP, and annual per capita fish consumption is only around 2 kg.

*Value chain.* In recent decades, Bangladesh's aquaculture has intensified rapidly, and a range of new value chain actors have appeared, including feed millers, hatchery and nursery operators, equipment and fish medicine suppliers, and fish transporters, wholesalers and retailers. Nepal's aquaculture has recently begun to grow quickly, to meet the growing demand for animal protein, and value chains are developing along the lines of those already established in Bangladesh.

*PMCA implementation and innovation processes.* The EU-funded "Agriculture and Nutritional Extension Project" (ANEP) aimed to improve food security and nutrition of the poorest and most vulnerable households in Nepal and Bangladesh. When the project was formulated, the international NGO iDE introduced the PMCA as an organizing framework.<sup>9</sup> According to Jahan et al. (2018: 396) "all project activities were based on principles of the PMCA." ANEP's aquaculture component was implemented by a consortium of research and development organizations led by World Fish. This work and its results have been amply documented in project reports and publications cited in Annex Table 1.

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<sup>9</sup> iDE had learned about the PMCA from DFID's Research into Use Program, which supported an application of the PMCA with vegetables in Nepal.

In this case, thematic groups focused mainly on improving communication and relations among actors within the input supply chain for fish farming, rather than the value chain for fish destined for the consumption market. For this reason, most of the group participants were fish farmers, hatchery and nursery owners, and suppliers of feed, fertilizer and aqua-medicines. Fish harvesters and traders were also involved, but in smaller numbers.

About 1,900 resource-poor households in Bangladesh and 600 in Nepal participated in the PMCA exercise. Roughly 40% of the participants were women. During Phase 1, diagnostic research and market surveys were conducted to identify key actors in the fish value chains and understand their interests, problems, and ideas. Nine thematic groups, including fish farmers, hatchery and nursery owners, suppliers of feed, fertilizer and aqua-medicines, and food fish traders, were established in Bangladesh and three were established in Nepal. The groups, facilitated by external service providers, provided a forum for participants to share information and interests and gain an understanding of the whole value chain. The main aim of Phase 2 was “to develop trust among market chain actors and promote shared learning about improved technologies” (Jahan et al., 2018: 397). During Phase 3, fish farmers met with local extension agency staff and participated in national agricultural fairs and symposia. Evaluation studies indicate that the interactions that took place in the thematic groups and associated activities contributed to social learning and formation of bonding, bridging and linking social capital. Results of an in-depth assessment indicate that from 2012 to 2014 an important result of the PMCA was that “fish thematic group participants’ working modalities evolved from an individualistic approach to a more group centered one” (Jahan et al., 2018: 402).

*Outcomes.* This application of the PMCA was very successful in strengthening relations among value-chain actors and improvements in aquaculture techniques. According to Jahan et al. (2018: 395),

*“... in both countries the PMCA intervention significantly increased the quantity of fish produced, consumed and sold by participating households, leading to an approximate doubling of yields and income from fish.... PMCA fostered better access to markets for inputs and end products among market chain actors of all types, and improved their coordination and collective decision making, thereby somewhat rebalancing the dynamics of trade relationships to empower small producers.”*

Thematic groups improved communication, knowledge sharing and levels of trust among hatchery owners, nurseries, farmers and extension agents, facilitating improvements in production practices. Better networking among value-chain actors improved the local availability of aquaculture inputs and services. One key innovation involved replacing Indian carp with small indigenous fish species, which required the collaboration of fish hatcheries, nurseries and smallholder farmers who manage their own fishponds. Successful innovation led to increases in fish production, home consumption and sales. As a result of discussions during thematic group meetings and study visits, nursery owners began increasing the size of the fingerlings they sold to farmers and more shopkeepers began to sell fish medicine. According to Nepali hatchery owners, community exposure gained in thematic group meetings helped them improve relations with both suppliers and customers. Nepali farmers who participated in group study visits to Bangladesh reported learning new ways to improve fish feeding and pond management, which they shared with their neighbors back home. Quantitative and qualitative analysis of this case indicates that “the PMCA facilitated smallholder inclusion in markets, by simultaneously enhancing their capacity to engage in farm production and improving their bargaining position in trade relationships” (Jahan et al., 2018: 404). Participation of women in marketing has increased in both countries, but less so in Bangladesh where religious norms (e.g., *purdah*) restrict the movement of some women outside the home to a greater extent than in Nepal.

## 6. Discussion

In this section, we discuss patterns across the cases, in relation to the main components of our analytical framework (see again Figures 3 and 4). Findings are summarized in Figure 5, which presents scores for:

- key attributes of the external environment, the value chain and the intervention;
- the innovation processes that took place in each case; and
- the commercial, technical and institutional innovations that resulted.

As can be seen in Figure 5, more substantial commercial, technical and institutional innovation was observed in Cases 1, 2, 6 and 8 than in cases 5 and 7, and little innovation was observed in Cases 3 and 4. The cases with the most innovation tend to be those with the most favorable policy environment and those where the PMCA benefitted from the strongest leadership, the highest fidelity of implementation, the best facilitation and the most intensive innovation processes. In the

remainder of this section, we discuss the main drivers of innovation and the innovation outcomes observed.

**Figure 5.** Scores for drivers of innovation; innovation processes; and outcomes in eight cases.

FACTOR SCORED	CASES							
	1 Nat. potato Peru	2 Various Uganda	3 Coffee Peru	4 Nat. potato Bolivia	5 Potato Indonesia	6 Reg. prods. Albania	7 ALV Uganda	8 Aquaculture Nepal, Bangla.
<b>A. DRIVERS OF INNOVATION</b>								
<b>Attributes of the external environment</b>								
Agroecology & livelihood systems	1.5	1.5	1.0	0.0	2.0	2.0	1.0	2.0
Policies & market conditions	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0
History, culture & instnl. support	1.5	1.5	1.0	1.0	2.0	1.0	0.5	1.0
<b>Attributes of the value chain</b>								
Commodity & its marketing	1.0	2.0	1.0	0.5	2.0	1.0	0.5	2.0
Potential for value addn./cost redn.	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0
<b>Attributes of the intervention</b>								
Fidelity of implementation	2.0	2.0	1.0	0.0	2.0	2.0	2.0	1.0
Leadership & institutional support	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0
Facilitation	2.0	2.0	1.0	0.0	2.0	2.0	2.0	2.0
Complement. intervts. & follow-up	2.0	1.0	0.0	0.0	1.0	2.0	1.5	1.5
<b>B. INNOVATION PROCESSES</b>	2.0	2.0	1.0	0.0	2.0	2.0	1.5	2.0
<b>C. OUTCOMES</b>								
Commercial innovations	2.0	2.0	1.5	0.5	2.0	2.0	1.0	1.0
Technical innovations	2.0	2.0	0.5	0.0	1.5	2.0	1.5	2.0
Institutional innovations	2.0	1.0	0.0	0.0	1.0	2.0	1.5	2.0

Source: Authors

Scale:

0 - 0.5	a negative or small influence, process or outcome.
1.0 - 1.5	a moderate positive influence, process or outcome.
2.0	a large positive influence, process or outcome.

### 6.1. Drivers of innovation

This section summarizes our findings related to the different drivers of innovation, related to the external environment, the value chain, the intervention and innovation processes.

#### *Attributes of the external environment*

*Policy environment.* In the cases studied, public policies and strategies generally favored VCD. The exception was Bolivia, where the government promoted rural and community development, but

frowned on market-oriented development projects that benefitted traders and other businesspeople.

*Agro-economy.* Innovation processes were generally more dynamic and the outcomes were more significant where agro-economic conditions were more favorable and farming was more market-oriented. For example, in Indonesia, where potato farming was highly commercial and there was a long tradition of artisanal food processing and marketing, small farmers and processors were eager to work together to develop new potato-based products that met growing urban demands. In contrast, on the Bolivian Altiplano, where rural population density was low, few crops were grown, frequent droughts and frosts caused extreme fluctuations in crop yields, and rural households cultivated potatoes mainly for home consumption, farmers and market agents had few incentives to participate in the PMCA exercise. These observations concerning agroecology and livelihood systems are consistent with the findings of previous research that indicate that smallholders require a minimum threshold of resources and market access to benefit significantly from VCD interventions (Donovan and Poole, 2014; Stoian et al., 2016).

