



ILAC Working Paper 12

Brokering Innovation for Sustainable Development: The Papa Andina Case

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June 2010

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Citation: Devaux, A., J. Andrade-Piedra, D. Horton, M. Ordinola, G. Thiele, A. Thomann and C. Velasco. 2010. *Brokering Innovation for Sustainable Development: The Papa Andina Case*. ILAC Working Paper 12, Rome, Italy: Institutional Learning and Change Initiative.

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Brokering Innovation for Sustainable Development: The Papa Andina Case¹

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Abstract

The inadequate linkage of knowledge generation in agricultural research organizations with policy-making and economic activity is an important barrier to sustainable development and poverty reduction. The emerging fields of sustainability science and innovation systems studies highlight the importance of “boundary management” and “innovation brokering” in linking knowledge production, policy-making, and economic activities. This paper analyzes how the Papa Andina Partnership Program, based at the International Potato Center, functions as an innovation broker in the Andean potato sector. As a regional initiative, Papa Andina operates as a “second-level innovation broker,” backstopping national partners who facilitate local innovation processes in their respective countries. Papa Andina works to strengthen local innovation capacity and to foster “innovations in innovation” – the development of more effective ways of bringing stakeholders together to produce innovations that benefit small-scale farmers. There are virtuous feedback loops between first- and second-level innovation brokering functions. The paper outlines the approaches Papa Andina has developed and promoted for fostering innovation brokerage at these two levels and the types of results obtained. It then identifies some important challenges that Papa Andina faces in innovation brokerage at the international level. The paper concludes with a discussion of broader policy issues related to the roles and functions of innovation brokers and boundary organizations in promoting sustainable development.

Keywords: boundary organization; innovation broker; market chain development; multi-stakeholder platform; native potato; partnership; boundary management

¹ The authors would like to thank the Swiss Agency for Development and Cooperation (SDC) and New Zealand’s International Aid and Development Agency (NZAid) for their support and contributions to the work and results presented in this paper. Thanks also to Rachel Percy and James Smith for useful comments on an earlier version of this paper, to Kay Sayce for editing, and to Cristina Sette for coordinating the publication process.

1. Introduction

This Working Paper deals with a central challenge facing international agricultural research organizations, including those affiliated to the Consultative Group on International Agricultural Research (CGIAR): How to contribute significantly to sustainable development and poverty reduction while maintaining a focus on scientific research that produces international public goods (IPGs). A recent discussion paper produced by the Global Donor Platform for Rural Development and the European Initiative for Agricultural Research for Development (EIARD) (Ashley et al., 2009:1, 7) characterized the problem as follows:

There has been a major tension between good science and applied agricultural research, in NARIs [national agricultural research institutes] and also within the CG system.

Years of failing to respond to development needs have led to a situation where those engaged in planning agricultural and rural development often perceive research programmes of the NARIs, through to the CGIAR centres, to have limited relevance to the development agenda.

The Working Paper focuses on an approach that international agricultural research centers and their national partners are experimenting with to link the worlds of research and action and promote pro-poor innovation: Partnership Programs that work to broker innovation processes, develop more effective ways of fostering innovation, and strengthen national innovation capacities.

When the CGIAR system was established in the early 1970s, its mission was “to use the best science in advanced countries to develop technologies for the benefit of food deficit countries and populations” (Lele, 2004). Over time, as donor priorities shifted and the limitations of a narrow “pipeline” approach to productivity enhancement became apparent, the CGIAR mandate expanded to include poverty reduction and environmental protection. New research programs were added to address issues of food policy, institutional arrangement, and the management of water, forest, and fishery resources.

The CGIAR’s current mission is to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy, and environment (www.cgiar.org). The research priorities include genetic improvement, sustaining agriculture biodiversity, the sustainable management and conservation of water, land and forests, improving policies and facilitating institutional innovation. Although these priorities cover a wide range of subjects, it is important to note that they are priorities for *research*, which aims to produce IPGs, taken to mean “research outputs of knowledge and technology generated through strategic and applied research that are applicable internationally to address generic issues and challenges consistent with CGIAR goals” (Harwood et al., 2006). The CGIAR Science Council encourages centers to focus on research that addresses problems of broad international importance and discourages them from engaging in applied research and development activities that address local problems (CGIAR Science Council, 2006).

CGIAR centers have produced new knowledge and technologies that have helped to increase food production and reduce rural and urban poverty (Evenson and Gollin, 2003; Hazell, 2008; Kelly et al., 2008). Nevertheless, problems of poverty, hunger, and environmental degradation remain daunting in many developing regions (IAASTD, 2009). As Ashley et al. (2009) noted, despite substantial donor investment in agricultural research over many years, “many of the outputs of research have not impacted on poverty.”

Increasingly, those who provide funds for research expect their investments to benefit poor people (Adato and Meinzen-Dick, 2007). Consequently, there has been growing emphasis on “research for development” and a search for research and development (R&D) methods that ensure the relevance and use of research results. The increasing emphasis on research impact has challenged the status quo for research organizations and has stimulated a major reform process in the CGIAR system, which is presently underway (Ashley et al., 2009:3).

Over the years, international agricultural research organizations have used a number of approaches to link research more effectively with development initiatives and farmers, including outreach programs, farming systems research, participatory technology development, networking, and partnership (Horton et al., 2009; Scoones and Thompson, 2009). Recently, there has been experimentation with innovation systems approaches that shift attention from increasing the supply of new technology to facilitating innovation processes in which new solutions to technical and institutional problems are co-produced by diverse stakeholders in interactive learning processes. An innovation system can be defined as “a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into social and economic use, together with the institutions and policies that affect their behaviour and performance” (World Bank, 2007). Various factors can trigger innovation, including changes in policies, markets and technology. Attitudes and institutional structures determine how individuals and organizations respond to such triggers.

Papa Andina is a Partnership Program hosted by the International Potato Center (CIP).² Since its establishment in 1998, Papa Andina has worked with national partners in Bolivia, Ecuador, and Peru³ to promote innovation processes in market chains that benefit small-scale potato producers in highland areas (Devaux et al., 2009; Meinzen-Dick et al., 2009). In each country the national partners function as “*innovation brokers*” who facilitate innovation processes in potato market chains. These processes involve not only researchers, but also other agricultural service providers, policy-makers, small-scale farmers, and market agents. Papa Andina’s Coordination Team functions as a “*second-level innovation broker*” in that it supports and backstops the national teams, facilitates learning and knowledge sharing among them, and encourages the co-development of approaches and methods for improving innovation brokering processes at national level.

Papa Andina and its partners have received national and international recognition and awards for their innovative work.⁴ Based on successful experiences in the Andes, some of Papa

² CIP is an international agricultural research center affiliated to the CGIAR (www.cipotato.org).

