

## Value Chain Development in Uganda: Lessons Learned from the Application of the Participatory Market Chain Approach

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### Abstract

The participatory market chain approach (PMCA) aims to stimulate innovations that improve the participation of small-scale farmers and processors in high-value market chains. From 2005 to 2007, the PMCA was introduced and applied on Uganda's potato, sweet potato, and vegetable market chains. Market observations and stakeholder interviews indicate that the PMCA has contributed to the knowledge and skills of market chain actors and service providers, as well as strengthened the social capital needed for effective innovation processes. Commercial, technological, and institutional innovations have emerged, including development of products like sweet potato crisps and flour and a hot pepper appetizer, better packaging for potato crisps and sweet potato flour, and contract farming arrangements. While some of the first innovations were only used for a short time, others are still being used today. Additionally, the PMCA produced innovation processes that triggered further innovations. Strengthened social networks have facilitated information sharing and business development. Farmers, including women, have improved their market earnings and family welfare. After their initial work with the PMCA, several facilitators have delivered PMCA training or used this approach in other market chain development projects. The Ugandan experience highlights the importance of providing business development services after the PMCA, capacity development for farmers to improve their responsiveness to changing market demands, and sustainable arrangements for innovation brokerage services.

**Keywords:** innovation; market chain; networks; social capital; value chain analysis

## Abbreviations:

aBi Trust – Agribusiness Initiative Trust  
 A2N-Uganda – Africa 2000 Network, Uganda  
 AIS – Agriculture Innovation System  
 ASARECA – Association for Strengthening Agricultural Research in Eastern and Central Africa  
 CIAT – International Center for Tropical Agriculture  
 CICS – Competitiveness and Investment Climate Strategy  
 CIP – International Potato Center  
 CORDAID – Catholic Organisation for Relief and Development Aid  
 DFID – Department for International Development, United Kingdom  
 FAO – Food and Agriculture Organization of the United Nations  
 FAUEX – Federation of Ugandan Exporters  
 FFS – farmers field school  
 FTBIC – Food Technology and Business Incubation Center  
 IITA – International Institute of Tropical Agriculture  
 IPTA – Innovation Platforms for Technology Adoption  
 KIT – Royal Tropical Institute  
 MUZARDI – Mukono Zonal Agricultural Research and Development Institute  
 NAADS – National Agricultural Advisory Services  
 NARO – National Agricultural Research Organization  
 NEMA – National Environmental Management Authority  
 NGO – nongovernment organization  
 OFSP – orange-fleshed sweet potato  
 PMCA – Participatory Market Chain Approach  
 PELUM- Participatory Ecological Land Use Management  
 PRAPACE – Regional Potato and Sweet Potato Improvement Network in Eastern and Central Africa  
 SNV – Netherlands Development Organization  
 SOSPPA – Soroti Sweet Potato Producers and Processors Association  
 RAAKS – Rapid Appraisal of Agricultural Knowledge Systems  
 RASD – Rural Agency for Sustainable Development  
 UC Davis – University of California, Davis  
 UIRI – Uganda Industrial Research Institute  
 UNBS – Uganda National Bureau of Standards  
 UNFFE – Uganda National Farmers Federation  
 UNSPPA – Uganda National Sweet Potato Producers Association  
 USh – Ugandan shilling

## Introduction

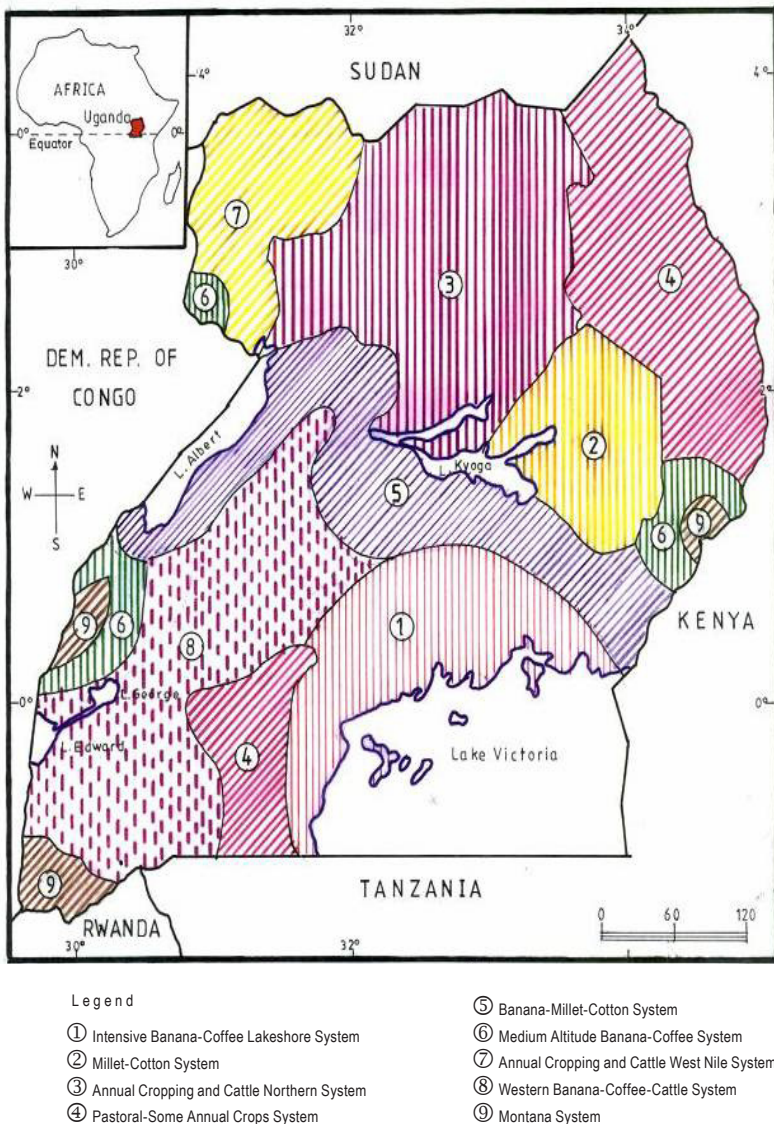
Markets play an important role in the economy and livelihood of rural people in developing nations. In Africa, agricultural development is taking place in the context of rapid urbanization and market integration. As a result, the livelihoods of small farmers—the major producers and suppliers of agricultural commodities—are increasingly influenced by the demands of urban consumers, market intermediaries, and food industries (Reardon et al., 2009). Smallholder farmers sell their produce largely in ad hoc spot markets, characterized by low prices and weak relationship between farmers and other chain actors.

In Uganda, agriculture plays an important role in the economy, accounting for over 20% of gross domestic product (UBOS, 2009). Agriculture employs three-quarters of the labor force (Republic of Uganda, 2010). Smallholder farmers, who depend primarily on agriculture for their livelihood, account for 85% of the country's population of 33 million (World Bank, 2010).

Farming systems in Uganda are strongly influenced by rainfall patterns and cover a broad range of activities, including food and cash crops and livestock keeping. Perennial crops are mainly grown in areas with high rainfall (1000–2000 mm) whereas annuals are grown in areas with low rainfall (500–1000 mm) and more pronounced dry season. There are broad variations in the crops and animals produced, depending on food preferences and resources available. According to the National Environmental Management Authority (NEMA), there are 9 types of farming system in Uganda (Figure 1). The most common farming systems include the intensive banana-coffee system (Region 1), the annual cropping and cattle system in the north (Region 3), the banana-coffee-cattle system in the west (Region 8), and the pastoral/annual crops system (Region 4). Most of the farming systems exhibit poor management practices that are exacerbated by growing population pressure (Osiru, 2006).