*Institutional support for agriculture.* Agricultural R&D organizations can play valuable roles in stimulating innovation, but prior to the PMCA exercises, in most of the cases they had played only limited roles. One reason is that agricultural research organizations seldom work on issues of marketing, processing or food technology. They have resisted proposals to work with NGOs, market agents and food processors, and have frequently lacked the knowledge and tools to work with these important stakeholder groups. This is one reason why mainstream agricultural science and research programs are “locked into” traditional technology regimes and approaches centered on plant breeding and associated yield-increasing research, hindering the use of more holistic, participatory approaches, such as the PMCA (Vanloqueren and Baret, 2009). For example, Peru and Bolivia have long traditions of potato R&D that has focused on disseminating new, high-yielding varieties, rather than improving the use of native potatoes (the focus of Cases 1 and 4). Peru’s small coffee producers (Case 3) got no support from the country’s public agricultural research organizations, which did not work on the coffee crop. In Albania, prior to the SASA project (Case 6) there was no institutional support for organic or regional agricultural products. In Uganda, NARO did not conduct research on indigenous African leafy vegetables (Case 7). As a result of their



involvement in PMCA exercises, several agricultural research organizations began to play more active roles in value-chain innovation processes that benefit small producers.

### ***Attributes of the value chain***

*Subsistence- vs. commercially oriented chains.* The PMCA has generally been more effective in stimulating innovation within existing commercial value chains than in developing new chains for subsistence crops. The main exceptions relate to native potatoes in Peru and orange-fleshed sweetpotatoes in Uganda, which were transitioning from subsistence to commercial crops when the PMCA exercises took place. In both these cases, the crop varieties promoted were more nutritious than commonly used ones, capitalizing on opportunities to create niche markets for healthy foods. Indigenous African leafy vegetables may now also be transitioning from subsistence to commercial crops in Uganda. In all these cases, the PMCA appears to have accelerated commercialization processes.

*Changing perceptions and potentials.* The case of native potatoes in Peru shows how quickly perceptions and market potentials can change for previously neglected crops. Traditionally, native potatoes were viewed as a food for poor highland people. But during the last two decades, economic growth, urbanization and growing interest in healthy foods, coupled with a campaign to link national identity to local resources and traditions, led to a revaluation of native potatoes and a rapid increase in market demand for them. Native potatoes are now viewed as a central ingredient in gourmet Peruvian cuisine and a source of national pride. These changes in perception, stimulated by the PMCA and complementary activities of INCOPA, led to what has been referred to as a revolution in Peruvian potato production (Scott, 2011; Horton and Samanamud, 2013; Morris et al., 2017).

*Value addition.* The PMCA has generally been most effective when used to stimulate innovation in chains for high-value, processed foods and niche markets, such as native potato products, orange-fleshed sweetpotato flour, coffee, and organic and regional products. In these cases, novel products were developed that were appropriately packaged and labeled to meet local consumer requirements.

***Attributes of the intervention***

*Role of PMCA within the larger intervention.* The PMCA has been most effective when it has been implemented as an integral part of a broader intervention that also included applied research, strengthening of farmer organizations, business promotion, public awareness and support. In one case (aquaculture in Bangladesh and Nepal), the PMCA was used to guide the entire program. In another case (native potatoes in Peru), it was used early in the program to engage a wide range of stakeholders, setting the foundation for later complementary activities. In three other cases (organic agriculture in Albania and sweetpotatoes and ALV in Uganda), the PMCA was introduced into mature technically oriented programs to cope with marketing issues, benefiting from previous project work and existing networks. The PMCA has produced fewer benefits where it was implemented as a stand-alone project, as with coffee in Peru and native potatoes in Bolivia.

*Fidelity of implementation.* The cases that led to the most successful innovations were generally implemented in accordance with the PMCA's basic principles. Engagement of diverse stakeholders (including farmers, entrepreneurs along the value chain and service providers), which is crucial to the success of the PMCA, has often proven difficult to achieve. In the least successful cases (Cases 3 and 4), only one or a few stakeholder groups were committed to and engaged in the exercise. Here, and in other cases that are less well documented, it appears that facilitators gravitated toward working with the individuals and organizations with whom they were most familiar, limiting the diversity and innovative capacity of thematic groups.<sup>10</sup> In some cases, it was difficult to identify promising business opportunities, discouraging the involvement of private companies.

While successful project teams respected the basic principles of the PMCA, they needed to skillfully tailor implementation procedures to fit local needs and resources. The PMCA User Guide calls for a three-phase process with training workshops at the beginning of each phase, group work during the phase and a large public event at the end of the phase. This sequence is generally expected to take between six months and a year. However, in the original Ugandan case, where new funding had to be obtained for each phase, the entire exercise took more than two years to complete. In Albania, on the other hand, where participants had already acquired substantial knowledge of the target value chains and key stakeholders, it was possible to skip most of the Phase 1 activities. In

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<sup>10</sup> See for example the cases led by Bioversity and the World Agroforestry Centre in Annex 1.

the Peruvian coffee case, since there was only one facilitator, in-service training was provided instead of the usual formal training workshops. And whereas PMCA exercises have usually focused on innovation in the value chains for consumer products, in Bangladesh and Nepal, the exercise focused instead on improving the supply chain of aquaculture inputs used by smallholder fish farmers. The novelty of the approach and the need to tailor implementation procedures to fit local circumstances, place a premium on the quality of local leadership and facilitation. This is certainly one reason why most of the successful cases have benefited from the direct involvement or mentoring of developers of the approach. The aquaculture case is one of the two of eight cases that was implemented with no direct support from the Papa Andina team involved in the original development of PMCA.

*Leadership and institutional support for the exercise.* As Klerkx and Arts (2013) point out, different kinds of “champion” can play important roles in innovation processes. The more successful cases in our study generally counted on an individual in a high-level recognized organization who supported the intervention, stable leadership for the exercise itself and the emergence of one or more champions within the value chain who took personal responsibility for innovation and encouraged others to do so as well.

In the original case in Peru, CIP and INCOPA provided leadership and mobilized potential leaders in the public and private sectors and the NGO community. It is likely that having a prestigious center like CIP take the lead in promoting native potatoes encouraged national organizations to become involved and helped change consumer attitudes toward native potatoes.

The involvement of supermarket executives in the PMCA exercise was crucial for scaling up the marketing of native potato products in Peru. Members of the highly respected Wong family, which owned Peru’s premier supermarket chain, offered to test the market potential of Tikapapa in their supermarkets. Based on its early success they championed the development and marketing of other fresh and processed native potato products.

Initially, only one small food processor was willing to experiment with development and marketing of a native potato chip. But as soon as the sale of Jalca Chips demonstrated the market potential of

this type of product, several other, larger and more sophisticated food processors began to develop and market similar products.

In promoting and supporting the PMCA, Papa Andina played the role of an innovation broker, developing and using participatory approaches, facilitating teamwork and group decision-making, engaging new types of partners outside the usual circle of research organizations, and providing a forum or “safe space” where members from participating national organizations could come together to discuss problems and explore possible solutions (Devaux et al., 2010).

In Uganda (Case 2), CIP introduced and backstopped the PMCA exercise, and key individuals in NARO-MUZARDI and the Ministry of Agriculture served as local champions. Seven professional women from different organizations coordinated and facilitated the PMCA exercise, and entrepreneurs led the development of new or improved products in each of the value chains. Later, NARO-MUZARDI led a PMCA exercise with African leafy vegetables (Case 7). MUZARDI’s Director, who had been active in Case 2, mobilized support for the PMCA within her organization and backstopped the coordinator. A local women’s group led the development of a seed system for African leafy vegetables.

*Critical role of facilitation.* Effective facilitation is crucial for the PMCA because stakeholders from different backgrounds and with divergent or conflicting stakes in the value chain need to communicate effectively, build up interpersonal trust and work together. Learning to facilitate complex multi-stakeholder processes can benefit from interaction with experienced practitioners and the sharing of tacit knowledge. For this reason, it is not surprising that the developers of the PMCA provided facilitation training and mentoring in the four best-facilitated cases.

Facilitation was weak in the less successful cases. For example, in the Bolivian case coordinated by members of a service organizations with financial problems, facilitators deviated from their intended roles and became directly involved in marketing activities.

Many facilitators report that developing capacities for negotiation, communication, conflict resolution and related facilitation skills has proven useful in their other professional work. For example,

*PMCA was my initial experience facilitating multi-stakeholder processes, and it helped me deal with many people from different institutions at the same time. In my role [as MUZARDI Director] I have always kept PMCA in the background of the R&D activities we conduct.... I encourage (plant) breeders to have the market in mind and engage actors along the commodity chain in their research work. (Uganda)*

*Contributions of research organizations.* Where research organizations were engaged – CIP in Peru, Uganda and Indonesia; NARO-MUZARDI in Uganda; FiBL in Albania; and World Fish in Nepal and Bangladesh – they often made significant contributions to innovation processes. In Peru, CIP scientists suggested the development of potato chips from multi-colored native potatoes, and they identified varieties that were appropriate for processing. In Uganda, CIP and NARO conducted research on orange-fleshed sweetpotatoes that supported VCD. In Nepal and Bangladesh, World Fish provided extensive technical support for aquaculture development. In all these cases, the PMCA helped link research to VCD.

