

The PMCA and potato market chain innovation in Peru

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Potato is the main crop grown in Peru's highlands, where it is an especially important source of both food and cash income for small farmers. More than 3,000 varieties of native potatoes are cultivated, mainly above 3,500 meters above sea level. From 2001 to 2010 more than 20 public, private, and non-governmental organizations (NGO) worked with Papa Andina Regional Initiative and the Project for Potato Innovation and Competitiveness in Peru (INCOPA) to promote innovations in native potato production and marketing that would benefit small farmers and make the market chain more competitive. To this end, an applied research and development (R&D) approach known as the Participatory Market Chain Approach (PMCA) was developed. To capitalize on the biodiversity existing with native potatoes and their culinary, nutritional, and cultural attributes, INCOPA worked to link smallholder cultivators of native potatoes with researchers, development professionals, and a range of potato market chain actors. The PMCA was used to identify business opportunities, foster collaboration with actors along the market chain, and generate innovations to enhance competitiveness. The PMCA was complemented with efforts to promote innovation platforms, raise public awareness of the virtues of native potatoes, and support evidence-based policy making. This mix of strategies triggered innovation processes that have continued until today. This Innovation Brief outlines some of the project's results and implications, and areas needing further attention.



Introduction

Potato is one of the most important crops in Peru, both economically and socially. Each year, around a million families cultivate potatoes on nearly 300,000 hectares of land, harvesting nearly 4 million tons of potatoes (Horton & Samanamud, 2013: Annex Table 2). Potato is the main crop for most highland farmers, especially small producers for whom it is a strategic source of food and cash income. Potato cultivation employs more people and generates more economic value per hectare than any other food crop. The diversity of native potatoes and their uses also plays an important role in ancestral customs in highland areas.

Despite the importance of potatoes in Peru's highlands, in the 1970s and 1980s, potato consumption declined, partly because of the potato's image as a "starchy staple" and "poor man's food." Consumption of native potatoes fell disproportionately, due in part to rural-urban migration and insecurity in the highlands.



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◆ Application of the PMCA in Peru

In this context, the INCOPA Project was formulated to improve the competitiveness of Peru's potato market chain, with emphasis on the native potatoes grown by small highland farmers. This objective was pursued through innovation platforms involving private and public actors and NGOs; knowledge sharing, public awareness, and policy influence; and capacity development, to strengthen the contributions of R&D organizations to innovation on farms and in market chains.

Implemented in three phases from 2001 to 2010, INCOPA was hosted by the International Potato Center (CIP) and was part of the Papa Andina Regional Initiative. It received generous financial support from the Swiss Agency for Development and Cooperation (SDC). Over time, it engaged the participation of more than 20 private firms, public agencies, and NGOs, and of some 2,500 smallholder potato-growing families in the Peruvian highlands.

Central to INCOPA's work was development and application of the PMCA – a flexible innovation approach that brings together smallholder farmers, market agents, researchers, and other service providers in a structured process, to identify and exploit potential business opportunities that benefit farmers as well as others who participate in the market chain.

As detailed in the *PMCA User Guide* (Bernet, Thiele & Zschocke, 2006), the approach involves a sequence of activities usually implemented over 12-18 months. Initially, R&D professionals play key roles facilitating the process. Later on, as market chain actors become more actively engaged, R&D professionals should support rather than lead the process.

The PMCA has three phases. During phase 1, R&D professionals get to know the market chain, the main actors, their interests and challenges. Phase 2 aims to generate and assess alternatives for improving marketing and involves group work by market chain actors and service providers. In phase 3, development work begins on promising commercial innovations. Early successes may encourage individuals and groups to continue interacting and innovating in the future.

Two cycles of the PMCA were implemented in Peru. The first one focused on innovations with improved potato varieties. Based on a market study that indicated the existence of a latent demand for native potatoes, the second cycle focused on developing new products and markets based on native varieties.¹

In both cycles, participants included researchers, farmers, ministry officials, market information specialists, food technologists,

1 The term “improved varieties” refers to the products of formal potato breeding programs; they have been deliberately bred for particular traits, such as high yield and resistance to pests or diseases. In contrast, “native varieties” are landraces or local potato varieties that have developed largely by natural processes, by adaptation to the natural and cultural environment in which they grow.

potato transporters and wholesalers, food processors, managers of supermarkets, and chefs. This diversity of participants was a radical departure from earlier R&D efforts that had involved only researchers, extension officers, and farmers. The diversity of participants and their interests called for good facilitation of group work. Facilitators needed to know the local culture and political sensitivities and be able to work well with people from the public and private sectors and NGOs. Many researchers felt – and some still do – that working with service providers and market agents distracts research from its proper focus on increasing food supplies by solving production problems. However, the “new actors” brought fresh perspectives, ideas, and energy, helping trigger innovation processes that have continued over years, sometimes with far-reaching unanticipated results.