Agriculture in Uganda is weakly integrated with other sectors such as manufacturing (Juma, 2011). In many instances, smallholder farmers are poorly equipped to respond effectively to demands from consumer or other market chain actors. Market intermediaries and processors are frustrated by high transaction costs, small volumes, and uneven quality of supplies of agricultural produce, which hamper their operations. This is detrimental to the growth and development of agricultural markets.

Smallholder actors seldom participate in lucrative food chains, and when they do, their economic and social benefits are limited. Two broad strategies have been proposed to remedy this situation by shifting a market from ad hoc spot trading to chain partnership or a value chain: (1) strengthening relations between the value chain actors and (2) strengthening standards, regulations,



**Figure 1.** Map of Uganda showing areas with different types of agricultural systems (Source: Osiru, 2006)

policies, and services to coordinate and support trading activities (KIT and IIRR, 2008).

A number of value chain approaches have been used to spur market development in Uganda. These include the rural agro-enterprise approach by the International Center for Tropical Agriculture (CIAT), learning alliance for agro-enterprise development also by the CIAT, the value chain development approach of the Netherlands Development Organization (SNV), and Innovations Platforms for Technology Adoption (IPTA), among others. This paper examines the application of one such approach, the Participatory Market Chain Approach (PMCA). The following sections outline the methods used in the study, describe the development and main features of the PMCA, analyze the process whereby this approach was introduced and tested in Uganda, and assess the outcomes of PMCA application. The paper concludes with a statement regarding the efficacy of the PMCA and suggestions for improving applications of the approach in the future.

## Methods

In keeping with the participatory nature of the PMCA, the study was designed and conducted as an action research. It draws on a number of information sources, including project documents, key informant interviews, participatory review workshops, and direct observations. This study builds on a previous review of PMCA work in Uganda carried out in 2006 and 2007 (Horton, 2008; Horton et al., 2010). The earlier study involved a review of documents concerned with the introduction and application of the PMCA in Uganda; interviews with key informants in Peru, Bolivia, and the Netherlands;<sup>1</sup> and fieldwork in Uganda. Workshops were organized for stakeholders to review the work carried out and to develop innovation histories for each commodity chain.

The present study was commissioned by the International Potato Center (CIP) to update the earlier study and further analyze the Uganda case in the context of a global study of PMCA application and results. The study areas for this paper fall in Regions 1 and 2 for sweet potato, Region 1 for vegetables, and Region 9 for potatoes (Figure 1). During this follow-up study, 18 individuals were interviewed, including 11 market actors, 4 PMCA facilitators, and 3 market actors.

We visited marketplaces and interviewed market chain actors and other stakeholders to obtain information on the following topics:

- Activities carried out by facilitators, market chain actors, and others to develop innovations or promote the development of market chains

- Results achieved, with particular attention to changes in knowledge, attitudes, and skills; commercial, technological, and institutional innovations; inclusion, empowerment, and well-being; institutionalization of the PMCA; and prospects for the future
- Lessons learned that could improve future applications of the approach

## Introduction and Application of the PMCA

Growing urban and export markets are creating new opportunities for some crops and their producers. However, the ability of producers and rural production areas to benefit from these opportunities depends on their ability to access markets and collaborate with other market chain actors. Value chain development approaches, such as the PMCA, seek to strengthen beneficial linkages among market chain actors so that they work together more effectively in taking advantage of market opportunities (Donovan et al., 2012).

There are numerous approaches for value chain or market chain development. Most of the approaches, such as the Participatory Market Chain Analysis for Smallholder Producers developed by the CIAT, seek to increase benefits for smallholders through improved collaboration, coordination, and negotiation (Lundy et al., 2007). The PMCA is unique in its focus on bringing diverse market chain actors together to stimulate commercial, technological, and institutional innovations.

Innovation involves “the use of new ideas, new technologies or new ways of doing things in a place or by people where they have not been used before” (Barnett, 2004). Until recently, it was commonly assumed that agricultural research would automatically lead to innovation, which in turn would increase productivity as well as benefits for the poor. In essence, research results were assumed to flow through an “innovation pipeline” from basic research (conducted by advanced research institutes in the north) to strategic research (conducted by international agricultural research centers), on to applied and adaptive research (conducted by national programs), and finally to farmer adopters.

However, the relationship between research and innovation is not simple and linear but complex and interactive. As Hall (2009) notes that innovation is rarely triggered by agricultural research. More often, it results from an entrepreneur’s response to changing market opportunities. Innovation requires knowledge from many sources, which is shared among different people and combined in new ways. Also, innovation processes are usually specific to particular contexts. Each context has its own norms and traditions that reflect local history, culture, politics, policies, and power relationships.

Advocates of participatory research in the 1970s and 1980s believed the main challenge was to persuade biological scientists of the importance of including farmers in research teams (Ashby, 2009). Hence, considerable effort went into the development of methods for engaging farmers and researchers in participatory technology development. However, subsequent experience and research highlights the importance of involving a much broader range of stakeholders and focusing attention on innovation per se rather than more narrowly on research activities (World Bank, 2007; 2012). The PMCA was developed to promote innovation in market chains for agricultural products produced by smallholder farmers by promoting interactions of value chain actors through a structured process.

The PMCA was developed by the Papa Andina Regional Initiative of the CIP, with the aim of improving the competitiveness of potato market chains in the Andean region of South America. The approach centers on generating technological, commercial, and institutional innovations along market chains by increasing trust, confidence, and linkages among market chain actors and improving market access for small-scale farmers (Bernet et al., 2006; Bernet et al., 2008).

From the late 1990s, the Papa Andina regional program has worked to strengthen the capacity of R&D organizations in Bolivia, Ecuador, and Peru to increase the competitiveness and improve the livelihoods of small-scale potato farmers. In 2002, the CIP, Papa Andina, and the Project for Potato Innovation and Competitiveness in Peru began experimenting with a participatory approach to stimulate agricultural innovation known as Rapid Appraisal of Agricultural Knowledge Systems (RAAKS), which brings together diverse stakeholders in a participatory process that stimulates social learning, builds trust, and fosters innovation. Papa Andina employed RAAKS to bring small-scale farmers together with market chain actors, researchers, and other service providers to explore market opportunities. Additional steps were added for new product development, and a new approach emerged, which became known as the PMCA. In 2003, Bolivian members of Papa Andina began using the PMCA, and over the next few years, the approach was further developed and documented (Devaux et al., 2009). The PMCA first proved its usefulness when applied in market chains for native potatoes grown by small farmers in remote highland areas (Ordinola et al., 2008).

When the Crop Post-Harvest Programme of the Department for International Development (DFID) of the United Kingdom learned about the PMCA, it proposed trying it out with sweet potatoes and potatoes in Uganda. To this end, in 2005, Papa Andina partnered with the Regional Potato and Sweet Potato Improvement Network in Eastern and Central Africa (PRAPACE) and with local R&D organizations to introduce the PMCA to Uganda. Funding for the first phase of PMCA application was provided by the DFID. Funding for later phases was provided by the Association



for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and the CIP.

### **Ugandan Market Chains Examined in the Study**

Whereas the DFID originally proposed to test the PMCA with the potato and sweet potato market chains, participants at the first workshop in Uganda argued that it should also be applied in the market chains for tomatoes and hot peppers because of the increasing importance of these market chains for small farmers. Sweet potato is an important food crop for poor farmers in marginal agricultural areas. Potatoes and vegetables are important sources of cash income for smallholders operating in more favorable areas.