*Funding and continuity.* Dependence on short-term donor project funding has often constrained PMCA exercises – which require a minimum of several months and can take years. The lack of follow-up after completion of the PMCA exercise can also limit the impact of the PMCA as well as the evaluation of impacts. In all the cases, funding for the PMCA was provided by international donors. In all but one (the original Peruvian case) funding was provided through projects with short time horizons –three years or less. The significant results achieved with potatoes in Peru illustrate the outcomes that can be achieved when the PMCA and complementary interventions are implemented with long-term support. This observation is consistent with findings of previous research that transformational changes in value chains often requires support over a decade or more (Devaux et al., 2018: 113).

## **6.2. Innovation processes**

In general, the cases that generated the most innovation were those which involved the largest and most diverse sets of value chain actors and service providers in thematic group meetings and which gained the support of key individuals in the public and private sectors. In many cases, thematic working groups offered farmers, traders, processors, researchers, and other service providers involved in a value chain their first opportunity to exchange views, discuss challenges and explore opportunities that could yield mutual benefits.

Participants in PMCA exercises have derived many benefits from information exchanges, networking and development of new working relations. In Indonesia, participants have stated that the feature of the PMCA they valued most was the potential it offered for networking during thematic group meetings and large public events. In this way, the PMCA contributed to the development of bridging and linking social capital that allowed people to work across organizational and cultural boundaries. Specifically, it allowed smallholder farmers to interact and work more effectively with processors, wholesalers, researchers and other service providers.

In Uganda, participants in the first PMCA exercise have stated that it brought them useful new contacts that in some cases led to new business deals. New collaborations were also reported among different R&D organizations that had not worked together before. The Ugandan facilitators who participated in the initial PMCA exercise – all women –formed an informal community of practice that has continued to function for more than a decade. The members are always on the lookout for opportunities to use the PMCA and they have led numerous applications in different value chains, in the context of research-for-development projects in Uganda and neighboring countries. NARO-MUZARDI, which serves as the hub for this group, has applied the PMCA in value chains for sweetpotatoes, pineapples, indigenous African leafy vegetables and other crops.

In Peru, the involvement of officials from the Ministry of Agriculture was crucial for gaining their support, which enhanced the legitimacy of the PMCA exercise and motivated the Ministry to launch an information campaign on the cultural and nutritional values of native potatoes. Involvement of managers from the Wong supermarket in the PMCA exercise was also crucial for introducing new potato products into Peru's leading supermarket chain. Participants in the PMCA exercise went on to establish a working group that successfully lobbied for the establishment of the country's National Potato Day and for the UN to declare 2008 as the International Year of the Potato. These activities have contributed immeasurably to the image of the native potato as a national treasure, boosting consumer demand, and stimulating innovation in the value chain. Relations established between farmers' organizations, NGOs and public institutions have also endured, improving the provision of technical assistance and other services to smallholder farmers.

In several cases, participants have noted the importance of face-to-face exchanges and of study visits within their countries or abroad. The study visits organized for Ugandans to visit Peru and Bolivia and for Nepalese fish farmers and input suppliers to visit Bangladesh played especially valuable roles in “opening the eyes” of participants to new possibilities and stimulating them to make changes in their operations back home.

### **6.3. Outcomes**

The main expected outcomes of a PMCA exercise are commercial innovations, which are important in their own right and because they are expected to trigger technological and institutional innovations as well as further rounds of commercial innovation. A less tangible, but potentially important outcome is formation of social capital that can facilitate future innovation processes and outcomes.

#### ***Commercial innovations***

New or improved products – at least prototypes – were developed in all the cases analyzed, but not all of them were successfully marketed. The most significant commercial innovations emerged in four cases:

- Numerous high-quality native potato products in Peru (Case 1)
- A nutritious sweetpotato flour, tomato and hot-pepper sauces and pastes and improved packaging and labeling for a high-quality potato chip in Uganda (Case 2)
- New potato-based snack foods prepared and marketed by small businesses in Indonesia (Case 5)
- Certified typical regional products in Albania (Case 6)

In the most innovative cases, stakeholder groups identified market opportunities and developed products that satisfied consumer demands, paying particular attention to product differentiation, labeling, packaging and quality assurance. The most visible and attention-getting commercial innovations involved processed products, such as potato chips, sweet-potato flour and hot-pepper paste. Nevertheless, there have been some innovations with fresh produce, including such things as improved selection, cleaning, grading and attractive packaging, that have generated significant benefits for producers and consumers. Encouraged by the example of *Tikapapa*, for example, Peruvian supermarkets have improved the quality, presentation and marketing of fresh potatoes

across the board. They now highlight the valuable culinary and dietary attributes of native potatoes and promote their consumption.

Early innovations often triggered further innovation processes that were dynamic, unpredictable and tended to snowball. The first products that entered the market were often soon replaced by others that were less costly or of higher quality. In Peru, all the original potato products disappeared within a few years. *Jalca Chips* were replaced by other brands that were more appealing, more attractively packaged and had a longer shelf life. Supermarkets replaced *Tikapapa* with other new brands of fresh native potatoes that were more appealing to consumers (Figure 6). In Uganda, where early innovations with potatoes and sweetpotatoes focused on packaging and labeling, *TomCris* potato chips and *SOSPPA* composite sweetpotato flour are still in the market today, with the same appearance and labels, but less costly packaging. Motivated by success with the original tomato and hot pepper products, Ugandan processors also developed new products with other commodities.

### **Technical innovations**

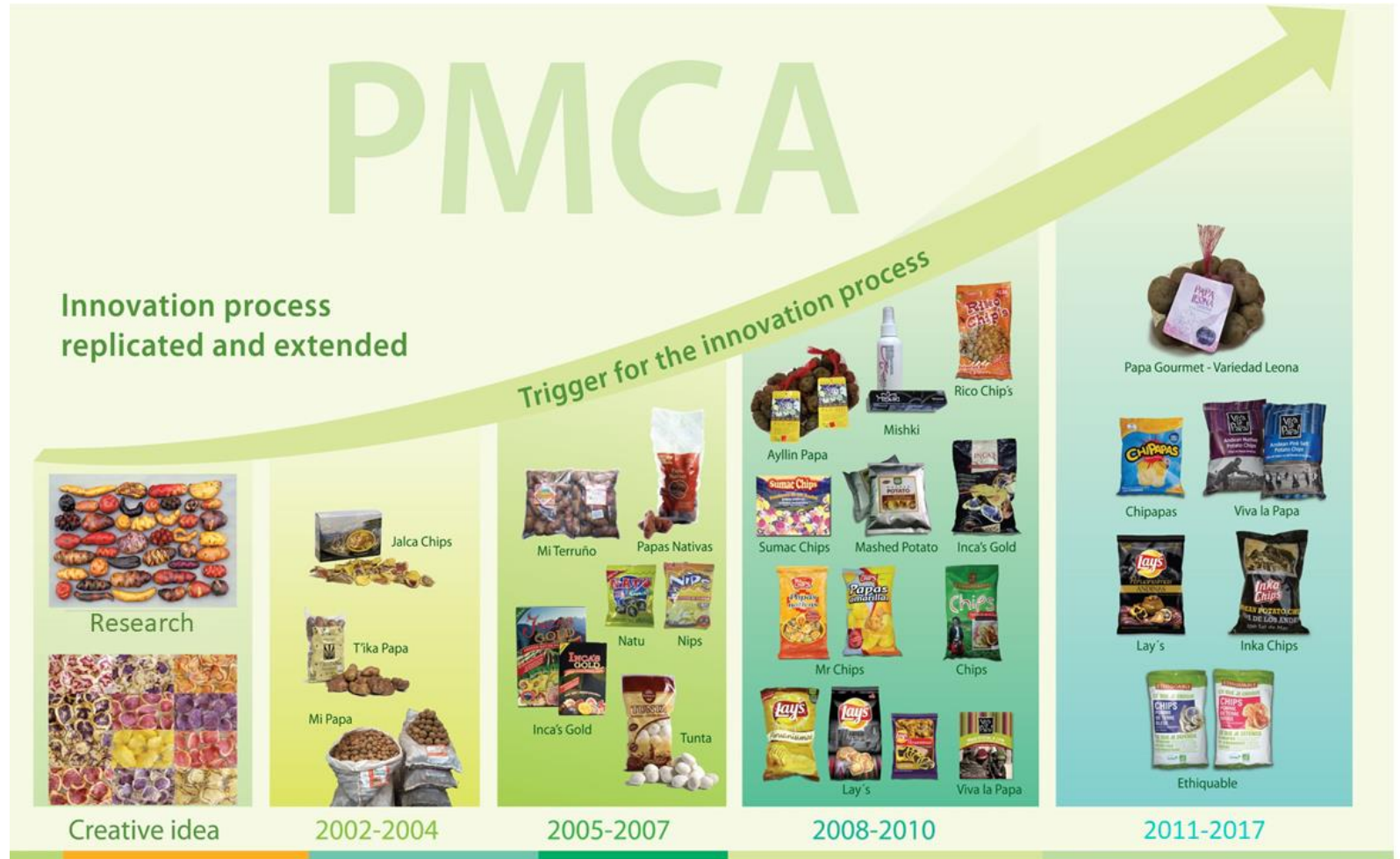
Most studies of PMCA exercises have reported more systematically on commercial than technical innovations because these studies were designed to assess whether or not the PMCA had resulted in viable new or improved products. The studies generally did not include fieldwork to capture information on technical changes in cultivation, post-harvest practices, marketing or processing. The most detailed information available on technical innovation is for native potatoes in Peru, where we know that researchers identified and selected native varieties that were suitable for processing, these varieties were included in the official catalogue of potato varieties, and small farmers now grow them as a commercial crop. Farmers have also improved their planting material, fertilization, pest management, and the selection and grading of harvested potatoes. Appropriate packaging has been developed for both fresh and processed products. Improvements have also been made in the seed systems for native potatoes (Ordinola et al., 2013a). In Indonesia, development of new potato-based snack foods involved technical improvements in potato selection, peeling, preparation and packaging. In this case, information is not available on changes in cultivation methods. In Albania, growing sales of certified regional products stimulated technical improvements in the cultivation and processing of regional products, and plastic tunnels were introduced to lengthen the growing season for organic vegetables. In Uganda, early experiences