³ Through its Strategic Partners, Papa Andina works with a range of local partners in each country. Its Strategic Partners are: Bolivia – the PROINPA Foundation; Ecuador – the National Potato Program, INIAP; and Peru – the INCOPA Project (Peru). The partners’ names in Spanish are: Fundación PROINPA (Promoción e Investigación de Productos Andinos) (www.proinpa.org/); Programa Nacional de Raíces y Tubérculos rubro Papa (PNRT-Papa), INIAP (www.iniap-ecuador.gov.ec/); and Proyecto INCOPA, a coalition of private and public organizations that aims to improve small-scale potato farmers’ access to markets (www.cipotato.org/papandina/incopa/incopa.htm).

⁴ In 2005, CIP, INCOPA, and a private firm, A&L Exportaciones y Servicios SAC, won the *Peruvian Award for Entrepreneurial Creativity*, given by the Peruvian University for Applied Sciences (<http://creatividadempresarial.upc.edu.pe>) for developing T’ikapapa (bagged native potatoes) through an initiative that “values the enormous diversity of Andean potatoes, brings them to urban consumers, and generates sustainable businesses for small farmers”. In 2008, INCOPA and Papa Andina won the award again, this time “for exploiting the diversity of native potatoes in expanding the competitiveness of products from the Andean region.” In 2007, INCOPA and Papa Andina won the international *SEED Award for Entrepreneurship in Sustainable Development*, an annual competition designed to support local, innovative partnerships in developing countries working to achieve poverty eradication and environmental sustainability (www.seedinit.org/about-the-seed-awards/index.html). In 2007 INCOPA, A&L Exportaciones y Servicios SAC, Cadenas Productivas

Andina's approaches have been applied by other groups to broker innovation processes in other value chains in the Andes and in other regions. Despite these achievements, however, a number of challenges remain. For example, a recent external evaluation noted that Papa Andina lacks a clear "theory of change" for its work. The evaluators also commented on the ambiguity of some of the roles and responsibilities of Papa Andina's Coordination Team and those of its national partners, particularly with regard to responsibilities for achieving impact. There is also uncertainty about the future sustainability of Papa Andina and the functions it performs (Bebbington and Rotondo, 2010). As we will see in Section 2, evaluations of many other innovation brokers have reached similar conclusions.

In this paper, after a brief review of the literature on "innovation brokerage" and the related topic of "boundary management," we describe the development of Papa Andina as an innovation broker. We then describe the approaches it has used to broker innovation processes, the types of results obtained, and the challenges it faces as an innovation broker. Based on the Papa Andina case, as well as prior research, we close with a discussion of policy issues related to the role of innovation brokers in linking research with action to support sustainable development and in catalyzing pro-poor innovation processes in other settings.

2. Boundary Management and Innovation Brokerage

This section presents highlights of recent applied research on "boundary management" and "innovation brokerage." Much of the literature on boundary management is associated with the work of the Sustainability Sciences Program at Harvard University's Center for International Development.⁵ The literature on innovation brokerage, in the field of innovation systems studies, has been summarized by Klerkx et al. (2009).

2.1. Boundary management

In their report on a major study of knowledge systems for sustainable development, Cash et al. (2003:8086) emphasized the importance of boundary management:

This study suggests that efforts to mobilize S&T [science and technology] for sustainability are more likely to be effective when they manage boundaries between knowledge and action in ways that simultaneously enhance the salience, credibility, and legitimacy of the information they produce. Effective systems apply a variety of institutional mechanisms that facilitate communication, translation and mediation across boundaries.

The study found that scientific information is effective in influencing decision-making so long as it is seen as credible, salient, and legitimate. In this context, *credibility* refers to the perceived scientific adequacy of the technical evidence and arguments; *salience* relates to the relevance of the information to the needs of decision-makers; and *legitimacy* reflects the perception of stakeholders that the information was produced in a way that was "respectful of

Agrícolas de Calidad (CAPAC) Perú, Supermarket Wong, producer organizations, and Papa Andina won the *World Challenge Award*, a competition sponsored by BBC World News and Newsweek, in association with Shell, that rewards projects or small businesses that have shown enterprise and innovation at a grassroots level (www.theworldchallenge.co.uk/previous-winners.php). In 2008 INCOPA and Potato Andean won Peru's *Ardilla de Oro*, awarded annually by Peru's Catholic University for a marketing campaign that contributes to social development in Peru (www.infoandina.org/node/26072).

⁵ www.hks.harvard.edu/centers/cid/programs/sustsci.

stakeholders' divergent values and beliefs, unbiased in its conduct, and fair in its treatment of opposing views and interests" (Cash et al., 2003).

The credibility, salience, and legitimacy of information are tightly linked in the sense that an increase in one of them generally comes at the expense of a reduction in the others. For example, if efforts are made to maximize the relevance of information for decision-makers, methodological shortcuts might be made that reduce the credibility of the findings. Similarly, use of state-of-the-art research methods that maximize the credibility of research results might alienate decision-makers who do not understand the methods used (therefore reducing legitimacy) or delay the delivery of results until they are no longer relevant or useful to the decision-makers.

Cash et al. (2003) identify three key functions that contribute to effective boundary management:

- *Communication*. Active, iterative, and inclusive communication between researchers and decision-makers is crucial in efforts to mobilize knowledge in the service of practical action
- *Translation*. Understanding between experts and decision-makers is often hindered by jargon and differing assumptions about what constitutes a persuasive argument. For this reason, translation is often needed to ensure that participants from different institutional settings understand each other
- *Mediation*. Although communication and translation are essential for effective information flows between researchers and decision-makers, they are seldom enough to ensure that research influences decision-making. Because stakeholders often have conflicting interests, mediation is usually needed for mobilizing science for practical action

Boundary management functions can be carried out effectively through various organizational arrangements and procedures, but are frequently performed by "boundary organizations" responsible for managing one or more specific boundaries. Although they have lines of responsibility and accountability to groups on both sides of the boundary, these organizations can provide a forum or "safe space" in which members from participating organizations can come together to discuss and negotiate problems and solutions.

Empirical studies of boundary management show that "not all organizations that bring together divergent perspectives necessarily result in anything new or better" (Schneider, 2007:60). Successful boundary organizations tend to exhibit an inclusive leadership and management style (Schneider, 2007:76) that facilitates the co-production of plans, strategies, models, methods, or reports that are viewed as salient, credible, and legitimate by those involved and by their organizations. Studies also highlight the important contribution made by particular individuals, known as *boundary agents*, who play key roles in "creating and sustaining relationships, building trust, communicating information needs and concerns, and bridging gaps between various stakeholder groups (McNie et al., 2008:2; see also Kristjanson et al., 2009 and Reid et al., 2009).

2.2. Innovation brokerage⁶

Insights from the literature on industrial and agricultural innovation have recently been brought together within the concept of agricultural innovation systems (Klerkx et al., 2009). The World Bank (2007:6-7) defines an innovation system thus:

⁶ This section is based on Klerkx et al. (2009).