*Sweet potato market chain.* According to the Food and Agriculture Organisation of the United Nations (FAO), Uganda is the world's second largest producer of sweet potatoes, with production at 2.8 million MT in 2011 (<http://faostat.fao.org>). The orange-fleshed sweet potato (OFSP) is a highly nutritious variety that contains beta carotene, the vitamin A precursor, among other nutrients. The crop though has low dry matter content, which renders it unpopular to adults who prefer mealy sweet potato varieties. Smallholder farmers produce 80% of sweet potatoes for household consumption on small plots averaging about 0.16 ha in size. The main production areas include the Eastern, Northern, and Central Regions. Fresh roots are harvested on a piecemeal basis and sold in informal markets at farm gate, by the roadside, and in local rural and urban markets. Medium- to large-scale farmers may grow sweet potatoes on 0.8–1.2 ha of land, and these are mainly sold to urban markets. Processed products such as composite flour, chips, and snacks are rarely found on the domestic market.

*Potato market chain.* In Uganda, potato is grown as a food and cash crop. Production is estimated at 33,000 ha, with a corresponding tonnage of 154,000 t (UBOS, 2010). Formally, the crop was restricted to the southwestern and eastern highlands but has expanded to the mid-elevations of the country. The major potato-producing regions are the southwest, west, east, and northwest. The crop is mainly produced on small plots, with an average size of 0.12 ha, by smallholder farmers, who usually keep part of their harvest to use as seed for the next season. The main products traded include seed and ware potato for food and snacks. Farmers sell potatoes to village brokers and traveling traders who consolidate and deliver the commodity to wholesalers through brokers in peri-urban and urban markets. Cottage-level processors procure potatoes directly from the wholesalers or retailers and process snacks sold to supermarkets, retail shops, and schools.



*Vegetable market chain.* The vegetable market chain focuses on two commodities: hot pepper and tomatoes. Hot pepper cultivation was introduced recently in Uganda as an export crop targeting ethnic communities in Europe. The main type grown is the Scotch bonnet variety (red and yellow), which is renowned for its pungency and flavor. The main production areas are in Mpigi and Wakiso Districts in the Central Region and Kasese District in the Western Region. The crop is grown on smallholdings of usually 0.2 ha or less. The crop is propagated in a nursery bed using seed that is obtained from mature fruit. Under ideal conditions, yields of up to 24 t/ha have been registered at farmer level. Over 80% of marketable yield is sold to exporters through assemblers or agents. In 2008, Uganda exported 304 t of hot pepper worth US\$580,000 mainly to Europe. The United Kingdom is a major buyer, followed by the Netherlands, France, and Germany (UEPB, 2008). Limited domestic sales of fresh and processed peppers have been noted.

On the other hand, tomato is a key vegetable in Uganda that is produced all over the country throughout the year for food and income by smallholder farmers. The major producing districts are Mpigi, Wakiso, and Mukono in the Central Region and Hoima and Mbarara in the Western Region. Commercially, they are produced on small plots ranging from 0.1–1.6 ha as a single stand. Yields ranging from 17 to 32 t/ha have been registered in the Central Region (Mayanja and Hire, 2010). Tomato marketing commences at harvest, where the farmers seek various buyers, usually local assemblers, wholesalers, processors, and retailers; but sometimes, they cater directly to consumers. The most significant channel is from producers to wholesalers/assemblers who in turn sell to retailers in urban markets. Uganda also exports fresh tomatoes to neighbors like the Democratic Republic of the Congo, Rwanda, and Southern Sudan. Processed products from Uganda include sauces, ketchups, and solar-dried tomato rings, which are retailed in supermarkets and smaller retail shops.

### **The PMCA and Its Application in Uganda**

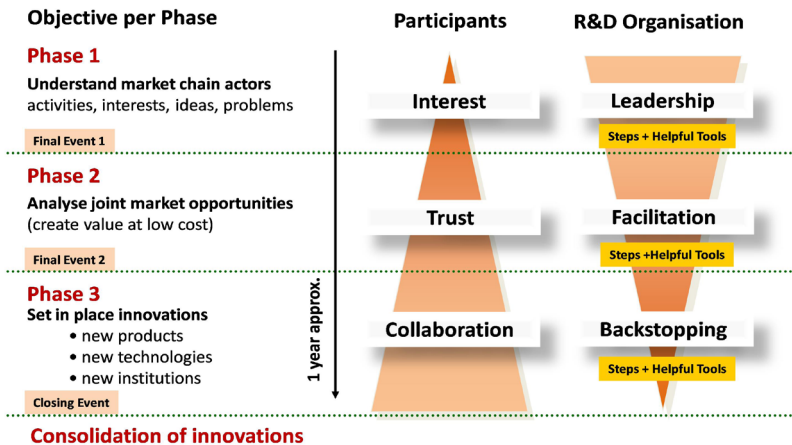
The introduction of the PMCA in Uganda in 2005 was championed by the management of the Crop Post-Harvest Programme funded by the DFID. The PMCA was a component of their broader strategy to promote the use of research outputs in innovation processes. They chose this particular approach as the mechanism through which demand for research outputs would be generated.

The PMCA engages market chain actors and public and private service providers in facilitated processes in which market opportunities are identified and exploited, leading to commercial, technological, and institutional innovations. As outlined in the *PMCA User Guide* (Bernet et al., 2006), the approach involves a structured process with three phases (Figure 2).

*Phase 1. Familiarization with the market chain and key actors.* In phase 1, an R&D organization initiates the PMCA process by selecting the market chains to work on, identifying potential R&D partners, and carrying out exploratory, diagnostic market research. Key goals of phase 1 are to become familiar with market chains and market chain actors and to motivate market chain actors to participate in the PMCA process. This phase is expected to take 2 to 4 months and may involve 20 to 40 interviews with diverse market chain actors.

In Uganda, the DFID provided funding for phase 1 of the PMCA, which ran from March to December 2005. Phase 1 commenced with an institutional survey during which R&D actors were identified. An introductory workshop was organized in which potato, sweet potato, and vegetable (i.e., hot pepper and tomato) commodity chains were selected for potential application of the PMCA and initial commodity groups were formed. This was followed by introductory/learning visits to Peru and Bolivia, after which diagnostic surveys on the commodity chains were conducted. Final events were held where chain actors were briefed on the results of the survey and later encouraged to form thematic groups along business opportunities that had been identified in the survey. A horizontal learning workshop was held to synthesize the findings and also to plan for phase 2.

*Phase 2. Joint analysis of potential business opportunities.* In phase 2, the R&D organization establishes thematic (commodity) groups and facilitates meetings designed to foster mutual trust and knowledge sharing among participants and to identify potential market chain innovations. To accomplish this,



**Figure 2.** Structure and process logic of the Participatory Marketing Chain Approach (PMCA) (Source: Bernet et al., 2006)

6 to 10 meetings are usually conducted in which the identified market opportunities are analyzed with the help of market study tools (e.g., Rapid Market Assessment) and one or two selected for implementation. At the end of this phase, a business plan is developed to guide implementation of project to tap the opportunities and presented at a final event to a wider audience who are also encouraged to join in the next phase.

In Uganda, phase 2 was implemented from March to August 2006. It commenced with the training of facilitators. They supported the thematic groups in analyzing joint business opportunities using various methods, including market surveys, focus group research, as well as exposure visits, in a bid to further evaluate the opportunities identified. Final events were held to present the results of each group and plans for phase 3. During phase 2, a review of the progress was also carried out (Horton, 2008).