with sales of sweetpotato flour indicated the need to increase its shelf life, stimulating applied research on this topic. More recently, initiation of commercial seed production for ALV represents significant technical and institutional innovation, with direct benefits for the Ugandan women who produce and sell the seed and also those who use it to grow ALV for consumption and sale. In Peru, the marketing of new brands of coffee went hand in hand with improvements in the coffee processing techniques used by members of the women's processing group, and later by the individual members who now produce their own brands of coffee.

The most extensive technical innovation has been reported in the aquaculture case in Bangladesh and Nepal, where thematic working groups strengthened relations between input suppliers and fish farmers. This has led to important changes in the species of fish raised, in the sources and quality of hatchlings and fingerlings available, in the supplies of feed and aqua-medicines, and in the overall management of hatcheries, nurseries and fish farms.

Figure 6. New product development triggered by the PMCA in Peru.



Source: Devaux et al., 2020 (Figure 3).

***Institutional innovations***

Commercial innovation has stimulated changes in arrangements in both input and product markets. In Peru, as supermarkets and industrial food processors began to purchase native potatoes, vertically integrated value chains emerged. In Uganda, contract farming for hot peppers for export flourished, and potato processors established long-term relations with leading farmers who also buy fresh potatoes from their neighbors to supply to the processors. As noted above, initiation of commercial seed production by a Ugandan women's group represents an important institutional innovation in the value chain for ALV. As Indonesian farmers expanded potato sales to supermarkets and processors, some groups began to coordinate the timing and volumes of production and deliveries; contract farming also spread. In Albania, a rather simple certification scheme was developed for "typical regional products," and labels were developed that identify each product's origin and ensure its quality. The Albanian Association of Marketing was established and assumed responsibility for certification of the "typical" products sold in Albania; it also provided a range of business development services for entrepreneurs working with typical and organic products. In Bangladesh and Nepal, where the PMCA brought fish farmers into contact with input suppliers and service providers, the strengthened interpersonal relations have facilitated improvements in both production and marketing.

At the end of several PMCA exercises there have been attempts to transform thematic working groups into sustainable innovation platforms. These efforts have generally not been successful. However, the social capital built up during PMCA exercises has sometimes been maintained in other ways. In Bolivia, Ecuador, and Peru, for example, multi-stakeholder platforms were established to support innovation processes (Thiele et al., 2011a). In Peru, the original platform (CAPAC) evolved into a multi-sector commission that promoted the establishment of the country's National Potato Day, which has been celebrated annually since 2003. This event has played a crucial role in improving the image of native potatoes and changing consumers' perceptions of them, from a poor person's food to a national treasure. These changes, in turn, have stimulated consumption of native potatoes. In Ecuador, the original platform evolved into a farmers' organization called CONPAPA that works to improve the ability of smallholder farmers to participation on favorable terms in the development of potato value chains (Devaux et al., 2020).

#### 6.4. Scaling issues

Scaling – the extent to which new practices are used in a sustained manner on a large enough scale to generate meaningful benefits – is an increasingly important topic in discussions of agricultural innovation. Two aspects of scaling are relevant for our analysis of the PMCA: (a) scaling of the commercial, technical and institutional innovations that emerged from PMCA exercises; and (b) scaling of approach itself. In both cases it is relevant to distinguish outscaling as the spreading of an innovation in the same sphere (for example in the geographical area where the project functioned) from *upscaling*, which creates conducive conditions and policies for scaling at higher levels, such as the broader region, the country as a whole or even beyond (Hermans et al., 2013). Both are interdependent, since upscaling can create an enabling environment for further outscaling beyond the sphere in which the new innovation was developed.

##### ***Scaling of commercial, technical and institutional innovations***

The impacts and scaling of innovations emerging from the PMCA have been studied only in Peru (Case 1) and Nepal and Bangladesh (Case 8). The Peruvian native potato case benefitted from a favorable external environment with supportive economic policies, rapid growth in the economy and the food processing sector. The PMCA benefitted from the revaluation of indigenous foods in Peru’s culture and cuisine, and also contributed to this process. Both the PMCA’s developers and high-level representatives of the Ministry of Agriculture were involved in this case, in which the approach was used within a comprehensive sector-development program (INCOPA). Stable funding over more than a decade and strong participation from the Ministry of Agriculture triggering upscaling. This confluence of factors led to significant changes at the national level in the perception and uses of native potatoes, stimulating economy-wide increases in both supply and demand. Consequently, the innovations that emerged from the PMCA triggered further rounds of innovation that produced significant benefits (Proexpansion 2011; Horton and Samanamud 2013; Morris et al., 2017). It is likely that the innovation processes triggered by the PMCA and upscaling expanded production and marketing, and higher prices for native potatoes have benefitted more than 100,000 of Peru’s farmers and market agents.

An impact study for the aquaculture component of the Agriculture and Nutrition Extension Project in Nepal and Bangladesh (Case 8) indicates that around 2,500 resource-poor households participated directly in project activities. According to Jahan et al. (2018: 395), “in both countries

the PMCA intervention significantly increased the quantity of fish produced, consumed and sold by participating households, leading to an approximate doubling of yields and income from fish.” Additionally, “PMCA fostered better access to markets for inputs and end products among market chain actors of all types, and improved their coordination and collective decision making, thereby somewhat rebalancing the dynamics of trade relationships to empower small producers” (*ibid.*) It is important to note that the information on benefits of the aquaculture work was gathered at the end of the project. While there were significant numbers of beneficiaries by this time, it is not clear if the early innovation processes persisted beyond the project timeframe. In light of the significant progress made in social capital formation and innovation during project implementation, it is likely that innovation processes continued after project completion, but the scaling of benefits has not been assessed for this case.

Looking across the cases, the scale of innovation and the benefits for producers, market agents and consumers have clearly been much larger in the Peruvian native potato case than elsewhere. In Case 1, it is likely that more than 100,000 small farmers and market agents have benefitted from the PMCA. In Nepal and Bangladesh (Case 8) around 2,500 resource-poor farm families had benefitted from the PMCA by the time the project ended. In Uganda and Albania (Cases 2 and 6), anecdotal information indicates that upwards of 1,000 low-income households have benefitted from the PMCA. In the remaining cases (Cases 3-6) it appears that fewer than 1,000 families benefitted.

### ***Scaling and mainstreaming use of the PMCA***

In the eight cases studied here and in all the other known applications, the PMCA was used in the context of donor-funded R&D projects. When these projects ended, the approach was generally not incorporated into the standard operating procedures of the participating organizations. This was true even for CIP, where the PMCA was developed. Several factors appear to have limited the continued use of the PMCA. National agricultural research organizations typically focus on technical research. Researchers have few incentives to engage in what they view as distracting “development” activities, and the organizations have limited staffing and capacity in the social sciences. They are also hobbled by rigid budgeting and accountability rules that limit their ability to respond quickly and effectively to changing needs and opportunities in dynamic innovation

processes. Agricultural extension and development organizations are often more open to using systems approaches to promote innovation but lack the capacity and external linkages to work effectively with researchers and other service providers that need to be involved in innovation processes. To use the PMCA, R&D organizations need to identify good facilitators that are willing and able to work with a systems-oriented R&D approach, are familiar with the local context of VCD, and are able to stimulate and maintain the interest of a diverse group of value-chain actors and service providers throughout the PMCA process. They also need external financial support for capacity development and field operations.