An innovation system may be defined as comprising the organizations, enterprises and individuals that together demand and supply knowledge and technology, and the rules and mechanisms by which these different agents interact. The innovation systems concept focuses not merely on the science suppliers but on the totality and interaction of actors involved in innovation. It extends beyond the creation of knowledge to encompass the factors affecting demand for and use of new and existing knowledge in novel and useful ways. Thus, innovation is viewed in a social and economic sense and not purely as discovery and invention.

Klerkx et al. (2010:390) note that “in the AIS [agricultural innovation systems] approach, innovation is considered the result of a process of networking and interactive learning among a heterogeneous set of actors, such as farmers, input industries, processors, traders, researchers, extensionists, government officials, and civil society organizations.”

One implication of innovation-systems thinking is that the *innovation capacity* of a country’s agricultural sector depends on: the extent of shared visions; effective linkages and information flows among public and private actors; incentives for cooperation; adequate marketing, legislative, and policy environments; and well-developed human and organizational capital (Hall, 2006; Gijsbers, 2009; Klerkx et al., 2009).

Past efforts to strengthen agricultural innovation systems focused mainly on training and organizational capacity development (Horton et al., 2003). Attention is now shifting towards improving incentives for cooperation and strengthening linkages among relevant actors. The importance of having intermediary organizations that link the various actors involved in innovation is becoming recognized (Szogs, 2008; Klerkx et al., 2009; Kristjanson et al., 2009). These intermediaries have been referred to as “innovation intermediaries” or “innovation brokers”.

Howells (2006:720) defines an *innovation intermediary* as “an organization or body that acts as an agent or broker in any aspect of the innovation process between two or more parties”. The provision of brokerage and mediation services might or might not be the primary role of an innovation intermediary. For example, a research or extension organization might, as a sideline, broker innovation in some of its projects. Winch and Courtney (2007:751) define an *innovation broker* more narrowly as “an organization acting as a member of a network ... that is focused neither on the organization nor the implementation of innovations, but on enabling other organizations to innovate”.

Klerkx et al. (2009:413) identify three main functions of an innovation broker:

- *Demand articulation*: Articulating innovation needs and visions and the corresponding demands in terms of technology, knowledge, funding and policy
- *Network composition*: Facilitating linkages among relevant actors
- *Innovation process management*: Enhancing alignment in heterogeneous networks of actors with different objectives, institutional norms, values, incentives, and reward systems. This is a continuous activity that involves boundary management, translation, and mediation to build trust, establish working procedures, foster learning, and manage conflict and intellectual property

A number of risks and challenges to effective innovation brokerage have been identified in the literature, which Klerkx et al. (2009:414-415) summarize in three points:

Tensions over legitimacy. The legitimacy of an innovation broker depends on the extent to which stakeholders consider the broker to be a relatively neutral “honest broker”. Neutrality is never absolute “because brokers always exercise a certain degree of steering”, but the degree of steering needs to be acceptable to those involved in the innovation process. To minimize

tensions over legitimacy, brokers should avoid taking over management and ownership of the innovation process from innovation network partners, and should attend to the goals and interests of each partner. Tensions are inevitable in innovation networks because innovation tends to challenge current practices and the participants often have conflicting interests.

Ambiguity of functions. Innovation brokers and intermediaries are often linked to research organizations, non-governmental organizations (NGOs) or donors, which can lead to confusion or ambiguity about their role in the innovation process. Due to this association with parent organizations engaged in research or other activities, other participants in innovation networks sometimes view innovation intermediaries as competitors for resources rather than neutral facilitators.

Intangible effects / unwillingness to pay. Assessing the impact of innovation brokers is difficult because of the indirect and intangible results of their work. They do not produce technologies or innovations, but work to improve the performance of innovation systems composed of other actors. The difficulty in assessing the impact of innovation brokers applies both *ex-ante* (making it difficult to justify allocating funds to brokerage activities) and *ex-post* (making it difficult to demonstrate “proof of concept” through the documented impact of successful brokerage). The current emphasis on logframe-based planning and evaluation, “hard” and “SMART”⁷ indicators, and short-term results all exacerbate this problem, as funders aim to support the production of tangible outputs in short-term projects (rarely more than 3-5 years). Innovation brokers need more time to establish themselves and produce significant results in terms of strengthened capacity and improved performance of local agricultural innovation systems. Similar difficulties in acquiring funding for boundary-spanning activities that support innovation processes have been reported in the CGIAR (Kristjanson et al., 2009:5052).

2.3. Implications for CGIAR-based innovation brokers

The literature on boundary management and innovation brokerage reviewed in Sections 2.1 and 2.2 is overlapping and complementary in many respects. In this section we bring together some major themes from the two sets of literature that are relevant for analyzing Papa Andina and other boundary organizations that are attached to CGIAR centers and that function as innovation brokers.

An innovation broker can be viewed as a type of boundary organization that specializes in brokering or facilitating innovation processes involving several other parties, but does not itself engage in the innovation process. The main functions of an innovation broker are to facilitate the following processes:

- articulation of demands for innovation and technology
- creation of effective innovation networks
- management of innovation processes

In performing these functions, innovation brokers need to pay particular attention to ensuring that all network members consider the information generated and exchanged to be salient, credible, and legitimate. Given the inherent tradeoffs between these information characteristics, innovation brokers need to skillfully balance the diverse information needs and standards of different groups. They should also be skillful in communicating technical and non-technical information, translating it effectively (so that it is understood by parties

⁷ SMART is shorthand for Specific, Measurable, Achievable, Realistic, and Time-bound.

from different institutional and cultural backgrounds), and mediating between participants with different, and often conflicting, interests and agendas.

International agricultural research and innovation tend to be characterized by a range of challenging traits: “immature” and highly fractured national innovation systems in developing countries; weak capacity at the level of individual organizations performing various R&D functions; weak or unproductive inter-organizational relationships often characterized by mistrust; significant language and cultural differences between the diverse groups in the private, public, and non-governmental sectors and those operating at local, national, and international levels; significant imbalances in power and access to resources, especially between “northern” and “southern” partners (with CGIAR centers typically falling into the “northern” category); and considerable variation in all these traits from region to region, country to country, and sector to sector.

Innovation brokers attached to or associated with CGIAR centers can be considered “second-level innovation brokers” in that they do not facilitate national- or local-level innovation processes, but support the work of national and local partners who take the lead in brokering innovation processes in their countries. In this context, a key role for a second-level innovation broker attached to a CGIAR center could be to facilitate the co-production of new approaches and methods for improving innovation processes.