It is important to realize that the PMCA was not implemented in isolation. One of the basic assumptions of INCOPA was that a multi-pronged approach would be needed to significantly improve the competitiveness of the potato sector and generate meaningful benefits for small producers and market agents. Without complementary work on policies, public awareness, and capacity development, the PMCA was not expected to generate substantial and long-lasting benefits on its own. For this reason, the PMCA was supported and complemented by three other activities:

- Development of multi-sector platforms
- Public awareness and policy advocacy
- Encouragement of broad participation in innovation processes.

Multi-sector platforms. During implementation of the two PMCA cycles, the nucleus of an effective working group emerged, with members from different public agencies, private companies, and NGOs. INCOPA supported the consolidation and expansion of this informal multi-sector platform to support knowledge sharing, public awareness and policy advocacy. One of the first activities was to organize Peru's National Potato Day, celebrated since 2005 on May 30.² To organize this event, the group took the form of a “Multi-sectorial Commission for National Potato Day”. Initially hosted at CIP, celebrations are now held at other venues in Lima and other parts of the country. At the first celebration, the idea emerged for Peru to propose that the Food and Agriculture Organization of the United Nations declare an “International Year of the Potato”. Peru's Ministry of Agriculture mobilized the commission to prepare a proposal that led to the declaration of 2008 as the International Year of the Potato.³ Since then, sub-groups have led or supported several other initiatives to improve the image and competitiveness of the potato sector, including:

- Preparation of technical norms for fresh and processed potatoes and for freeze-dried native potatoes (tunta)
- Potato sector studies
- Development of a strategic vision for Peru's potato sector (Devaux *et al.*, 2010)

2 See: <http://www.deperu.com/calendario/959/dia-nacional-de-la-papa>.

3 <http://www.fao.org/potato-2008>.

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- Development of strategies for improving potato seed systems

Members of the commission have also played active roles in a *Learning Alliance* that was established a decade ago as a mechanism for exchanging information and lessons on value chain development among public, private, and NGOs (Ordinola, 2014). Over time, the alliance has broadened its work in support of policy discussions and decision-making related to such topics as private-public partnerships, models for effective farmer organization, and agricultural innovation systems.

A formal organization also emerged from the Peruvian PMCA exercise: CAPAC, (short for “Quality Agricultural Productive Chains in Peru”).⁴ The goals of CAPAC are to:

- promote small-scale Andean farming by enhancing the competitiveness of the potato sector;
- stimulate employment and income growth for individuals involved in the potato market chain;
- stimulate potato consumption by raising the quality of potatoes supplied to the market and disseminating information on the cultural, economic, and nutritional value of potatoes; and
- contribute to the formulation and implementation of policies that support pro-poor development of the potato sector.



CAPAC’s work has concentrated on helping native potato producers in the highland Apurimac Region to link more effectively with potato processors and supermarkets.

CAPAC leads an “Andean Potato Initiative” in which companies, NGOs, producer organizations,

and chefs work together to improve the marketing and consumption of native potatoes. The initiative works to:

- highlight the value of native potatoes for producers, consumers, and the society as a whole;
- raise awareness among consumers and business people about the benefits of corporate social responsibility (CSR),
- promote and publicize the CSR efforts involving highland potatoes and potato-producing communities; and
- support producers organizations’ efforts to develop viable and sustainable marketing initiatives for their potatoes.

The initiative serves as a source of information and professional services for business people and companies, producers organizations, and NGOs who wish to expand the use of native potatoes in ways that benefit all members of the market chain, including small highland producers.

⁴ In Spanish, CAPAC Peru is the acronym for “Cadenas Productivas Agrícolas de Calidad en el Perú”.



These activities have contributed positively to the image of the multi-sectorial commission as a platform for strengthening the competitiveness of Peru’s potato sector and contributing to debates on wider policy issues.

Public awareness and policy advocacy. INCOPIA has prioritized activities in the spheres of knowledge sharing, public awareness and policy influence. Public awareness was seen as a means to promote potato consumption directly and also to influence policies. Policy advocacy sought to influence policy formulation and implementation in ways that would contribute to the competitiveness of the potato sector.