Flexible project management arrangements are important to allow local teams to adjust the project workplan in response to changes in the external context, partnerships, policies and the development of innovations, and not be bound by a rigid plan. Unfortunately, international development agencies tend to prefer projects that promise measurable outputs and outcomes in short periods of time, discouraging the use of systems approaches with unpredictable timelines and whose results emerge over time often in unpredictable ways. Finally, the international organizations and development agencies that wish to support inclusive value-chain innovation often want to use their own systems and value-chain approaches, rather than one developed by another organization.

Notwithstanding these common barriers to broader use of the PMCA, there are two noteworthy examples of the scaling of the PMCA approach, with no direct involvement of CIP or Papa Andina. The initial Ugandan work (Case 2) stimulated the greatest further uses of the PMCA. This is principally a case of outscaling in the same sphere of influence. Here, the facilitators – all women – based in several local R&D organizations formed an informal community of practice for exchanging experiences, providing mutual support and promoting the PMCA in Uganda and in neighboring countries. As described in Case 7 and in the Annex to this paper, the Ugandan facilitators have continuously been on the lookout for opportunities to apply the PMCA and have developed successful proposals for using the PMCA in several commodity chains.

The second case features upscaling with key engagement of a higher policy sphere. Natural Resources International who supported the PMCA work in Bolivia and Uganda included the approach in an inventory of technologies which were eligible for support under the *Research into*

*Use Programme* which they managed for DFID (see Annex). In 2008, the *Research into Use Program* approved a grant to iDE – an international NGO that promotes entrepreneurship and market-based solutions to poverty – to apply the PMCA in vegetable value chains in Nepal (see Annex section A.4). iDE has reported that the PMCA helped build relationships and trust among vegetable market chain actors, leading to increased vegetable production and earnings for farmers.<sup>11</sup> Significantly, the Nepalese work also paved the way for a later application of the PMCA in a large international food security project (Case 8). Based on its positive experiences with the PMCA in Nepal, iDE teamed up with WorldFish<sup>12</sup> and several local organizations in Nepal and Bangladesh, to use the PMCA as the guiding framework for the aquaculture component of the “Agriculture and Nutritional Extension Project” (ANEP), with funding support provided by the European Union. Results of this work have been reported in several research reports and publications by Gurung, Jahan and colleagues (See Annex Table A1).

In these two cases, scaling of the PMCA was promoted by the presence of strong local organizations with development mandates and previous successful experience with the PMCA and by key individuals who championed use of the PMCA. One additional feature that was missing to achieve broader scaling was a stronger promotional strategy. Beyond the publication of manuals and guidelines there was no sustained effort at broader promotion beyond those made by its direct developers. Here the association of the PMCA with Papa Andina – a boundary organization hosted by CIP – may have been a weakness. CIP never adopted PMCA as a core methodology in the same way that IDRC mainstreamed and promoted Outcome Mapping, FAO promoted Farmer Field Schools (FFS) or the World Bank promoted Training and Visit Extension. A recent assessment of the history of participatory research at CIP has shown that while CIP has served as a nursery for innovation in participatory research methods, the center has been less successful to promote sustained use (Ortiz et al., 2020).

Nevertheless, even in the absence of a strong promotional strategy PMCA was out scaled and upscaled in the cases we mentioned. In addition, as can be seen in the Annex to this paper, the PMCA has been applied with lower levels of fidelity and minimal results in some other cases. These

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<sup>11</sup> <http://lib.icimod.org/record/28269/files/App6.pdf>.

<sup>12</sup> <https://www.worldfishcenter.org>.

were usually led by research organizations that did not share leadership of the PMCA exercise with strong organizations with development mandates; the lead organizations did not have previous experience with the PMCA; and they lacked the expertise for facilitating participatory innovation processes.

## 7. Lessons

Based on our analysis of experiences with the PMCA, we have formulated six lessons with implications for future efforts to promote inclusive innovation in agricultural value chains.

**1. *A formal systems approach like the PMCA, which combines elements of collective action, AIS and VCD, can be effective in stimulating inclusive innovation in agricultural value chains.***

Most AIS approaches focus on promoting innovation in agricultural production, and most VCD approaches focus on analysis of value chains, improving chain governance, or strengthening the ability of farmers' organizations to link smallholders with the market. A unique feature of the PMCA is its combination of AIS and VCD approaches to stimulate inclusive innovation in agricultural value chains. Our analysis shows that when the PMCA engaged diverse stakeholders in co-innovation processes in the context of private-sector development, this stimulated a range of interlinked commercial, technical and institutional innovations that benefitted small-scale farmers as well as small- and medium-sized enterprises along the value chain.

**2. *Experience with the PMCA shows how collective action can be used to strengthen bridging and linking social capital in ways that promote inclusive innovation in agricultural value chains.***

In the context of agricultural development, collective action is usually advocated to strengthen bonding social capital: for example, strengthening farmer organizations so they can play more effective roles in managing resources, providing services or marketing agricultural commodities. A unique contribution of the PMCA has been to show how strengthening linking social capital can contribute to inclusive innovation. Smallholder farming communities need linking social capital with outsiders to bring in additional resources and represent their interests. It also allows them to connect with professional knowledge systems to improve their production and marketing practices. By strengthening interaction among diverse actors toward common goals, the PMCA has fostered improved communication, social learning and trust, all of which have facilitated joint R&D activities.



The results have included commercial, technical and institutional innovations as well as strengthened relations for future collaboration. Strengthened relations between farming communities and agricultural service providers have aided in the articulation of farmer's need for research and other services and improved the responsiveness of professional groups to farmers' needs. As Meinzen-Dick et al. (2009) have noted, this type of institutional investment is time-consuming and the results are often intangible, but it can make the difference between inclusive and exclusive development.

**3. *Systems approaches for stimulating inclusive innovation in agricultural value chains, such as the PMCA, require excellent facilitation / innovation brokerage.***

The PMCA is a complex type of intervention, the success of which relies heavily on the expertise and drive of facilitators or innovation brokers. The PMCA User Guide presents principles, guidelines and tools for using the approach. But local facilitators must design and implement specific strategies tailored to fit local circumstances. In the cases analyzed, successful PMCA facilitators exhibited an understanding of the approach's goals and principles, the local context of VCD, and marketing concepts and strategies as well as the ability to identify and utilize new information and resources to overcome challenges that presented themselves during innovation processes. Being based in a recognized research or development organization bolstered the legitimacy of facilitators. Taking part in training workshops helped strengthen their capacity and confidence to perform the varied tasks expected of them. Backstopping and mentoring from the PMCA's developers and experienced practitioners, and face-to-face exchanges were especially important for transferring tacit knowledge to inexperienced facilitators. This was especially true for marketing concepts and strategies, an area in which very few of the PMCA facilitators had formal training or previous experience, and which is often a weakness in R&D organizations.

**4. *An approach like the PMCA that promotes inclusive innovation in value chains can produce greatest results when it is implemented as an integral part of a broader development effort.***

On its own, the PMCA should not be expected to have a large impact on broad development goals such as poverty reduction, gender equity or biodiversity conservation. For wider transformational impact, the PMCA needs to be part of a broader development effort where it can play a key role in linking the broader effort to actual demands and opportunities in the value chain. Depending on

the local context, important complementary interventions may involve agricultural policy support, public awareness, advocacy, strengthening farmers' organizations, or support for scaling up innovations after the PMCA exercise has been completed.

**5. *The most appropriate institutional home for a systems approach for stimulating inclusive innovation in value chains may be a "boundary organization," not the core program of a research or development organization.***

Those of us who work with and promote the use of participatory research, AIS and VCD approaches often lament the fact that these approaches are seldom institutionalized or mainstreamed in the core programs of research or development organizations (Ashby, 2009; Hall, 2009; Hellin, 2012). However, the most logical institutional host for these approaches may not be a traditional research or development program but a boundary organization with a mandate for linking research with practical action. The PMCA was developed by the Papa Andina Regional Initiative, which was hosted by an international agricultural research center (CIP), supported by a development agency (SDC) and governed by a directorate with representatives from CIP, SDC and national stakeholders. In the terminology of innovation studies, Papa Andina functioned as a boundary organization with lines of responsibility and accountability to both national and international stakeholders. Similar programs have been hosted at other CGIAR centers to enhance the utilization and benefits of research in specific locations (Kilelu et al., 2013; Stur et al. 2016). As innovation brokers, these programs support the work of national partners who take the lead in facilitating innovation within their jurisdictions. Whereas the mandate of CGIAR center is to conduct research that addresses global issues, a boundary organization hosted at an international center, such as Papa Andina, can play a useful role in linking the center's international programs with national and local development initiatives. And in this context, the PMCA has proven its ability to play a useful role in fostering inclusive innovation.

**6. *Scaling of innovations and mainstreaming use of PMCA require resources and a focused strategy***

Two aspects of scaling are relevant for our analysis of the PMC: the scaling of the commercial, technical and institutional innovations that emerged from PMCA exercises and the scaling of the approach itself.