The traits listed highlight the need for CGIAR-based innovation brokers to balance competing demands. On one hand, they need to establish themselves as “honest brokers,” trusted to negotiate fair deals among diverse actors with different objectives and interests. On the other hand, however, they need to steer innovation processes in ways that strengthen national innovation capacities. This often involves pushing for the expansion of an innovation network in ways that traditional partners might find threatening. Second-level innovation brokers therefore need to balance their roles as honest brokers in negotiation and as advocates for capacity strengthening.

CGIAR-based innovation brokers are often expected to provide specialized scientific information for decision-making. Playing such an “expert” role, however, conflicts with serving as an independent process facilitator. It also increases the risk that the CGIAR center begins to dominate local innovation processes, rather than playing a backstopping role.

To effectively help strengthen local innovation capacity, center-based innovation brokers need to work behind the scenes and promote the achievements of local actors (Horton et al., 2003). Playing such an invisible and catalytic role, however, makes it difficult to assess their results and measure “tangible impact” or “value added.” The consequent lack of hard evidence could jeopardize obtaining funding support for innovation brokers.

Klerkx et al. (2009:432) note that “innovation brokers ... always have to perform a balancing act.” For the reasons outlined in this section, CGIAR-based innovation brokers need to be particularly adept at balancing conflicting needs, priorities, and agendas.

3. The Papa Andina Initiative

Much of the literature on boundary management and innovation brokering is abstract, and there are few detailed case studies on the structures of boundary organizations or the approaches used by innovation brokers to facilitate innovation processes and strengthen innovation capacities. In this section, we analyze four aspects of Papa Andina’s evolution as a second-level innovation broker:

- its shift in focus (and paradigm) from regional research to regional learning and innovation brokering
- how it is structured and its relationship with first-level partners
- the approaches it has developed to facilitate innovation processes and strengthen national innovation capacities
- the types of results it has achieved through its work with national partners

3.1. Shift in focus from research to learning and innovation

Papa Andina was designed to strengthen potato research capacity in Bolivia, Ecuador, and Peru through the development of a regional research program. In line with the CGIAR strategy at the time, outlined by de Janvry and Kassam (2004:159), it sought to develop “a regional approach to research planning, priority setting and implementation” involving CIP’s traditional research partners in the Andes – the national potato research programs.

It soon became clear, however, that national policy-makers and potato researchers were less interested in developing a regional potato research program than in coping with external forces that were buffeting their organizations. Production-oriented agricultural research had fallen out of favor with international donors and national governments, research funding was falling precipitously, and market-chain approaches were being promoted as part of a new development agenda that researchers found alien and threatening.

To address these issues, Papa Andina linked up with the New Paradigm Project of the International Service for National Agricultural Research (ISNAR) (de Souza Silva, 2001; de Souza Silva et al., 2001), which offered a theoretical framework for understanding and managing organizational change. The framework emphasized that research organizations operate in highly dynamic environments and need to anticipate and respond with agility to changing demands and opportunities for their services.

Encouraged by these ideas, Papa Andina gradually shifted its focus from devising a regional research agenda to developing a regional learning agenda and strengthening national capacities for innovation, making use of resources in the region, incorporating new ideas, and adapting them to local circumstances. This shift involved developing and using participatory approaches, facilitating teamwork and group decision-making, and collaborating with new types of partners outside the usual circle of research organizations. The changes took some time to be incorporated into the way Papa Andina and its partners worked. The co-development of several approaches for facilitating innovation (described in Section 3.3) was central to moving from a focus on research to one on learning and innovation.

The shift in focus was radical, and continues to be controversial within the international agricultural research community. For example, a recent review of social sciences in the CGIAR notes that “IS [innovation systems] theory remains underdeveloped and exceedingly difficult to operationalize empirically ... we see only a very limited role for this line of research within CGIAR social science while the concepts and methods remain seriously underdeveloped and the CGIAR lacks appropriately trained staff to enjoy a high likelihood of generating breakthroughs” (CGIAR Science Council, 2009).

3.2. Organizational structure and relationships with partners

Papa Andina began as a CIP project funded by the Swiss Agency for Development and Cooperation (SDC). It has evolved into a Partnership Program with different donors, and spans the institutional boundaries of CIP and R&D partners in Bolivia, Ecuador, and Peru. Over the years, Papa Andina has managed a portfolio of complementary donor-funded

projects that aim to stimulate pro-poor innovation and develop national innovation capacities in the potato sector. All its work has been funded through donor projects, rather than through CIP's core budget.⁸

Papa Andina is part of CIP's research structure, which is made up of Research Divisions and Partnership Programs (CIP, 2004:59). Partnership Programs are characterized by the direct involvement of partners in program governance and implementation. Papa Andina has its own advisory body – the Coordination Committee – that includes representatives of its Strategic Partners, its Coordination Team, CIP, SDC, and the agricultural sector in each country. This creates multiple lines of accountability between Papa Andina and its main stakeholders. It also reports through CIP's management system. Some of its approaches and innovative strategies for linking research with action and some of the results achieved in the Andes have been reported as CIP outputs and outcomes, and are becoming part of CIP's research strategy.

Papa Andina's Coordination Team is made up of CIP staff members and consultants based in Peru (3), Bolivia (2), and Ecuador (1). The Papa Andina Coordinator, who is based in Lima, Peru, makes frequent trips to field sites in all three countries and the management style is markedly "horizontal" (Bebbington and Rotondo, 2010: 36). Major decisions are made at Papa Andina's annual meetings or at meetings of the Coordination Committee.

The Coordination Team works closely with focal points and collaborators in one R&D organization in each country. Known as "Strategic Partners", these organizations are: the PROINPA Foundation in Bolivia; the National Potato Program at INIAP in Ecuador; and the INCOPA Project in Peru.⁹ The team members are based at CIP or with the Strategic Partners. This facilitates communication between the team and the partners, but "in some cases this co-location may have weakened the independence of the coordination team and created uncertainty in the eyes of stakeholders as to institutional identities" (Bebbington and Rotondo, 2010: 37).

Most of Papa Andina's work in Bolivia, Ecuador and Peru is led by the Strategic Partners and is implemented directly by them or via local organizations known as "Operational Partners" (Figure 1). In this sense, therefore, Papa Andina operates as a second-level innovation broker. Its Coordination Team is not directly involved in brokering in-country innovation processes. Instead, it works to support and co-fund the Strategic Partners by creating an appropriate environment or "innovation ecology", facilitating the implementation of innovation processes in each country, and acting as a "broker of innovations for innovation."¹⁰ The main types of support that the Coordinating Team provides are methodology development and support for innovation brokering, knowledge sharing through regional activities, and grants for operations in each country.

⁸ A CGIAR center's "core budget" is unrestricted in the sense that center management has discretion over the use of the funds to implement the center's program. In contrast, "project funds" must be used according to agreements between the center and the donor that specify budgets, output and impact targets, and timelines.