*Phase 3. Development of market-chain innovations.* In phase 3, the market chain actors collaborate in practical innovation processes with support from R&D organizations. This phase focuses on the activities needed to launch specific innovations and may take 3 to 6 months and is guided by the business plan. It closes with a large event in which the innovations are launched to a wider group, including donors, politicians, and investors.

In Uganda, phase 3 commenced in February 2007 after a six-month break due to funding constraints. Activities commenced with training for facilitators and review of the business / work plans developed in phase 2. Work in thematic groups centered on designing and testing innovations using market surveys, focus group research, shelf-life tests, among others. Smaller working groups were used to carry out specific assignments and report back to the bigger group. Phase 3 ended with a final event for all the commodity groups in September 2007, where chain actors presented their innovations/products to policy makers, R&D actors, the media, and the general public. A review of the entire process was also done in the same month, and follow-up plans were agreed upon.

*Follow-up after completion of the PMCA.* After phase 3, a number of activities were undertaken to further consolidate gains in strengthening chain relations, commercialize innovations, and promote and institutionalize the use of the approach in R&D organizations in Uganda and elsewhere in the region. These activities were all carried out voluntarily by the original PMCA facilitators after the termination of funding and support for the initial PMCA exercise. Advice and support were provided to market chain actors to help them develop and market new products and submit successful funding proposals. Some of the original PMCA facilitators also served as PMCA trainers in workshops organized by development programs in Uganda.

*Factors that influenced implementation and results of the PMCA.* It is important to note that in practice, the PMCA has not always been implemented strictly following the ideal three-phase process in a well-planned and linear fashion. In the case of Uganda, some groups disbanded in the middle of the process. Some perceived opportunities early in the process and launched successful innovations during phase 2. Others that appeared to be on a roll during phase 2 lost momentum and failed to generate feasible innovations for phase 3. Some market chain actors have also continued to interact and innovate years after the end of phase 3. In Uganda, funding problems also delayed implementation of the PMCA. After the termination of DFID funding at the end of phase 1, there was a delay in obtaining funding for phase 2; and at the end of that phase, there was another delay before funding was acquired for phase 3. These delays disrupted and slowed down the PMCA implementation process. Due to delays, the PMCA facilitators found it difficult to maintain enthusiasm and momentum, and some participants dropped out of the exercise.

### **Key Actors**

Many organizations and individuals played key roles in introducing, validating, and refining the PMCA in Uganda. These ranged from academic and research institutions, as well as government and nongovernment organizations, to the private sector and trade organizations (Table 1). Each of these categories of institutions had clear functions. R&D institutions were responsible for introducing and facilitating the PMCA process. They also identified market chain actors and chain supporters who formed the thematic groups. The market chain actors and chain supporters worked together to identify and operationalize market opportunities. It is through this process that innovations were born. The potato group, for example, was led by the Semwanga Group, a consultancy firm with core team members from the Ugandan branch of the Africa 2000 Network (A2N-Uganda), the International Institute of Tropical Agriculture (IITA), and Agribusiness Initiative Trust (aBi Trust). The core team facilitated two thematic groups that had key actors like farmers' associations, processors, and traders to work together in a bid to address challenges identified in the market chain. The diversity of organizations involved reflects the important role of partnership in promoting pro-poor innovations (Hall et al., 2010; Horton et al., 2009). Different organizations also constituted the core groups focusing on the market chains for potato, sweet potato, and vegetables.

More than 100 market chain actors—including representatives of farmers' groups, local market agents, processors, managers of urban markets, and exporters—participated in the commodity group meetings in phases 2 and 3 of the PMCA. The number of participants varied from meeting to meeting. Those who participated frequently gained experience with the PMCA and

**Table 1.** Key actors who participated in the first PMCA application in Uganda

R&D Actors	Market Chain Actors
Potato group	
Semwanga Group	TomCris (processor)
Africa 2000 Network (A2N)–Uganda	Nyamarogo potato growers
Agribusiness Initiative Trust (aBi Trust)	Uganda National Sweet Potato Producers Association (UNSPPA)
International Institute of Tropical Agriculture (IITA) / Foodnet	Traders from Owino market
Sweet potato group	
National Agricultural Research Organization (NARO)	Bajjabasaga OFSP group
Soroti Sweet potato Producers and Processors Association (SOSPPA)	Soroti Sweet Potato Producers and Processors Association (SOSPPA)
Makerere University	Kasawo Grain Millers
International Potato Center (CIP)	Traders from Kalerwe market
Harvest Plus	Sulma Foods (processor)
	TomCris (processor)
Vegetable group	
Competitiveness and Investment Climate Strategy (CICS)	Sulma Foods (processor)
Federation of Ugandan Exporters (FAUEX)	Flona Commodities (processor/ exporter)
Uganda National Farmers Federation (UNFFE)	Kasper Foods (processor)
	TomCris (processor)
	Takajunge Women’s Development Association (producers)

tended to gain influence within their groups, playing the role of PMCA champion, and were the most active innovators during and after the PMCA process. For example, one potato processor and one vegetable exporter who participated throughout the PMCA process had considerable influence on their groups’ decisions. They also continued to develop innovations and champion innovative processes after the completion of the PMCA.

**Strategies to Introduce the PMCA in Uganda**

The strategies used to introduce the PMCA in Uganda built on previous development work with the PMCA in Peru and Bolivia. At the start of the PMCA application, PRAPACE identified relevant R&D organizations and encouraged them to participate. This was done through an institution survey, where information on the PMCA was provided and key personnel were invited to the first PMCA workshop. These actors formed a core team and were then responsible for identifying and engaging market chain actors

and chain support actors that participated in all three phases of the PMCA. Coordination, facilitation, lobbying, and advocacy were important since they enabled multistakeholder engagement and learning, which subsequently spurred the development of innovations.

Developing capacity for using the PMCA required more than knowledge and skill acquisition; it also required profound changes in attitudes, patterns of interaction, and, in many cases, organizational culture. This was because of the distrust that colors the interactions among the different groups that have a stake in market innovation processes. The capacity development strategy implemented in Uganda included a number of complementary components. Two study tours were organized for Ugandans to visit the Andes. These generated enthusiasm and confidence to apply the PMCA in Uganda. Action-oriented workshops, which involved practical use of PMCA tools, were organized at the beginning of each phase of the PMCA, enabling core team members to practice with the use of tools in real-world situations. Participatory learning and decision making by the core team and thematic group members fostered teamwork and empowerment.

The process of introducing the PMCA provided facilitators with opportunities to experiment directly with the approach. During the work in Uganda, the *PMCA User Guide* was refined through desk and email reviews by the core team and adapted to fit the local context. The opportunity to experiment with the PMCA improved facilitators' confidence and skills in applying the approach. Refinement and adaptation of the user guide ensured that the capacity development process responded to the needs and interests of those involved.

Horizontal evaluation workshops (Thiele et al., 2006; 2007) were organized to allow local participants to interact with external professionals who provided insights on gaps and areas that needed improvement. Horizontal evaluations combine self-assessment and external review by peers. The approach was developed by Papa Andina to evaluate R&D initiatives. The involvement of peers neutralizes the lopsided power relations that prevail in traditional external evaluations, creating a more favorable atmosphere for learning and improvement. The central element of a horizontal evaluation is a workshop that brings together a group of "local participants" who are developing a new R&D methodology and a group of "visitors" or "peers" who are also interested in the methodology. The workshop combines presentations about the methodology with field visits, small group work, and plenary discussions. It elicits and compares the perceptions of the two groups concerning the strengths and weaknesses of the methodology, provides practical suggestions for improvement (which may often be put to use immediately), and promotes social learning among the different groups involved; and it stimulates further experimentation with and development of the methodology in other settings.