Information on the nutritional, economic, and cultural value of potatoes and on how small farmers can benefit from value chain innovation has been presented in various forms, including:

- technical publications issued by the project;
- popular articles in Peruvian newspapers;
- information on local TV programs;
- specialized Peruvian publications on agriculture, nutrition, and cuisine;
- presentations on the value of potatoes as a national resource and on the strategy being pursued to consolidate the competitiveness of the sector, at public events;
- information campaigns, such as those associated with National Potato Day and the International Year of the Potato; and
- information provided to support the work of opinion leaders and sector champions in the country.

On the policy front, public agencies have been actively encouraged to support the modernization of marketing processes, for example by formulating technical norms for marketing potatoes. The image of native potatoes has been

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promoted nationally and internationally through Peru's National Potato Day and the International Year of the Potato, as well as a potato promotion campaign known as *Papea Peru*. Representatives of the private and public sectors were involved in formulating and disseminating a strategic vision, to aid in the long-term development of the potato sector (Devaux *et al.*, 2010).

Encouraging larger market actors to innovate. The PMCA generally attracts small-scale market agents and farmers. In the Peruvian exercises, some large market actors participated in the

initial events, but dropped out, because they saw little short-term benefits from participating. As a result, all the early innovations involved small processors. INCOPA and its network of collaborators have both supported the initiatives of small-scale market agents and encouraged larger market actors to develop new potato-based products and new institutional arrangements for organizing the supply of potatoes for producing them. Their involvement, encouraged by the promising results they observed with the small companies, has led to the creation of a number of new potato-based products, as discussed in the next section.



Results

The PMCA and the complementary strategies employed have triggered commercial, institutional, and technological innovation processes that have had far reaching consequences for participating farm families and for the potato sector as a whole.

Commercial innovations

During the initial applications of the PMCA, several new native-potato-based products were developed, including:

- *Mi papa* ("My Potato"), Peru's first brand of selected fresh potatoes, supplied to Lima's wholesale market in 50 kg bags.
- Packaged, high-quality traditionally freeze-dried native potatoes (*tunta*) sold under the brand "Los Aymaras" locally, and exported to Bolivia.
- *Puré Andino* ("Andean Mashed Potato"), which was exported.
- *T'ikapapa*, Peru's first brand of high-quality fresh potatoes sold in Lima supermarkets. Sold as gourmet fresh potatoes, with a mix of different varieties, T'ikapapa introduced native potatoes to Peru's leading supermarket – Wong.
- *Papy Boom*, packaged yellow native potato chips aimed intended to be marketed for children in lower income families.

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- *Jalca Chips*, the first brand of colored native potato chips sold in Peru.

Jalca Chips, introduced in duty free shops in Lima's international airport was the first market innovation which opened the way for native potatoes into high value markets. They were subsequently

replaced in the market by other brands of native potato chips of superior quality, including ones produced by small provincial companies and others produced by multinational giants such as Fritolays and Gloria.

The proliferation of brands over time is illustrated in Figure 1.