⁹ The organizations' names in Spanish are: Fundación PROINPA (Promoción e Investigación de Productos Andinos), Bolivia (www.proinpa.org/); Programa Nacional de Raíces y Tubérculos rubro Papa (PNRT-Papa), INIAP, Ecuador (www.iniap-ecuador.gov.ec/); and Proyecto INCOPA, Perú (www.cipotato.org/papandina/incopa/incopa.htm), a coalition of private and public partners that aims to improve small potato farmers' access to markets.

¹⁰ For a discussion of this term, and some examples, see Hall (2003).

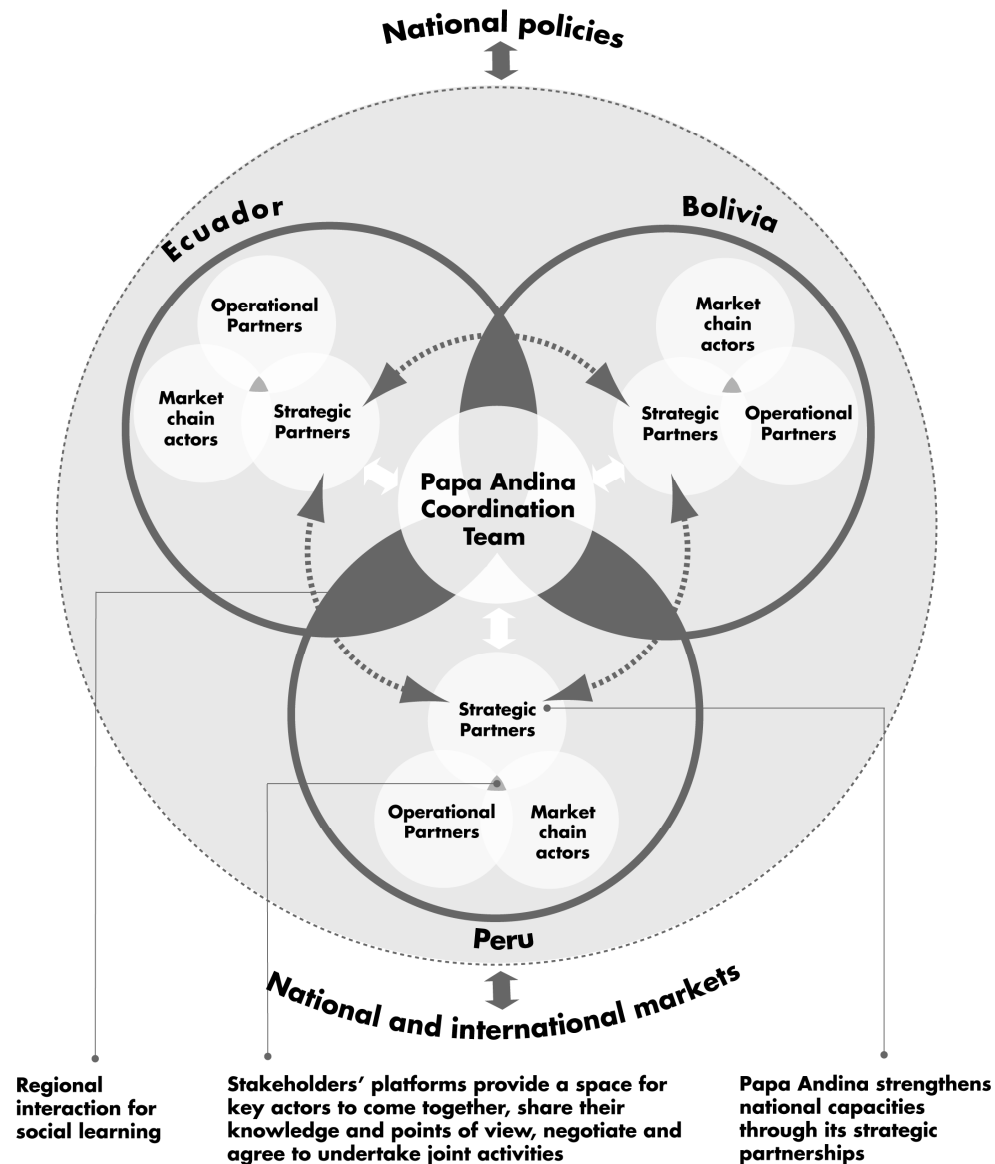


Figure 1: Interaction mechanisms among key actors in the Papa Andina Partnership Program

A key Papa Andina strategy is to strengthen the innovation capacity of national partners by delegating responsibilities and authority to them. An external evaluation of Papa Andina found that country-level activities were so closely associated with the Strategic Partners that many Operational Partners, producers, and other stakeholders knew little, if anything, about Papa Andina, and assumed that they were participating in or benefiting from the activities of PROINPA, INIAP, or INCOPIA (Bebbington and Rotondo, 2010:38).

3.3. Approaches for brokering innovation processes

Papa Andina has developed and promoted several R&D approaches for brokering innovation processes and strengthening national innovation capacities. At this level, it promotes “innovations in innovation”, as described in Section 3.4. Some of these approaches are

outlined here and have been taken up by other organizations involved in brokering innovation in other settings.

Going beyond the “HYV technology regime”

The CGIAR is best known for the “Green Revolution” of the 1970s, which ushered in the use of high-yielding varieties (HYV) of staple food crops along with chemical fertilizers and pesticides. Green Revolution technology boosted crop production and yields on irrigated land, contributing to significant reductions in food prices. Early success with the technology helped consolidate an “HYV technological regime” in the CGIAR, which prizes breeding and genetic engineering over other more holistic approaches, such as integrated natural resources management and agro-ecology, which are more closely associated with concepts involved in evolutionary thinking, systems analysis, complexity, and innovation (Vanloqueren and Baret, 2009).

Whereas modern high-yielding potato varieties have been introduced into many parts of the Andes, native varieties (landraces) still predominate on small farms in areas above 3,500 meters in Bolivia, Ecuador and Peru. Until recently, native potatoes received almost no attention in potato research agendas. And yet, with their diversity in color and shape, high cooking versatility, nutritional profile, and traditional, low-input production practices, native potatoes represent a valuable asset for small-scale farmers in the region (Ordinola et al., 2007; Meinen-Dick et al., 2009). As they grow best at the higher altitudes where small-scale farmers predominate, using them in the development of new commercial products should give these farmers a comparative advantage. Based on a market study that indicated untapped market potential for native potato products in Peru, Papa Andina began exploring ways to exploit the potential of native potatoes through new product development, resulting in several new products being developed and marketed in Bolivia and Peru. In Ecuador, where native potatoes have almost disappeared from the market, efforts have remained focused on improving small-scale farmer access to markets for modern potato varieties.