The feedback provided from the evaluation (e.g., the need to strengthen business and marketing skills) helped sharpen the training agenda and improve facilitation of innovation processes (Bernet and Lemaga, 2006). Knowledge and experience sharing across commodity teams was vital, especially in phase 3, as were the periodic visits of the PMCA specialist from the CIP based in Lima, Peru, whose support was invaluable in refining innovations so as to make them attractive on local markets.

## Results and Discussion

The PMCA exercise generated a number of results, including new knowledge, skills, social networks, and capacity to innovate. Market chain actors generated a number of viable commercial, technological, and institutional innovations. The R&D actors (outside the core team members) and other chain supporters on the platform provided technical support, guidance and important links to industry, and policy that contributed to the generation of the innovations. The PMCA triggered rounds of innovation that continue until today.

### Commercial, Technological, and Institutional Innovations

The PMCA focuses on generating commercial innovations, which trigger technological and institutional innovations. In fact, many commercial innovations (such as the creation of a new product) embody both technical and institutional innovations as well (e.g., use of a new processing technology as well as a new contractual arrangement linking producers and processors). Most of the innovations reported are of a commercial nature (Table 2). However, it is likely that other technological and institutional innovations have occurred but have not been reported.

*Innovations in the potato market chain.* The potato group focused on improving the packaging, labeling, and sealing of locally produced crisps. This was done in response to challenges that would have otherwise hindered the group to seize the market opportunities identified in phases 1 and 2. Focus groups conducted with potential consumers revealed that though the taste of the crisps was excellent, the packaging needed a lot of improvement. This was because it was fabricated from low-grade plastic sheets, whereas the sealing was done with a candle. The group then sought better packaging materials, new sealing methods, and the services of a graphic designer to design labels. As a result, TomCris, a processor, invested in a simple heat-sealing machine and food-grade plastic packaging material and also opted for a new label for his products. The rebranded products were launched in the phase 3 final event.



**Table 2.** Status of innovations stimulated by PMCA, 2007 and 2011

Innovation	Type	Status in 2007	Status in 2011
<b>Potato group</b>			
Improved packaging and branding of potato crisps for high-end market (TomCris)	Commercial	In market	In local and export markets
Sealing machine for packaging (TomCris)	Technological	In use	In use
Contractual arrangements between TomCris and farmers group	Institutional	Being introduced	Worked for some time; currently not functional
Sorting and grading of potatoes for crisp production (TomCris)	Technological	Being introduced	In use
<b>Sweet potato group</b>			
New OFSP crisp (TomCris)	Commercial	In market	Not in market
New variety (Naspot 1) marketed in Uchumi supermarket and exported	Commercial	In market	In market; volumes sold increasing
Marketing concept for composite flour with OFSP: 2 brands (SOSPPA and Kasawo)	Commercial	Being introduced	SOSSPA in market, Kasawo not in production
Improved package for Kasawo OFSP composite flour	Commercial	In use	Not in use except occasionally in shows
Improved package for SOSPPA composite flour	Commercial	In use	In market
Marketing stall/kiosk for selling clean, sorted, and graded sweet potatoes in Kalerwe market	Commercial	Introduced in Kalerwe market	Moved to Matugga market; in use
Sweet Potato Market Chain Club for all market segments	Institutional	Formative stage	Did not take off beyond club status (nonfunctional)
<b>Vegetable group</b>			
Contract farming of hot pepper	Institutional	In use	In use
Tomato sauce	Commercial	Prototype	Not in market
Tomato chilli appetizer	Commercial	Prototype	In market
Hot pepper paste	Commercial	Prototype	In market
Pickled hot peppers	Commercial	Prototype	Not in market
Sliced and dried hot pepper	Commercial	N/A	New; exported

The packaging material and sealing machine were also adopted by one other processor. Though the quality of sealing is greatly appreciated by the clients, both processors reported that it slowed down the production process as users had to be extra careful so as to prevent crisp breakage.

After PMCA implementation, TomCris decided to brand his products for the various market segments in different ways to match the variations in purchasing power. The original brand and packaging material for the low-end market (i.e., schools, downtown markets). However, a new label in single color on new packaging material was used for the supermarkets, while a full-color label on new packaging material was used for the high-end market (i.e., airport café's, in-flight services). Though TomCris produces various pack sizes of crisps, the discussion will focus on the 50-g pack. Before the PMCA, TomCris used to sell 50-g packs of the product to the high-end market at US\$500<sup>2</sup>, with costs of production estimated at US\$350 per pack. Immediately after the PMCA in 2007, the price per pack increased to US\$600 and costs of production to US\$380. In 2011, each 50-g pack was sold at US\$800, and costs of production were estimated at US\$600 per pack (Tables 3 and 4).

There was an increase in net returns from 2005 to 2007 mainly due to the improved packaging and labeling. The decrease in net returns from 2007 to 2011, on the other hand, was attributed to increased production costs and also to competition from increasing number of processors in the market. Despite the decrease in net returns, the total sales for this product increased by 20% between 2007 and 2011. TomCris products still stand out in the market due to their outstanding quality and innovative packaging. This has enabled the processor to maintain presence in high-end markets. Potato crisps are TomCris's flagship product, and the visibility of the potato crisp product throughout the country helped in the marketing of the other products in the firm's portfolio.

TomCris established an arrangement to purchase sorted and graded potatoes from two farmer groups in Kabale, Western Region. This institutional innovation resulted from the need to source varieties suitable for crisp processing. Previously, the processor had to sort potatoes in the wholesale market, which was a slow and tedious process. An on-site visit by the processor to the farmers enabled them to understand the types of potatoes needed for crisp processing. In turn, the farmers visited the processor and were able to understand why some potatoes were not good for crisp processing. The processor also took the farmers to the wholesale market for them to see first-hand the kind of trouble the processor went through in sourcing potatoes. Following the visits, arrangements were made for delivery and payment of potatoes. This arrangement worked well for a few years. TomCris, however, has reverted to buying potatoes in Kampala, Central Region. The reasons for this include increased product and transaction costs, rendering it more cost-effective to source from the wholesale market.

**Table 3.** Costs and returns (USh) for TomCris potato crisps (50-g pack) and SOSPPA\* composite flour (1 kg)

	2005	2007	2011
Potato crisp pack (50 g)			
Cost per pack	350	380	600
Sale price per pack	500	600	800
Net returns	150	220	200
Number of packs sold per month	1150	1000	1200
Total net returns	172,500	220,000	240,000
Gross margin (%)	30	36	25
SOSPPA* composite flour (1 kg)			
Cost per kg	1800	2400	3000
Sale price per kg	3000	4000	5000
Net returns	1200	1600	2000
Kg sold per month	200	300	400
Total net returns	240,000	480,000	800,000
Gross margin (%)	40	40	40

**Note:** \*SOSPPA – Soroti Sweet Potato Producers and Processors Association

*Innovations in the sweet potato market chain.* The sweet potato group came up with a number of innovations including the production of crisps and two types of repackaged composite flour; establishment of a market kiosk for marketing cleaned, sorted, and graded sweet potatoes roots and other products; and a sweet potato market club comprising of various actors in the value chain. The OFSP crisps were a very popular product and were in great demand. However, the processor was unable to consistently source the raw OFSP roots from the producer groups that engaged in the PMCA. This was very frustrating as the processor almost lost some clients (e.g., supermarkets) who insisted on constant supply of both OFSP and potato crisps for continued business. The Kasawo Millers faced a similar fate as they failed to produce enough quantities of composite flour because farmers' groups took advantage of the growing demand (and higher profit) for fresh roots by selling them to other buyers. The sweet potato market club did not take off either. The actors were constrained by meeting costs, especially for those who had to travel long distances to attend meetings. Though contacts were retained through telephone, this also slowly tapered off with time due to loss of interest.