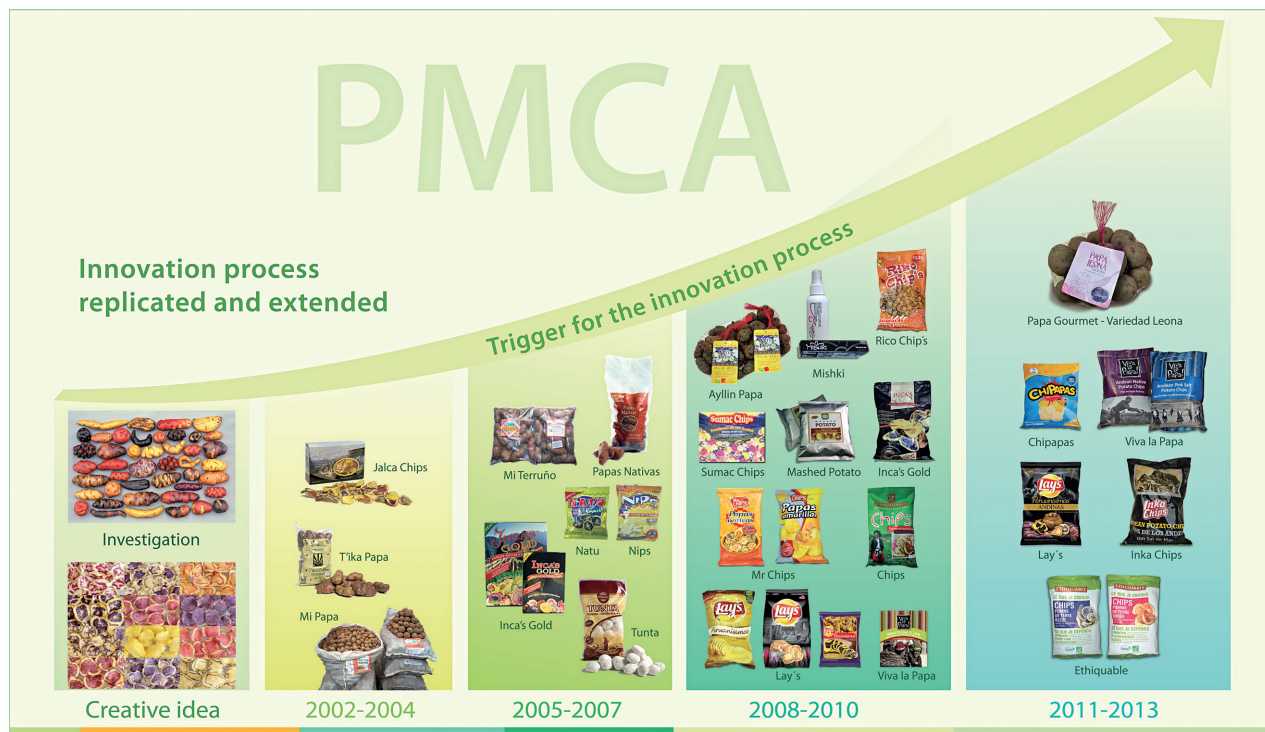


Figure 1. The PMCA as a trigger for new potato product development in Peru

Institutional innovations

Institutional innovation refers to changes in the norms, regulations, and organizations that enable and constrain behaviors and interactions that influence market chain development. The PMCA triggered some institutional innovations that improved the coordination of activities needed to expand the supply of high-quality potatoes to the market. Examples include:

- *CAPAC Peru* (Quality Agricultural Productive Chains in Peru), which emerged as an institutional innovation from the PMCA exercise. Originally established as an association to promote "Mi Papa" it has continued to support the native potato value chain until now.
- *Iniciativa Papas Andinas* (Andean Potato Initiative), an alliance of companies, NGOs, producers organizations and chefs that recognizes the value of Andean potatoes for consumers, producers and other market chain actors and promotes development of the sector through application of CSR principles.
- *Alianza Institucional de la Tunta* (Institutional Tunta Alliance), which supports improvements in the quality and marketing of native freeze-dried native potatoes.

- *La Alianza de Aprendizaje* (The Learning Alliance), which was originally set up for NGOs and other interested parties to share knowledge and draw lessons for improving their work to support value chain development. Over time, its work has expanded to cover other topics, such as farmer organization and public-private partnership. The alliance has coordinated the preparation of studies suggested by its own members as well as ones requested by government officials.
- Creation of quality standards for potatoes in Lima's wholesale market, marketed with the "Mi Papa" brand.

Institutional innovations aimed at leveraging political and broader public support for development of the native potato chain have included:

- Establishment of the multi-sectorial commission for organizing Peru's National Potato Day
- Celebration of National Potato Day each year since 2005
- Development of technical norms for *tunta*
- Drafting a national wholesale potato trade law in 2008
- Inclusion of native potatoes in Peru's registry of national potato varieties

Technological innovations

Technological innovations are changes in production practices that increase the efficiency or quality of production. Experience with the PMCA shows that when farmers can count on a profitable market for their potatoes, they are eager to improve their cultural practices and invest in new technologies. Nevertheless, Andean farmers, particularly small farmers in isolated regions, often lack good sources of technical information and support to upgrade their practices. In this context, INCOPA has worked with public research entities, private firms, and NGOs to more effectively meet the technical needs of farmers who wish to respond to new market opportunities for their potatoes. Examples of improvements include the following:

- Selection of native varieties with appropriate attributes for marketing or processing
- Characterization of the processing qualities of native potatoes
- Promotion of sprout inhibitors to increase the shelf life of native potatoes
- Improvements in pest and disease control
- Promotion of seed production techniques (including “positive selection”) that raise yields and product quality while protecting the environment

Sector-level changes

In the context of recent improvements in Peru’s information and transportation networks and rapid growth of agriculture and the economy as a whole (Webb, 2012), the work stimulated by INCOPA and the associated network of private and public partners has contributed to important changes in the potato sector. During the last decade, potato consumption in Peru has increased from 65 to 85 kilograms per person per year. In Latin America, which has experienced stable or declining potato consumption, the increase in Peru’s potato consumption represents one of the most notable events in the region’s potato sector in the past 50 years (Scott, 2011). Over the last decade, native potato production has increased by about one-third in Peru. But even with this increased production, farm-gate prices for native potatoes have increased by more than 50%, due to significant increases in consumer demand. As a result of increased sales and higher prices, the value of native potatoes sold by farmers had risen by 150%.