Papa Andina’s experience with native potatoes illustrates that innovation brokers need to avoid being constrained by the prevailing research agenda and dominant technological regime. Successful pro-poor innovation needs to begin with an understanding of the assets, perspectives, and needs of key stakeholders in the innovation process – especially those of small-scale farmers and market agents – and then building on this understanding. The main approach that Papa Andina has developed for initiating innovation processes that capitalize on local assets and address local needs is the Participatory Market Chain Approach (PMCA), described here.

The Participatory Market Chain Approach

In 2003, in order to stimulate agricultural innovation, Papa Andina and CIP’s Social Science Department began to use a participatory approach known as *Rapid Appraisal of Agricultural Knowledge Systems* (RAAKS) (Engel and Salomon, 2003). RAAKS brings diverse stakeholders together to stimulate social learning, build trust, and foster innovation. Papa Andina used RAAKS to bring market chain actors together to identify and develop market opportunities that could be of mutual benefit. Rapid market assessments and focus group approaches were added, and gradually a new approach emerged, known as the *Participatory Market Chain Approach*.¹¹ The PMCA seeks to build trust and connectedness and to facilitate the acquisition of useful knowledge, skills, and attitudes for innovation. One of its goals is to foster relationships that continue after the completion of the specific PMCA application.

¹¹ The PMCA methodology has been documented in Spanish and English in User Guides and Training Guides (Bernet et al., 2006, 2008).

Box 1: Applying the PMCA to unleash the potential of native potatoes in Peru

Papa Andina applied the PMCA in Peru with researchers, farmers, private companies, and nutritional and gastronomic experts to find innovative ways to expand the market for native potatoes through product development.

Early products opened new market niches and brought higher prices for farmers. Among these were T'ikapapa (bagged native potatoes), which received the prestigious BBC World Challenge Award and the UN Seed Award, and Jalca Chips (multicolored native potato chips), which took off in the duty-free shops at Lima airport. As visibility and interest in native potatoes rose, Papa Andina worked with small-scale farmers, NGOs, and large multinationals to develop more products, while boosting the bargaining power and participation of local farmers. As a result, a supply chain has been created that gives more than 200 farmers access to a stable market and a negotiated price that provides them with a 20-40% profit margin. Export channels are opening, too, and in 2009 the overall demand for native potatoes in Peru was estimated to have reached 2000 metric tons, generating close to \$US1 million in revenues for farmers.

The emergence of a native potato market has fueled the research agenda. CIP scientists, along with NGOs and farmers, are working on ways to increase quality and yield while safeguarding the sustainable and natural production methods valued by consumers.

An important aspect of consolidating the market is to position the native potato on the political agenda. Interested stakeholders have linked up to form lobbying platforms, recording successes such as the creation of National Potato Days in Peru and Ecuador and the compilation of quality norms for potatoes and their processing. A CIP-led "vision exercise" implemented in Bolivia, Ecuador, and Peru, involving public and private sector representatives, identified opportunities for public and private investment to increase the competitiveness of the sector as a whole, with the focus on small-scale farmers.

The PMCA engages those who make their living from a market chain ('market chain actors') and public and private service providers (such as researchers, credit providers and development workers) in facilitated group processes in which market opportunities are identified and assessed and innovations are developed. The objective is to stimulate commercial innovation (such as the development of new products or the identification of market niches). Experience has shown that developing new products or identifying new markets stimulates institutional innovation (such as the creation of new supply channels) and technological innovation (such as improved potato production methods).

An R&D organization initiates the PMCA process by identifying key market chain actors and supporting organizations, and by conducting market research to learn about these actors and their activities, problems, and priorities. Thematic groups are formed that focus on market opportunities, and facilitators lead group meetings to analyze the opportunities and conduct the R&D activities needed to develop specific innovations.

As the process advances, the aim is for the facilitator to hand over responsibilities to the market chain actors. This has often proven difficult, however, and R&D organizations have found it necessary to continue in a facilitating mode.

In promoting and supporting the use of the PMCA, Papa Andina's partners play the role of innovation broker. Key facilitation functions involve:

- encouraging relevant actors to participate in the PMCA process (network formation)
- ensuring effective communication and mutual understanding among the diverse groups implementing the PMCA (communication and translation)
- mediating conflicts, which are often inevitable during market-chain innovation
- catalyzing problem-solving when groups get stuck, often by linking to external sources of expertise (boundary spanning)
- In order to consolidate the innovation processes initiated through the PMCA and to promote the scaling up of its interventions with partners, Papa Andina has developed

complementary approaches focusing on stakeholder platforms, policy dialogue, corporate social responsibility, and horizontal evaluation.

Box 2: The Bolivian Andean Platform (ANDIBOL): Result of the PMCA and innovation platform in its own right

ANDIBOL provides an example of a multi-stakeholder platform that emerged from an innovation process triggered by use of the PMCA, and which itself has stimulated further innovation.

Farmers who produce native potatoes above 3,500 meters in altitude in the Bolivian highlands are among the poorest people in Latin America. Native potatoes (landraces) and the local knowledge for their cultivation and transformation are among the main assets possessed by farmers in these areas. Traditional freeze-dried potato products known as *chuño* and *tunta* are typically used for home consumption, intra-household exchange, and trade in local markets. The ANDIBOL platform – an alliance of small potato producers, R&D organizations, NGOs, and medium-scale enterprises – was established to promote the development and exploitation of market niches for *chuño* in demanding urban markets.

In 2003, PROINPA used the PMCA to foster innovation in the market chains for *tunta* and *chuño*. This work involved farmers, traders, food-processing firms, exporters, cooking schools and R&D organizations. In the first cycle, participants prepared a set of *Bolivian Quality Standards for Chuño and Tunta*. In 2004, the PMCA was used again to identify new market opportunities for *chuño* and *tunta*, and ways to improve the products' image in different market from the traditional ones. This exercise involved some participants from the first application plus chefs and a food-processing firm manager. It resulted in a new product: clean, selected and bagged *chuño*, marketed under the brand 'Chuñosa'. In 2005, based on their successful collaboration to date, participants established the *Bolivian Chuño and Tunta Platform*, which later was christened the *Bolivian Andean Platform (ANDIBOL)* (Velasco, et al, 2009).

ANDIBOL has established links with market agents to develop quality *chuño*-based products with a higher price and to explore the export potential of *chuño*. The platform has developed a strategic plan and has obtained funding to support new projects. Facilitated by PROINPA, the platform has 13 core members including R&D organizations, processing firms, and 4 farmers' associations grouped in APEPA (Asociación de Productores Ecológicos Primero Aroma), which represents 485 families in 20 communities.

One of the platforms' functions is to promote innovation around traditional *chuño* products. Introduction of *chuño* into urban markets and access to export markets have stimulated demands for quality improvement in production and processing. These demands, in turn, have led to work with a local manufacturer to develop simple machines for classifying and peeling native potatoes and with R&D organizations to improve potato production technology and management of the Andean tuber weevil, a major pest in the Andean highlands. Recently a new brand *Chef Andino* was established for marketing products based on *chuño* as well as Andean grains (flours, instant soups, and flakes). On average, farmers now receive 30-40% more for their *chuño* when sold to supermarkets as compared to their traditional market.