The quality and texture of the composite flour produced by Soroti Sweet Potato Producers and Processors Association (SOSPPA), an association of 600

**Table 4.** Summary of economic information on selected innovations associated with PMCA, 2007 and 2011

Innovation	Innovator	2007				2011			
		Cost per unit (USh)	Selling price per unit (USh)	Sales per month	Gross margin (%)	Cost per unit (USh)	Selling price per unit (USh)	Sales per month	Gross margin (%)
Improved packaging and branding of potato crisps for high-end market	TomCris	380	600	1000 packs	37	600	800	1200 packs	25
New sweet potato variety (Naspot 1) for local market	Sulma Foods	500	700	120 kg	28	1100	1350	2 t	18
New sweet potato variety (Naspot 1) for export	Sulma Foods	1000	1400	300– 400 kg	28	1625	2125	2.5–3.0 t	23
Orange-fleshed sweet potato (OFSP) flour for local market	SOSPPA	2400	4000	300 kg	40	3000	5000	400 kg	40
Sliced and dried hot pepper for export	Sulma Foods	-	-	-	-	25,000	37,500	300 kg	33
Vegetable appetizer	TomCris	700	1000	240 bottles	30	1000	1500	960 bottles	50

sweet potato farmers in Eastern Uganda, has been improved with support from several R&D agencies. This was in response to observations made about the coarseness of the flour by potential consumers during a focus group discussion held in phase 3. The association bought a grinding mill, which also contributed to improving the quality of the flour. Previously, the SOSPPA packaged OFSP flour in a transparent plastic bag, which led to rapid degradation of the beta carotene and other quality attributes of the flour. Customers were also skeptical about the quality of the packaging material and the flour and were reluctant to buy the product. During the PMCA, a branded paper bag with a plastic lining was developed with the aim of preserving the nutritional value and improving the marketability of the flour. As a result, the price of flour immediately rose from US\$3000 per kilogram to US\$4000 per kilogram in 2007 and further increased to US\$5000 per kilogram in 2011. The volume of sales has increased from 300 kg per month in 2007 to 400 kg per month in 2011.

The gross margin for this product has not changed with the improved packaging due to increased costs incurred towards improving quality of the flour (Tables 3 and 4). However, since sales have increased by one-third, more income has been generated by the farmers' association. Members of the association believe that this product can drive future efforts to add value to their sweet potatoes, and they are seeking assistance to further improve the flour. In addition, due to the collaboration initiated during the PMCA, SOSPPA members signed a joint agreement in 2009 to sell 10,000 bags of OFSP vines to FAO-supported groups in Karamoja, located in the northeast.

Another innovation was the establishment of a kiosk that was branded and placed in a busy market with the aim of promoting and marketing OFSP products. The lead farmer of one of the farmer groups revealed that the kiosk has not only improved their marketing skills but has also exposed them to stakeholders from within and outside Uganda, expanding their trading horizon. The group that now privately manages the kiosk also revealed that it also serves as a one-stop center for promoting their services, which include training and supply of sweet potato vines.

The sweet potato group also introduced Naspot 1, a white-fleshed variety in Uchumi, a Kenyan supermarket chain that maintains an outlet in Uganda. This variety was selected because of its shape, size, skin color, and fairly good shelf life, which appealed to high-end consumers. The volumes of this variety sold by Sulma Foods in supermarkets have grown from 200 kg per week at introduction to 3 MT per month at the time of the study. The number of supermarket chains supplied has also risen from one to three. Sulma Foods has also increased exports of Naspot 1 to the Middle East from 200 kg to 5 MT per month.

*Innovations in vegetable market chains.* The vegetable group developed new products, including pickles, appetizers, and sauces. These innovations were borne out of the need to reduce the high post-harvest losses and also to respond to market opportunities that were identified during phases 1 and 2 of the PMCA. Currently, the pickle and tomato sauce are not in the market. There was low demand for pickle as it was mainly consumed by the expatriate community in Uganda. The tomato sauce processor, on the other hand, failed to obtain funding required for certifying the product with the Uganda National Bureau of Standards (UNBS).

The two vegetable appetizers were new products of the PMCA: one was produced by TomCris and the other by Sulma Foods. Appetizers are concoctions made of pepper, oil, spices, and tomatoes that are applied directly to cooked food to improve flavor and taste. They are very popular in boarding schools as students use them to spice school food to improve its palatability. After the PMCA, the volume manufactured by Sulma Foods has been limited due to the scarcity of glass jars. TomCris's appetizer is packed in branded plastic bottles and is still available in the market. In 2007 when the product was launched, the production cost per bottle was USh700, and the sales price was USh1000. TomCris was able to sell 10 cartons (each carton contains 24 bottles) of appetizer per month, with a profit of 42%. In 2011, sales stood at 40 cartons per month where each bottle cost USh1000 to produce and was sold at USh1500. TomCris, who originally specialized in crisp and snack processing, has opened up a vegetarian restaurant, which has greatly improved sales and promotion of the appetizer.

The PMCA also triggered a number of innovations that emerged after completion of the PMCA application (Table 2). SulmaFoods, for example, has developed a new product, sliced and dried hot pepper, which is being exported to the Middle East. The proprietor reported that this product was developed through continuously obtaining information on customers' desires and striving to address their changing needs. Together with his staff, some of whom were members of the vegetable group, he has ventured into new product and brand development in order to expand and diversify the markets for Sulma products. This is greatly enhanced by innovative labels produced with the help of the graphic artist who supported the groups during the PMCA. The company now includes fresh fruits and vegetables, solar-dried fruits and vegetables, and honey as part of its product portfolio. For the past four years, Sulma Foods has sold 60 kg of fresh hot pepper per day in attractive packages to a number of supermarkets. Each kilogram of fresh hot pepper sells at USh10,000. Sulma Foods also exports 2 to 3 MT of fresh pepper and 300 kg of sliced and dried pepper per month to Dubai in the United Arab Emirates.

### Changes in knowledge, attitudes, and skills

For most of the market chain actors interviewed, the most important outcome of the PMCA was the interactions and networks that evolved and have been sustained. These networks have proven to be very valuable, especially in terms of business strategy development, information sharing, and learning. Processors from the potato group, for example, revealed that they regularly share information on inputs sources, pricing of finished products, and new market outlets. The information shared assists them in securing raw materials at reasonable prices, especially in times of scarcity, and in securing new markets. Sulma Foods also reported that in order to overcome the challenge of obtaining glass jars for the appetizers, it pooled resources with other traders to import a container load of the jars. This would not have been possible without the prior network established through the PMCA.