As shown in cases 1 and 8, government support and beneficial policies, the participation of committed private sector and the stable support of international donors strengthened the innovation process that generated broader effects at the micro and sectoral levels. In the case of Peru, advocacy and the strong participation of the Ministry of Agriculture contributed to the upscaling of commercial, technical and institutional innovations.

Although we could characterize the PMCA as a moderately successful VCD approach used in the eight cases reported here and with considerable influence in the wider literature and development context, it is important to understand the barriers to broader use. More upscaling of the PMCA could have benefitted from a greater concentration of effort and clear scaling strategies supported by training, promotion at international meetings and the resources to enhance its dissemination and use. Research is still needed to analyze the obstacles to scalability, and the different arrangements and factors required for promoting the use of approaches like the PMCA in different contexts and with different R&D organizations. This could throw light on how successful approaches for stimulating inclusive value-chain innovation could be scaled strategically so that they could have broader uptake and impact.

## **ANNEX: SUMMARY INFORMATION ON DOCUMENTED PMCA APPLICATIONS**

Since the PMCA was developed for use in potato value chains in the Andean region of South America, the approach has also been used in other value chains and regions. It is impossible to know all the instances in which the PMCA has been used or where it has inspired participatory VDC under other names. From internet searches, personal communications, and a review of project reports and research publications, we have identified applications of the PMCA in value chains for aquaculture, cassava, coffee, dairy products, fruits, handicrafts, hot peppers, organic and “typical regional” products,<sup>13</sup> pineapples, plantains, potatoes, sesame, sweetpotatoes, tomatoes, vegetables, wine and yams in Africa, Asia, Eastern Europe and Latin America.

This annex presents summary information on documented applications of the PMCA. For each case we provide information on the value chain involved and its location, the period during which the PMCA was implemented, the program or project in which the PMCA was used, the main funding sources, and the references available for the case. Where information is available, we note the involvement of key individuals and organizations in the diffusion and application of the approach.

The applications are presented in the order in which they were implemented, beginning with the original Peruvian case (2003-2005) and ending with an application with root crops and bananas in Uganda (2014-2017).

In the body of the Working Paper, we analyze eight of the best-documented cases, for which sufficient information is available to apply our analytical framework (Section 4). In the remainder of this annex and in Annex Table 1, we indicate which of the cases are analyzed in the main body of the working paper.

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<sup>13</sup> This term is used in Albania to refer to a wide range of home-made products of known origin, including pasta, goat cheese, nuts, honey, mushrooms, tea, and dried fruits and vegetables.

***Development and initial applications of the PMCA with potatoes in Peru (2003 – 2005) – Case 1***

The first applications of the PMCA were in highland Peru. These were facilitated by a CIP marketing specialist (Bernet) in the context of the Papa Andina regional initiative and a comprehensive sector-development effort supported by the Swiss Agency for Development and Cooperation (SDC), known as the Project for Promoting the Competitiveness of the Potato Sector in Peru (INCOPA). This work has been analyzed in several peer-reviewed publications (see Annex Table 1 for references).

***Early applications of the PMCA with potatoes in Bolivia and Ecuador (2004-2011)***

Beginning in 2004, also under the umbrella of Papa Andina, the PMCA was tested in Bolivia and Ecuador. The first application in Bolivia focused on the value chain for traditionally processed native potatoes on the Bolivian *Altiplano* (Velasco et al., 2011). This work was led by the PROINPA Foundation – an autonomous research and development organization for Andean crops that had emerged from an earlier SDC-supported project (Gandarillas et al., 2007). This PMCA application also linked to the *Innova* project, which was supported by the Crop Post-Harvest Programme of the United Kingdom’s Department for International Development (DFID) and the Natural Resources Institute (NRI). Beginning in 2008, the PMCA was tested in Ecuador, where national collaborators felt strongly that potato traders and processors should not be involved as equal partners in the PMCA thematic groups. As a result, the exercise evolved away from value-chain innovation toward establishment of a farmers’ organization that provided a range of services, including negotiation with input suppliers, traders, and processors (Thiele et al., 2011a).

***Further development of the PMCA with root crops and vegetables in Uganda (2005-2007) – Case 2***

From 1995 to 2005, DFID’s Crop Post-Harvest Program and Natural Resources International had supported research on sweetpotato post-harvest systems in Uganda. A review (Hall et al., 1998) concluded that while the research had been of high quality, the farm-level impacts had been limited by market problems, and that marketing and VCD should receive more attention in future. Knowing of the early successes with the PMCA in Peru and Bolivia, DFID and NRI encouraged CIP to apply the PMCA in Uganda’s sweetpotato value chain, and offered financial support for preparing an English-language User’s Guide, training Ugandans and carrying out Phase 1 of a PMCA exercise.

In response to requests from Ugandan stakeholders, the scope of the exercise was expanded to also include potatoes, tomatoes and hot peppers, which were felt to have promising futures in high-value markets. This application involved a comprehensive PMCA capacity-development effort that involved:

- participatory planning and decision-making;
- negotiation with senior Ugandan R&D managers to foster institutional commitment and support fund raising;
- A study tour for 17 Ugandans to Bolivia and Peru, to meet with PMCA practitioners and observe work and early results;
- training workshops that employed the *PMCA User Guide* and complementary training materials,
- backstopping and coaching by experienced PMCA facilitators from Peru and Bolivia;
- knowledge sharing among the Ugandan PMCA practitioners working in different commodity teams; and
- periodic learning-oriented reviews and evaluations to improve implementation of the approach and to document results (Horton *et al.*, 2010:387).

This PMCA application was led by Ugandan consultants who were contracted by CIP and posted at the offices of Regional Potato and Sweetpotato Improvement Network in Eastern and Central Africa (PRAPACE) in Kampala. A team of six facilitators – all women – was recruited from several Ugandan R&D organizations. The Mukono Zonal Agricultural Research and Development Institute (MUZARDI), a branch of Uganda’s National Agricultural Research Organization (NARO), played a prominent role in this case. Based on progress, at the end of Phases 1 and 2, CIP and the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) provided additional funding to complete the PMCA exercise. After this application of the PMCA, several of the facilitators and others involved have promoted the approach and have led other applications (see sections A.10 and A.12 below).

***Testing the PMCA and other participatory approaches in the Andean Change Alliance (2007 – 2009) – Cases 3 and 4***

After becoming head of CIP’s Social Sciences Department, one of the PMCA’s developers (Thiele) led the Andean Change Alliance, which sought to contribute to sustainable livelihoods in poor communities by improving their participation in agricultural innovation processes (Thiele *et al.*, 2011b). Funding for the Alliance was provided by the Department for International Development of

the United Kingdom government (DFID).<sup>14</sup> CIP partnered with the International Center for Tropical Agriculture (CIAT) and agricultural R&D professionals in Bolivia, Colombia, Ecuador and Peru to test participatory research-for-development approaches. The PMCA was the only one of the participatory approaches that was documented thoroughly in a user guide and an implementation protocol.

Local teams implemented the PMCA with support from a CIP consultant (G. Lopez). Eight applications of the PMCA were initiated, of which five were completed. Two applications in Bolivia and one in Peru were discontinued when local teams diverged significantly from the intervention protocol, by focusing on production-related problems (rather than marketing opportunities) or by skipping key steps in the approach. An additional case in Ecuador was completed, but diverged significantly from the PMCA protocol, by excluding market agents from the thematic groups. The four completed applications that were implemented with minimal fidelity were systematically documented and analyzed (Horton et al., 2011, 2013b). One of the applications, with coffee on the eastern slopes of the Peruvian Andes (Case 3), was led by the international NGO, Practical Action. Other applications with dairy products in Oruro and native potatoes in Northern Potosi (Case 4), in Bolivia, were led by local agricultural service organizations (the Foundation for Services for Rural and Agricultural Development (SEDERA) and the Center for Development Support in Northern Potosi (CAD), respectively) and were backstopped by PROINPA. Another application, with yams on Colombia's north coast, was implemented by a Colombian NGO, Corporación PBA.<sup>15</sup>

***Using the PMCA to connect vegetable growers to markets and service providers in Nepal (2008-2009)***

In 2006, DFID established a "Research into Use" (RIU) program to help achieve wider uptake of promising research products generated by research it had supported during the previous decade (Reddy et al., 2012). Based on the positive results of DFID-supported work with the PMCA in the Andes and Uganda, supported by DFID, DFID selected the PMCA as one of the research products it wished to scale up. Based on a competitive grant process, RIU selected 13 projects, one of which

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<sup>14</sup> Additional information on the Alliance is available in Thiele et al., 2011 and at: <http://www.cambioandino.org>.

<sup>15</sup> Information on this organization is available at: <http://corporacionpba.org/portal/acerca-de-la-corporacion-pba>.

involved applied the PMCA in vegetable chains in Nepal. This project was led by International Development Enterprises (iDE),<sup>16</sup> an international NGO that promotes entrepreneurship and market-based solutions to poverty. iDE viewed the PMCA as a tool for strengthening farmers' organizations to "enable them to respond to different types of market opportunities and to build trust among different agencies" (Reddy et al., 2012: 6). iDE adapted the PMCA to fit the local context.