While ANDIBOL has made great strides, it is not without challenges, which include relatively weak farmer participation, limited influence of farmer demands on research agendas, the small number of participating farmers, and limited volumes of produce marketed.

Establishing multi-stakeholder platforms

In the context of the Papa Andina initiative, a multi-stakeholder platform is defined as “a space for interaction between different stakeholders who share a resource or common interest and interact to improve their mutual understanding, create trust, learn, reach consensus over priorities, define roles and engage in joint action” (Thiele et al., 2009). These platforms have proven useful for consolidating innovation processes during and after a PMCA, helping to maintain dialogue and sustain the innovation dynamics and working relationships among stakeholders. Papa Andina and its partners have promoted two types of platform. The first is structured along the market chain and brings farmers together with traders, processors, retailers, researchers, chefs and others to foster new product development. The second is structured around geographically delimited supply areas. In both cases, key functions are

communication, translation, and mediation, which require leadership and competent facilitation. Platforms can be used to address market coordination problems, helping small-scale farmers to meet the volume, quality, and timeliness standards demanded of particular market chains. They can also help in coordinating the acquisition of inputs, bringing NGOs and others in to provide technical support or access to credit (Thiele et al., 2009). Papa Andina's partners have promoted the establishment of multi-stakeholder platforms and supported capacity development for platform leadership and facilitation. Although the platforms have performed useful innovation, marketing, and advocacy functions, their continued operation has often depended on external facilitation and financial support.

Box 3: Linking smallholders to the new agricultural economy: Study of multi-stakeholder platforms in Ecuador

A study issued by the FAO (Cavatassi, et al., 2009) analyzes the effects of participation in MSP designed to link small potato farmers to the market in Ecuador. Since 2003, INIAP (with funding from SDC and support from Papa Andina) has facilitated the implementation of MSP in Ecuador's highlands. In this context, MSP are alliances between farmers and suppliers of agricultural services, including research institutes, NGOs, universities, and local governments. The platforms, and subsequently the Consortium of Smallholder Potato Producers (CONPAPA), have directly linked smallholders' organizations to higher value markets for their products, including fast food restaurants and a company that produces potato chips. An important component of the platforms was training provided through Farmer Field Schools, where farmers learned about integrated crop management, especially in relation to Andean weevil (*Premnotrypes vorax*), late blight (*Phytophthora infestans*) and seed management.

The FAO study evaluated the platforms (between 2003 and 2007 in 2 provinces of the central Andes), to determine whether they had successfully linked small farmers to higher-value markets and the effects that this has had in terms of yield, profits, use of agricultural chemicals, and agrobiodiversity.

The results show that participants in the MSP had higher potato yields and profits than non-participants. Participants' yields averaged about one-third higher than those of non-participants, and their average selling price was about 40% higher. Participants spent more on inputs, but their profits were approximately 6 times greater than those of non-participants.

Linking to the platforms did not appear to lead to negative consequences from agricultural intensification. Participants used less fungicide than non-participants; they used more insecticides, but the products were less toxic. Platform participants also made somewhat better use of protective equipment (gloves, plastic ponchos, face masks), although its use is still limited. The results show that the platforms increased the welfare of participating farmers and suggest that they can effectively link small potato producers to the market. The success of the platforms can be explained firstly by their intervention along the whole value chain and by reducing transaction costs; secondly by the introduction of technological innovations to increase yields; and thirdly by an improvement in social capital that is expressed, among other things, as greater trust among the actors in the production chain, which enables small-scale producers to overcome the obstacles to entering more demanding markets.

Facilitating policy dialogue

Innovation in the value chain might stall without policy support and corresponding changes in the legal framework. To influence pro-poor policies in the potato sector, Papa Andina's partners have developed two strategies to promote dialogue among researchers, civil society organizations, the private sector and political decision-makers. The first strategy is based on influencing public opinion through media coverage about the importance of potato value chains and the challenges facing them, and bringing these issues to the attention of political decision-makers. The second aims to directly engage policy-makers in developing a vision and strategy for the potato sector (Devaux et al., 2010). Here, Papa Andina's role has been to draw on methodological expertise developed in other value chains and, with its partners, to

adapt and validate these approaches for potato value chains. In establishing spaces for policy dialogue, Papa Andina is working on the boundary between politics and science, as referred to by Guston (2000).

Promoting corporate social responsibility

In value-chain innovation processes, there is always a risk that the lion's share of the benefits will go to large commercial interests. Corporate social responsibility (CSR) is an entry point for addressing the issue of small-scale farmers' interests with the largest players in the value chain. CSR refers to an ethical form of management that takes into account the expectations of a company's stakeholders in order to achieve sustainable development (Thomann et al., 2009). In a value chain, two important areas for CSR work are: developing a market segment willing to pay a premium price for a high-quality, environmentally and socially sustainable product; and developing the competitiveness of supplier organizations to reduce asymmetries in bargaining power. Papa Andina works to sensitize its partners to CSR, facilitating dialogue among large companies, NGOs, and farmer organizations on the application of CSR in the market chain. In this way, it facilitates communication and translation among stakeholders with differing perspectives, and through mediation it seeks to address asymmetries in power and areas of conflicting interest among stakeholders in the value chain (for example, small-scale producers and large corporate buyers).

Conducting horizontal evaluations

The "horizontal evaluation" approach was developed to promote knowledge sharing and collective learning within the Papa Andina network (Thiele et al., 2006, 2007; Bernet et al. 2010). It combines elements of self-assessment and external peer evaluation within the setting of a regional workshop. In these workshops, two groups – a local project team and a group of peers from other organizations – assess the strengths and weaknesses of an experience (usually within a project), and then compare their assessments. Papa Andina's horizontal evaluations have a strong regional knowledge-sharing component because most of the peer evaluators come from abroad. There are usually important differences between the self-assessment conducted by the local project team and the assessment by the external peer group. The ensuing dialogue helps both groups fill information gaps and address points of disagreement. No attempt is made to reach broad agreement on the merits of the project. Instead, the local team formulates recommendations for improving the project, and the peer evaluators look at how they can apply lessons learned during the evaluation in their own work back home.

Participants report that these horizontal evaluation workshops have been extremely useful opportunities for learning about the strengths and weaknesses of new R&D approaches, as well as for building common visions, language, and understanding among diverse stakeholders. As a result of horizontal evaluations, many local project teams have significantly altered the way they pursue their innovation agenda. After the workshops, when the peer evaluators return home, they often begin to experiment with things they learned during the evaluation. For example, after the horizontal evaluation of a PMCA project in Peru, Bolivian participants began to work with the PMCA themselves, and subsequently made major contributions to the approach. In contrast, Ecuadorian participants did not see the value of the PMCA in their context, preferring to focus their energies on strengthening farmer organizations.