Rapid market research tools are highly appreciated and are continuously used in testing new products, labels, and brands. Before the PMCA, most of the actors and facilitators had not used these tools before. The practical nature of the tools, the ease of application, and the information generated were found to be highly relevant for their businesses. The big exporters (i.e., Sulma Foods, Flona Commodities, and Jaksons) also reported that the knowledge and exposure gained in the PMCA gives them greater confidence to approach government institutions and policy makers for information and technical assistance. They have been invited to join study tours to the Kenya horticultural industry and are now developing strategies to improve handling, packaging, and shelf life of Ugandan produce. With the aid of former PMCA facilitators, Sulma Foods submitted a proposal that was funded by the aBi Trust, a multidonor entity that supports private sector agribusiness development in Uganda.

Six PMCA facilitators reported having improved their knowledge and skills for R&D work. They also appreciated the concepts and tools associated with the PMCA methodology. The *PMCA User Guide* and other resource materials have continued to be an important resource especially in the aspects of market research and for facilitating multistakeholder platforms. The materials have not only been useful for the individuals who received them but have also been shared with other interested parties within and outside their organizations. As noted by Almond and Kisauzi (2005), “good capacity development recognizes that it is essentially an assisted self-learning exercise that accepts that uncertainties exist, and incorporates learning into the research process.”

The PMCA facilitators have become skilled “innovation brokers,” performing the following types of function:

- *Demand articulation*: Articulating innovation needs and corresponding demands in terms of technology, knowledge, funding, and policy



- *Network formation*: Facilitation of linkages between relevant actors (i.e., scanning, scoping, filtering, and matchmaking of possible cooperation partners)
- *Innovation process management*: Enhancing alignment and learning of the multi-actor network, which involves facilitating learning and cooperation in the innovation process (Klerkx and Leeuwis, 2008; Klerkx et al., 2009)

### **Inclusion, Empowerment, and Well-being**

One of the things we learned during our work with the PMCA is how difficult it is to engage smallholder farmers in joint innovation processes with food processors and market agents. This is partly because of the geographic dispersion of small farmers in rural areas; in contrast, food processor and market agents are usually based in urban areas. Farmers are also generally less educated and more resource constrained. As a result, they may feel discriminated against and may not feel comfortable interacting with market agents. Due to differing life experiences and sometimes differing languages, farmers may not communicate effectively with market agents.

For these reasons, as well as the PMCA's focus on generating innovations in the market chain and not in production systems, small farmers are not as active as market agents in participating in the PMCA exercise. A recent study of experience with the PMCA in Indonesia shows how farmer organization and provision of business development services can help small farmers participate more fully in market chain development exercises and benefit more from them (Horton et al., 2013).

Nevertheless, the smallholder farmers that did participate often reaped significant benefits that created a positive effect on their well-being. For example, the women who manage the market kiosk have received and serviced large orders for vines from developmental agencies and other institutional buyers. Inclusion in such lucrative businesses was previously not possible as they were hindered by a host of factors, such as access to reliable buyers, distant markets, and resources to enable them to finance transaction costs (e.g., bulking) that are often a prerequisite in such deals. Their participation in the PMCA exposed them to institutional buyers, and with support from the PMCA facilitators and other chain supporters, they were able to accomplish several transactions, boosting their business and income. This has enabled some of the women to increase the acreage under OFSP by 40% or more. The chairperson, for example, had increased the area she planted to sweet potato from 0.1 to 2.0 ha. Many women have acquired additional household belongings and assets and now make more significant contributions to their families' incomes. For most, the ability to contribute towards their children's scholastic needs is a source of pride, as they value the importance of education for their children. As a result, the women attested that improved income has

resulted in increased harmony in the household, and their contribution towards the family's well-being is valued more now than before. Farmers in the SOSPPA also report that OFSP vines and processed products have greatly improved their income and family health. Women note that men are now interested in OFSP production and also assist them in reaching distant markets, which are not easily accessible on foot. Access to better markets has increased income obtained from the crop and the well-being of women who depend heavily on it for their livelihood. Sweet potato production is now more highly regarded than in the past when it was considered "just a woman's crop" and allocated minimal resources.

### **Institutionalizing the Use of the PMCA**

After completing the PMCA exercise in late 2007, PMCA core team members have used various ways to promote the use of the approach, such as developing concept notes, funding proposals, conducting trainings, facilitating PMCA processes, and supporting market chain actors in various ways.

A number of institutions were introduced to the PMCA by the first group of facilitators. Some institutions were introduced to the approach by their staff who were part of the facilitating team; others were introduced through the efforts of the PMCA champions. These champions were also part of the first group of facilitators but went an extra mile to interest other organizations in applying the PMCA through proposals and face-to-face dialogue. After hearing about the PMCA from other sources, some organizations approached the facilitators directly.

The PMCA had been institutionalized in the Mukono Zonal Agricultural Research and Development Institute (MUZARDI) through the efforts of the director, one of the first adopters of the approach. From an early stage, the director made sure that most of the staff got involved in the first application on sweet potato. The institution had since developed a number of projects that used the PMCA and continued to encourage its staff to champion the use of the PMCA in a number of value chains, thereby attaining the status of PMCA experts. Currently, MUZARDI is implementing two PMCA projects. One of which is a collaborative competitive grant project on improving the pineapple market chain funded by the National Agricultural Research Organization (NARO). Activities for phases 1 and 2 have almost been completed in four regions of the country. The project had benefited from the participation of the Uganda Industrial Research Institute (UIRI), the dynamism and enthusiasm of processors, and exposure visit of the proponents to the Food Technology and Business Incubation Center (FTBIC) at Makerere University. The presence of these actors had greatly increased the interest and willingness of people to work together. The exposure visit resulted in innovative ideas for capitalizing on the identified market opportunities (Magala et al., 2010). After exposure to the incubation center, one farmer from Bushenyi submitted a funding proposal

to the National Agricultural Advisory Services (NAADS) on pineapple processing. Another processor also submitted a concept note to aBi Trust for branding his products. Both had been approved. These two initiatives have improved access to good markets for over 100 pineapple growers. Phase 3 is expected to commence soon.

The second project entitled “Increasing the Capacity of Smallholder Farmers to Produce and Market Vegetable Crops in Uganda and the Democratic Republic of the Congo” is a multi-institutional project led by the University of California, Davis (UC Davis) and funded under the Horticulture Collaborative Research Support Program (HortCRSP) initiative. The key partners include the UC Davis, two local universities, the Mukono District local government, and the Rural Agency for Sustainable Development (RASD). The research project aims to assess whether integrating the PMCA and farmer field school (FFS) approaches is better than using each approach alone. MUZARDI facilitated the PMCA component of the project, while an MSc student from Makerere University attached to the project is studying and documenting PMCA and FFS processes and outcomes. Three university students are also studying the PMCA process as special projects and could later become PMCA facilitators. Currently, phase 2 activities are nearing completion.

The A2N-Uganda has also implemented two projects using the PMCA approach. The first project, implemented in Eastern Uganda, focused on improving the cassava value chain. The second and bigger three-year project entitled “Poverty Eradication through the Participatory Market Chain Approach” was implemented in selected districts in Eastern and Western Uganda and focused on the potato, cassava, and banana chains, among others. Both projects were funded by Catholic Organisation for Relief and Development Aid (CORDAID).

In 2009, the Participatory Ecological Land Use Management (PELUM) regional secretariat supported a regional PMCA training for 20 staff from Uganda, Kenya, Tanzania, and Rwanda. PELUM got to know about the PMCA through the regional head, who had previously worked with the A2N-Uganda. Consequently, the PMCA was applied on the grain amaranth chain in Kenya and the maize chain in Uganda. Activities in Kenya ended after completion of phase 1 due to funding constraints, while activities in Uganda continued and phase 2 is nearing completion.