*"While sticking to the broad framework, iDE-Nepal customized the different activities. For instance, the thematic groups suggested in the approach were promoted more as mechanisms for different agencies to come together to discuss and jointly plan activities.... Different actors from the thematic groups were encouraged and trained to use meetings and other activities as mechanisms for building interactions and trust among different stakeholders" (ibid: pages 6; 15).*

iDE has reported that the PMCA helped build relationships and trust among vegetable market chain actors and has led to increased vegetable production and earnings for farmers.<sup>17</sup> Adapted versions of the PMCA were later employed in other projects implemented by iDE and by some district-level agencies in Nepal. Since the initial application with vegetables has not been documented in a research publication, this application is not included in our analysis as a separate case. This experience is significant, however, because it led to a later application of the PMCA in aquaculture value chains in Nepal and Bangladesh (see below).

***Using the PMCA and developing complementary approaches for potato value chain development in Indonesia (2008 – 2009) – Case 5***

Since the 1970s, the Indonesian Vegetable Research Institute (IVEGRI) has engaged in potato research and development, often with support from CIP. The practical impact of these supply-driven efforts has been limited by marketing constraints. For this reason, in 2008, in collaboration with CIP and the Australian Centre for International Agricultural Research, IVEGRI launched a project to improve the marketing of potatoes and other vegetables in West and Central Java (Horton et al., 2013a). The PMCA was introduced to stimulate innovation in potato value chains. Initially, the consultancy firm SwissContact agreed to lead the PMCA application. But when the project was approved, the firm decided that it could not effectively play this role, and CIP stepped

<sup>16</sup> Information on iDE is available at: <https://www.ideglobal.org/>.

<sup>17</sup> <http://lib.icimod.org/record/28269/files/Appr6.pdf>.



in to provide leadership, via a staff member at CIP's office in Bandung. PMCA developers (Thiele and Bernet) and staff members from CIP's regional office in the Philippines also backstopped the effort. Spurred by a participatory review of experiences at the end of Phase 3, the Indonesian team began offering early innovators with a set of "business development services" to provide continuing support for innovators after completion of the PMCA exercise. Additionally, to strengthen the capacity of farmers and their organizations to manage businesses and negotiate with traders and processors, the team also developed a complementary R&D approach known as the "Farmer Business School," which combines elements of the PMCA with the "Farmer Field School" approach, which was developed earlier in Indonesia to promote integrated pest management (Feder et al., 2004; Prain et al., 2020).

***Facilitating innovation with Amazonian fruits in Bolivia and Peru (2008 – 2010)***<sup>18</sup>

The Latin American regional office of the World Agroforestry Centre, located on the CIP campus in Peru, employed the PMCA as one element of a project aimed at improving the competitiveness of value chains for Amazonian fruits and demonstrating the utility of an innovation approach that could significantly increase the incomes of participating farmers. The project involved several R&D organizations in Bolivia and Peru and received financial support from a regional fund for agricultural R&D in Latin America and the Caribbean, known as FONTAGRO.<sup>19</sup> The project involved collection and characterization of germplasm; biological research on plant propagation, management of agroforestry systems and extraction of oil and production of flour; and training on several technical topics. "PMCA workshops" organized in the two countries included group activities related to familiarization with value chains, analysis of opportunities and development of innovations. In Peru, the work centered in Tarapoto where there was growing demand for Amazonian fruits. Group work, supported by a CIP consultant (López), involved several smallholder farmers, the women's processing group that had been involved with the earlier work on coffee (Case 3) and researchers working with Amazonian fruits. The Bolivian team, based at the Research

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<sup>18</sup> This section is based on a 2012 presentation on the project ([https://www.fontagro.org/wp-content/uploads/2007/01/pp\\_final\\_infotec\\_07\\_52.pdf](https://www.fontagro.org/wp-content/uploads/2007/01/pp_final_infotec_07_52.pdf)), an unpublished project report entitled "Facilitando la innovación en la cadena de valor del copoazu: Sistematización de las experiencias del Proyecto FRUTAM en Bolivia" (Octubre 2011), and personal communications with Jonathan Cornelius.

<sup>19</sup> <https://www.fontagro.org>.

Center for Tropical Agriculture in Santa Cruz,<sup>20</sup> found it difficult to stimulate the interest of processors or traders because of the limited consumer demand for the fruits being addressed in the project. According to the first project leader (Cornelius), the short duration of the project and changes in leadership limited the results and documentation of this case.

***Reframing support for organic agriculture in Albania (2009 – 2011) – Case 6***

Once the communist regime ended in Albania, SDC was among the first donors to support agricultural projects in Albania. From 2001 to 2009, the project “Sustainable Agricultural Support to Albania” (SASA) worked to improve the economic situation of rural people through environmentally friendly production practices and market-oriented efforts. The Swiss Research Institute of Organic Agriculture (FiBL) implemented this project together with several local partners. FiBL started off with a “supply-push” strategy that included establishment of national systems for organic regulation and certification, an extension service for organic producers and market support for producers, processors and exporters of organic produce. An external review in 2009 concluded that SASA had been successful in developing services for the organic sector. However, there were limited organic sales, putting the financial viability of the new services, mainly offered by project staff, at risk. As a result, SDC provided a two-year extension focused on market development. One of the developers of the PMCA at CIP (Bernet), who had recently moved to FiBL, used the PMCA to guide and structure the marketing effort while expanding the scope of the project by including not only organic products, but also typical regional produce.

***Conserving and promoting native hot peppers in Peru and Bolivia (2010 – 2013)***

In 2010 Bioversity International, which also has its Latin American office on the CIP campus in Peru, initiated a project to develop commercial, institutional and technical innovations that could improve the welfare of farmers and other actors in markets for high-value products. This project, funded by the German Development Agency (GIZ), combined research and VCD and included elements of the PMCA. Multi-stakeholder platforms established in Bolivia and Peru engaged a broad range of stakeholders, including farmers and farmer organizations, traders, processors, universities, foundations, researchers and other agricultural service organizations as well as local and national public officials. During workshops in each country, stakeholders identified commercial

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<sup>20</sup> <https://www.ciatbo.org>.

opportunities and potential new products for high-value markets. However, thematic working groups were not established, and collective action was limited to interactions and information exchanges that took place at the three meetings of multi-stakeholder platforms in each country. Results of this project were reported in a final project report (Jäger and Amaya, 2013), but no peer-reviewed publications were produced.

***Improving smallholders' access to markets in Kosovo (2011 – 2012)***

In 2011, the Riinvest Institute won an SDC tender to implement the PMCA as part of a horticulture promotion project in Kosovo. The goal of the PMCA component was to develop new marketing opportunities for rural areas. A team based in Riinvest led the implementation of the PMCA, with methodological backstopping from FiBL. More than 150 stakeholders participated in the project, participating on thematic groups set up for grapes and wine, fruits, and berries. In collaboration with existing producer associations, regional brands were created for quality grape products and fresh and processed fruits, which were launched at the end of the project. However, due to an apparent lack of commitment and resources, the farmer associations did not effectively market these promising products.

***Developing the value chain for indigenous African leafy vegetables in Central Uganda (2011 – 2012) – Case 7***

Beginning in 2007, Uganda's Rural Agency for Sustainable Development (RASD) collaborated with the University of California at Davis to promote the production and marketing of indigenous African Leafy Vegetables (ALV) in Central Uganda. This work was supported by a grant from USAID. Initially the project focused on mapping ALV production systems and diagnosing and overcoming production constraints. Little progress was made in the project's marketing component until 2011, when NARO-MUZARDI was invited to apply the PMCA in the indigenous ALV chain. Since the project's leaders at UC-Davis had no knowledge of the PMCA, the Director of MUZARDI, who had facilitated sweetpotato work during the earlier PMCA exercise, traveled to California to explain the approach. This case was developed as an action research project (Sanya et al., 2018).

***Structuring the Agriculture and Nutritional Extension Project in Bangladesh and Nepal (2011 – 2014) – Case 8***

Based on the positive results achieved with the PMCA in vegetables value chains in Nepal, iDE proposed the PMCA as a framework for a large food security project in Nepal and Bangladesh. The “Agriculture and Nutritional Extension Project” (ANEP) was funded by the European Union. The aquaculture component of ANEP was implemented by a consortium led by WorldFish, and iDE facilitated work with the PMCA in Nepal. Results of this work have been reported in several research reports and publications by Gurung, Jahan and colleagues. The Proposal for the CGIAR Research Program on Aquatic Agricultural Systems, also led by WorldFish, presented the basic PMCA structure to guide its research on equitable access to markets. However, this program viewed the PMCA as a *tool for market analysis* rather than an *approach for stimulating innovation* in value chains. Of the activities associated with this research program, ANEP was apparently the only one that was carried out in accordance with the basic principles of the PMCA.