Farm-level changes

A village-level study (Bucheli *et al.*, 2007) shows that farm families in Cayna (Huánuco Region) who participated in the INCOPA Project increased their yields of yellow potatoes from 10 to 14 metric tons/ha and obtained a price premium of 20% due to improved product quality and better marketing practices. As a result, average family income from sales of yellow potatoes increased from US\$ 721 to US\$ 2,058. In Andahuaylas (Apurímac Region), producers increased their yields from 9 to 15 metric

tons/ha, and received a price premium of 26% over that received by farmers in the control group (Maldonado *et al.*, 2011). Beyond these project sites, recent increases in urban demand for potatoes – particularly native potatoes – coupled with significant improvements in market information – via cell phones – and farm-to-market roads have stimulated increases in production and productivity throughout the highlands.



Traditionally, native potatoes have been grown for on-farm consumption and they were sold only occasionally, when cash was urgently needed. Expanding urban demand for native potatoes has created new opportunities for small highland farmers to expand their potato production, diversify their market relations, and generate more cash income. In responding to these new opportunities, farmers need to develop their marketing skills and improve their production and post-harvest practices to meet more demanding quality

standards for their produce. This remains an important challenge that needs to be addressed when PMCA cycle is completed to ensure the sustainability of the intervention.

◆ Lessons

The Peruvian experience presented here highlights of some important lessons for applied R&D efforts.

The PMCA triggered innovation processes that led to significant impacts, but it did not produce the impacts on its own. The recent expansion of transportation and communications in Peru's highlands, favorable economic policies, and the boom in Peruvian cuisine have all played important roles in improving farmers' welfare. A mix of complementary measures implemented in a favorable context, led to the changes that have been observed.

Benefits of the PMCA have emerged over time, often as a result of creative imitations. There were relatively few direct beneficiaries during implementation of the PMCA. But over time, the number of indirect beneficiaries has grown exponentially, as more people became aware of the new products developed and as more began to innovate on their own – often copying the original innovations or improving on them in creative ways. As a result of the proliferation of innovations sparked by the PMCA, market chain actors, including small farmers, benefited from the expansion of the production and use of potatoes – particularly native potatoes (See Innovation Brief 2).

Long-term financial and institutional support, provided in this case by SDC and CIP, was essential for achieving significant results. Capacity development takes time and innovations emerge over time in unpredictable ways. Such processes can benefit from external support over a considerable period of time in this case over more than a decade. In most cases, it is unlikely that a 2- or 3-year development project could provide the support needed to build innovation capacity in such a way as to produce significant and enduring results.

Modern science can play a useful role in expanding the utilization of ancient crops. It is generally thought that the main contribution of international agricultural research centers to agricultural development is through the generation of new crop varieties. The work reported on in this Brief illustrates how CIP was able to contribute to greater utilization of native crop varieties, through a program of complementary interventions including not only research but public awareness, policy influence, and capacity building. It

Experience shows that it is usually best done in collaboration with NGOs as well as private firms that wish to strengthening their work in the sphere of CSR.

also shows how a research center can work effectively not only on issues related to agricultural production but also on processing, marketing, and consumption.

New R&D approaches, such as the PMCA, cannot be easily “scaled up” or “transferred” to other settings. However they may be usefully adapted and applied elsewhere if attention is paid to the local context. The PMCA was developed to respond to a particular set of problems with a specific crop in a specific region. However, through capacity building efforts, the PMCA has also been applied successfully with other crops facing other challenges and opportunities in other countries and regions. As Innovation Briefs 4 and 5 show, the PMCA was not simply “transferred” from one place to another; in each case it was necessary to tailor the approach and strengthen local capacities to fit local circumstances and needs. The PMCA has contributed most to development where it has been employed as one part of a broader set of interventions that have included research, strengthening multi-sectorial platforms, policy influence, and public awareness.

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◆ Further reading

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