In 2010, FAO supported a seven-day PMCA training course for 35 master FFS trainers as part of a larger four-month training course. FAO learned about the PMCA through a concept note submitted by a group of facilitators. The trainees were district production officers from Northern and Eastern Uganda. As a result of the training, one master FFS facilitator was able to conduct phase 1 on the mango and cassava chains in West Nile, Uganda. This is a case of an early adopter who has accomplished a lot in promoting and institutionalizing the PMCA in his organization.

The former PMCA coordinator in Uganda has worked with the Royal Tropical Institute (KIT) to incorporate the PMCA into a curriculum for preparing agricultural innovation coaches (AI coaches). KIT is promoting AI coaching through partnerships and training. Concept notes, papers, and publications are in the pipeline.

The CIP, in collaboration with other partners, has recently launched a new project entitled “Scaling up Technologies in OFSP using the Agricultural Innovation System (AIS) to Address Food and Nutrition Security in Eastern and Central Africa.” The 18-month project, funded by ASARECA and the World Bank, is using the PMCA to develop and improve the OFSP value chains in project areas in Kenya, Uganda, and Tanzania.

## Lessons Learned

During our work with the PMCA and subsequent studies, we have learned several lessons that may be useful for improving future PMCA applications. The lessons relate to five broad themes: PMCA design and methods, planning and funding strategies, PMCA implementation and facilitation, follow-up after PMCA, and the importance of PMCA champions.

### Design and Methods

1. It would be useful to collect more quantitative information on the economic value generated along the chain during phase 1. The *PMCA User Guide* calls for a qualitative diagnostic study. However, our experience indicates that quantitative information on gross margins and value added at each point in the chain would be valuable for analyzing and understanding existing chain operations and also for quickly identifying lead actors in the chain.
2. Effort should be made to identify critical support functions in the chain and to engage relevant service providers in the PMCA activities as early as possible.
3. Gender and equity issues merit special attention. Too often, women are seen as the doers and men as the financiers in agricultural enterprises. Women and other marginalized groups need to be identified and encouraged to participate throughout the PMCA exercise.

### Planning and Funding Strategies

1. South-south knowledge sharing is feasible, motivational, and can help avoid repeating work that has already been done and mistakes that have

been made elsewhere. The study visits to the Andes were crucial for kick-starting the PMCA process in Uganda, and marketing approaches that were used in the Andes were adopted and successfully applied in Uganda.

2. Obtaining funding for the PMCA applications can be challenging, leading to partial application of the approach or a loss of momentum. This can impact negatively on social relations that are necessary to develop trust among partners, which is a prerequisite for joint innovation. Where donor funding is scarce, future applications could benefit from alternative funding approaches, such as linking up with social investors.

### **Implementation and Facilitation**

1. PMCA facilitators need to influence the composition of thematic groups and manage interactions to foster open communication and innovation. Communication may be easier among participants with similar backgrounds and experiences (such as a group of producers or traders). But innovation is produced through the interaction of market chain actors with diverse interests. For this reason, group composition should be diverse, and facilitators need to work hard to promote communication among the members. This will often require translation of ideas across cultural divides and mediation of different interests and points of view.
2. Farmer groups may need support to engage effectively with other market chain actors. Smallholder farmers often find it difficult to meet the quality or other requirements of supermarkets, exporters, or other demanding buyers. Technical assistance, business training, or organizational support may be needed for them to organize and to develop and implement workable production and marketing plans.
3. New groups that wish to implement the PMCA in new contexts can benefit from mentoring support from individuals who have already used the approach. This was evident from PELUM facilitators, who were very enthusiastic to apply the PMCA after the training but had great difficulty implementing it. The Ugandan application on maize made good progress due to support from local PMCA facilitators, as compared to the Kenyan one. This implies the need to allocate a budget for mentoring support, especially in new contexts.

### **Follow-up**

1. Follow-up support to innovators after the PMCA exercise formally ends can be very beneficial. Many innovators felt that the exercise ended too soon, especially for the consolidation of institutional innovations, which needed time to become well established. Mentoring and coaching for start-up businesses (i.e., support to establish management systems, marketing strategies, and good business practices) would also be helpful. Ideally, the PMCA is implemented as a central component of a broader market chain development program that also includes interventions aimed at strengthening farmer organization, training in business skills, and provision of business development services (Horton et al., 2013).

### **PMCA Champions**

1. Three types of champion are needed to ensure the success of a PMCA process. The first type is a high-level decision maker who can raise funds for the PMCA and ensure support for its application in R&D organizations. In our case, these included officials within the DFID, NARO, and other local R&D organizations. The second type is the facilitator who can create a dynamic and productive group process. Our coordinators and commodity group leaders fell into this category. The third type is a champion from within the market chain, such as Sulma Foods and TomCris. These early adopters drove innovation processes forward during and after the PMCA exercise. Without them, no innovation or market chain development would have occurred.

### **Conclusions and Prospects for Improvement**

Despite the many challenges faced, the PMCA was successfully applied in Uganda. This could be in part attributed to the commitment of the coordinators, facilitators, and interested stakeholders who refused to give up despite facing funding constraints. The facilitators, in particular, exhibited a “service attitude” and a desire to see the results of the process to the extent that they continuously supported the actors long after the PMCA process formally ended.

Among the market chain actors, the ability to innovate and change their products in line with changing market conditions warrants special mention. The market actors contacted for this study emphasize that such skills are invaluable, as innovations are constantly needed if one is to survive in the market.

For the R&D institutions that have continued to experiment and work with the PMCA, studies have been initiated that should help refine and adapt the approach to local contexts. A cadre of facilitators is slowly building up in these institutions, which are supported by the initial PMCA facilitators who are now viewed as experts. In this way, capacity is being developed to expand the application of the PMCA within Uganda and elsewhere in the region.

In the quest for sustainable rural development, we believe the PMCA can play an important role in the development of value chains for the betterment of smallholder farmers in Uganda and elsewhere in East Africa. We would like to conclude by offering four suggestions for improving future applications of the PMCA.

1. Provide business development support after the application of the PMCA. Many of those consulted for this study felt that the process had ended prematurely, negatively affecting the sustainability of some innovations. While the role of the facilitators is designed to diminish over time, there seems to be a need for technical backstopping for a longer period.
2. Provide more support for smallholder farmers to develop the skills and resources needed to respond effectively to changing market demands. There are important differences within market chains with respect to the business skills and resources possessed by different actors, and smallholder farmers are generally the weakest in this respect. Support for farmer organization and business development can be useful in this regard.
3. Provide seed money to support the commercial development of innovations. There is a need to identify critical areas for support that can promote and sustain innovation processes. Although the PMCA generally seeks to stimulate innovation by promoting interaction and collective action and generally does not fund capital investments, such support is at times essential to spur innovations to upgrade the chain.
4. Provide long-term support for innovation brokers. Innovation brokers can play important roles in facilitating innovation processes over time, not just within the scope of projects with short time horizons. Support could be solicited from the public sector or from social investors and development finance agencies that wish to promote innovation processes that contribute to broader goals of food security, poverty reduction, and protection of the natural environment.



## Notes

1. These people had been involved in PMCA training and workshops in Uganda and with the visit of Ugandans to Peru and Bolivia in order to learn about the PMCA and its outcomes in these countries.
2. Conversion rates: US\$1 = US\$0.0006 (2007); US\$1 = US\$0.0004 (2011) (<http://www.oanda.com>).

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