***Combining elements of the PMCA with flexibility in project design, budgeting and management in Uganda (2014-2017)***

The ENDURE project aimed to reduce post-harvest losses with roots, tubers and bananas through innovation in post-harvest management in potato, sweetpotato, cassava and banana, to improve food security and increase income for smallholders, especially women. The project was led by CIP and implemented in collaboration with other international research organizations and local collaborators, including NARO, universities, NGOs and private-sector actors. Separate teams worked on each of the four commodities. All four of them used the PMCA, but the banana team followed the principles of the approach most closely. Project implementation, early results and lessons are reported in Bentley et al. (in press).

**Annex Table 1. Summary information on documented applications of the PMCA.**

Value chain / location	Case number <sup>1</sup>	Implementation period	Program or project (donor) <sup>2</sup>	Lead organization <sup>2</sup>	References
Native potatoes / highland Peru	1	2003– 2005	Papa Andina & INCOPA (SDC)	Papa Andina, INCOPA	Thiele and Bernet 2005; Meinzen-Dick et al., 2009; Ordinola et al., 2011, 2013a, 2013b, 2014, 2018; Horton and Samanamud 2013; Tobin et al., 2016a, 2016b; Sarapura et al., 2017.
Native potatoes in Bolivia & Ecuador		2004-2011	Papa Andina, Innova (SDC, DFID)	PROINPA, INIAP	Velasco et al., 2011; Thiele et al., 2011a; Montesdeoca et al., 2013.
Potato, sweetpotato, tomato & hot pepper / central Uganda	2	2005-2007	Papa Andina (CIP, NRI, ASARECA)	Papa Andina, PRAPACE	Horton 2008; Akello et al., 2010; Horton et al., 2010; Mayanja et al., 2012, 2013, 2014.
Coffee / San Martin, Peru	3	2007-2008	Andean Change Alliance (DFID)	Practical Action	Horton et al., 2011; 2013b; Thiele et al., 2011b; Rodriguez and Lopez 2019.
Dairy / Oruro, Bolivia		2007-2009		SEDERA	
Native potatoes / Northern Potosi, Bolivia	4	2007–2008		CAD	
Yams / Colombia's north coast		2008-2009		Corporación PBA	
Amazonian fruits / Bolivia & Peru		2008-2010	Improving Competitiveness of Amazonian Fruits (FONTAGRO)	World Agroforestry Centre	Cornelius 2012
Potatoes / West Java, Indonesia	5	2008-2009	Linking Farmers to Markets (ACIAR)	CIP, IVEGRI	Horton et al., 2013a

Value chain / location	Case number <sup>1</sup>	Implementation period	Program or project (donor) <sup>2</sup>	Lead organization <sup>2</sup>	References
Vegetables / Nepal		2008-2009	Connecting Growers with Markets & Suppliers (RIU-DFID)	iDE	Reddy et al., 2012; ICIMOD 2013.
Organic & typical regional products / Albania	6	2009-2011	Sustainable Agriculture Support to Albania (SDC)	FiBL	Mitrovic 2012; Bernet et al., 2014.
Native hot peppers / Bolivia & Peru		2010-2013	Conserving & promoting native hot peppers in Bolivia & Peru (GTZ)	Bioversity	Jager and Amaya 2013.
Typical regional produce / Kosovo		2011-2012	Horticulture Project Kosovo (SDC)	Riinvest	Bernet and Kazazi 2012.
Indigenous African leafy vegetables / central Uganda	7	2011-2012	Increasing Farmers' Access to Markets for Indigenous Leafy Vegetables (USAID) <sup>3</sup>	NARO-MUZARDI	Sanya et al., 2018.
Aquaculture / Nepal & Bangladesh	8	2011-2014	Agriculture & Nutrition Extension Project (EU)	WorldFish, iDE	Gurung 2016, 2017; Jahan et al., 2014, 2015, 2018.
Root crops & bananas / Uganda		2014-2017	ENDURE (EU & IFAD)	CIP	Bentley et al. (in press)

1. The case numbers refer to those used for the eight cases analyzed in the main text of the working paper.
2. Acronyms used in this table are defined in the List of Abbreviations and Acronyms at the beginning of the working paper.
3. This project was carried out by MUZARDI-NARO, Uganda's Rural Agency for Sustainable Development (RASD) and the Horticulture Innovation Lab, UC-Davis, with funding from the USAID Feed the Future initiative.

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## About the Authors

Thomas Bernet is an agricultural economist holding a PhD from the Swiss Institute of Technology in Zurich, Switzerland. As part of his post-doctoral work focusing on how to stimulate market-driven value chain innovations, he championed the development of the PMCA at CIP by facilitating its first applications, in Peru. As part of the validation process, he then acted as a trainer and backstopper for the first applications of the PMCA in Africa (Uganda) and Asia (Indonesia). When starting to work for the Research Institute of Organic Agriculture (FiBL) in Switzerland, he introduced the PMCA in Europe, with applications in Albania and Kosovo.

André Devaux is an agronomist at the International Potato Center (CIP) where he served as coordinator of the Papa Andina Regional Initiative and as the Regional Director for Latin America and the Caribbean. He holds a PhD in Agriculture Science from the Université Catholique de Louvain, Belgium and has extensive expertise in potato production, food systems, and inclusive value chain development. He helped to guide the development and early implementation of the PMCA.

Guy Hareau leads the Social and Nutritional Sciences Division at CIP since 2016, providing disciplinary support in the areas of impact assessment, gender, value chain analysis and development, and behavioral change for improved nutrition. In this position he has been responsible for developing and implementing studies that demonstrate the organization's impact in reducing poverty and hunger around the world. He has written about the adaptation of PMCA to different contexts in Latin America. He holds an M.Sc. and a Ph.D. in agricultural economics from Virginia Tech (United States). He joined CIP in 2008 after working for 17 years at the National Agricultural Research Institute of Uruguay (INIA).

Douglas Horton is an independent applied researcher and evaluator. After obtaining his doctorate in economics from Cornell University, he served as head of the Social Science Department at CIP, program leader for management and organizational development at ISNAR, leader of the CGIAR Institutional Learning and Change Initiative (hosted by Bioversity) and leader of the CGIAR Knowledge Sharing Project (hosted by CIAT). Since 2004, he has participated in several reviews of PMCA work.

Gastón López Benavides is a specialist in marketing, value chain analysis, innovation studies and participatory methods. He has a degree in social anthropology from Peru's Universidad Nacional Mayor de San Marcos. Gastón was a member of the CIP team that developed the PMCA and facilitated numerous applications of the PMCA in the Andean region. He also coordinated the agri-business work of the Andean Change Alliance. He has worked as an independent consultant for FAO, IICA, ICRAF, BID, INDP and other international organizations and has authored numerous research reports and publications.

Sarah Mayanja is an agro ecologist currently working as a gender scientist with the International Potato Center (CIP) based in Uganda; since 2011. She holds a MSc in agro-ecology and is currently pursuing her PhD in Agro-ecology and food systems. Sarah led the implantation of Phase 2 and 3 of the first PMCA application in Uganda and later provided support to several PMCA exercises in East Africa. She has extensive experience in agricultural marketing and gender responsive value chain development.

Miguel Ordinola is an agricultural economist with extensive experience working in the fields of agri-business, project management, agricultural policy, marketing and business administration. From 2003 to 2011 he coordinated the Project for Innovation and Competitive in Peru (INCOPA). He has written numerous publications on applications of the PMCA and expanding the role of native potatoes in Peru. He has managed private and public-sector projects and has served as an advisor for national and international organizations. At present, he serves as an advisor for projects at CIP and teaches graduate-level courses at the Pontificia Universidad Católica del Perú.

Graham Thiele leads the CGIAR Research Program on Roots, Tubers and Bananas (RTB), bringing together multiple partners to improve food security and reduce rural poverty through research for development. In this role, since 2012 he has provided leadership to developing a shared vision, building strong partnerships and managing for outcomes. He joined CIP in 1994, focusing on innovation in value chains through public-private partnerships and contributing to participatory varietal selection and seed system development. Graham was one of the developers of PMCA, and in 2005, he became the leader of CIP's Social Sciences Division, where his work focused on targeting and priority setting for research, studies of the adoption of new agricultural technologies and participatory methods.

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**For more information**, please contact CIP Headquarters. Av. La Molina 1895, La Molina. Apartado 1558, Lima 12, Peru.

 +51 1 3496017  [cip-cpad@cgiar.org](mailto:cip-cpad@cgiar.org)  [www.cipotato.org](http://www.cipotato.org)  [@cipotato](https://www.facebook.com/cipotato)  [@Cipotato](https://twitter.com/Cipotato)  [@cip\\_cipotato](https://www.instagram.com/cip_cipotato)

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