Through the use of horizontal evaluations, the Papa Andina Coordination Team provides a safe space for frank and open discussion, the airing of disagreements among network members, and constructive criticism of work and results. The constructive conflict that takes place between national teams has been an important source of social learning, contributing to

the development of Papa Andina's approaches. It has also motivated national teams to perform at high levels. For national partners, representing high-profile R&D institutions in the Andean region, horizontal evaluation exercises have generated ideas for improving current practices, insights into the potential use of new R&D methods, and greater disposition to learn and share knowledge with other R&D teams.

3.4. Types of results achieved

New R&D approaches

The most important products of the Papa Andina initiative are the new approaches for fostering innovation and strengthening innovation capacity, described above. They can be considered *innovations in innovation*, which Hall (2003:v) refers to as “institutional and organizational innovations that emerge as new ways of developing, diffusing, and using new knowledge” or “new ways to generate and promote innovation”. Lawrence et al. (2002:281) refer to them as “proto-institutions” – new approaches, practices, and norms that transcend a particular collaborative relationship and could become new institutions if they diffuse sufficiently.

User guides on the PMCA and horizontal evaluation have been produced (Bernet et al., 2006, 2010) and many reports have been published on Papa Andina's approaches, co-produced by CIP and R&D organizations in Bolivia, Ecuador, and Peru. Some of the new approaches have been applied by other groups in other settings and have the potential to develop into new ways of conducting agricultural R&D.

Through partnerships with other organizations and CIP's global network, the PMCA has been used in a range of market chains in the Latin America, Africa, and Asia. The first pilot application of the PMCA outside the Andes was in Uganda, where it was used in the potato, sweet potato and vegetable market chains. The Ugandan experience indicates that the approach can foster pro-poor innovation in local commodity chains in sub-Saharan Africa (Horton, 2008; Horton et al., 2010b). Through alliances with other organizations, including Practical Action,¹² and in collaboration with CIP's research divisions and regional projects (most notably Alianza Cambio Andino),¹³ the PMCA has also been applied in market chains for milk, coffee, potatoes and other commodities in the Andes. In a project supported by the Australian Center for International Agricultural Research (ACIAR), the PMCA is being used in Indonesia to develop and promote dynamic potato market chains. The horizontal evaluation approach has been applied by other regional projects in the Andes, such as the InnovAndes and Cambio Andino projects, and some professional evaluators have picked up the approach from specialist publications (Thiele et al., 2006; 2007).

Strengthened innovation capacity

An important goal of innovation brokering is to strengthen innovation capacity. Actually measuring such capacity, however, can be daunting (Horton et al., 2003; Baser and Morgan 2008; Klerkx et al., 2009). As noted in Section 2, key aspects of innovation capacity are the willingness of groups to work with other stakeholders in innovation processes, openness to a range of ideas for diagnosing and solving problems, and the nature of relationships among R&D organizations, public authorities, NGOs, private companies, farmers and other stakeholders. Although the extent to which Papa Andina has contributed to innovation capacity in the region has yet to be measured, illustrative results can be noted:

¹² <http://practicalaction.org>.

¹³ www.cambioandino.org/index.shtml.

- researchers who have worked with Papa Andina generally think now more in terms of facilitating innovation processes, rather than simply conducting research
- groups that have worked with Papa Andina (researchers, NGOs, other service providers, farmers, or other market chain actors) are generally more open to working with others
- new approaches using native potatoes to improve small-scale farmer livelihoods, which were not considered as a priority in the past, are now part of the agenda of R&D organizations in the region
- working with such approaches as the PMCA and multi-stakeholder platforms is now common practice among Papa Andina’s partners, and some of the R&D agendas are now more market oriented
- researchers and NGOs that have worked with Papa Andina are more aware of gender issues and the need to achieve impact at farmer level

Commercial, technological, and institutional innovations

Papa Andina’s experience shows that commercial innovation often stimulates institutional and technological innovation. Applications of the PMCA in Bolivia and Peru have led to the development of native potato products, including selected “gourmet” native potatoes, naturally colored chips, and selected and bagged *chuño* and *tunta*, a potato product dehydrated using a traditional highlands method (Ordinola et al., 2009). Stakeholder platforms and CSR have played useful roles in developing pilot products into economically and socially sustainable larger-scale businesses. For example, after the first native potato chips were introduced in Lima on a small scale, a large commercial firm developed a higher-quality product based on supply from small-scale Andean farmers that is now available all year round in supermarkets, is marketed on TV, and is certified as “ethically produced” by an independent body. This boom in the native potato market has increased the demand for these potatoes, which are grown mainly by small-scale farmers (Figures 2 and 3).

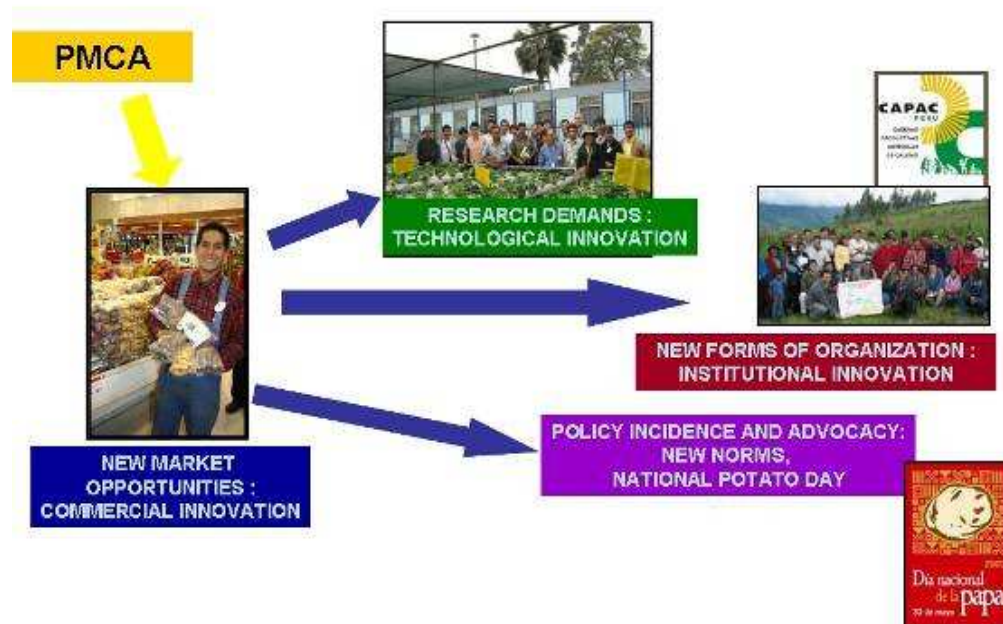


Figure 2. The PMCA as a catalyst for innovation

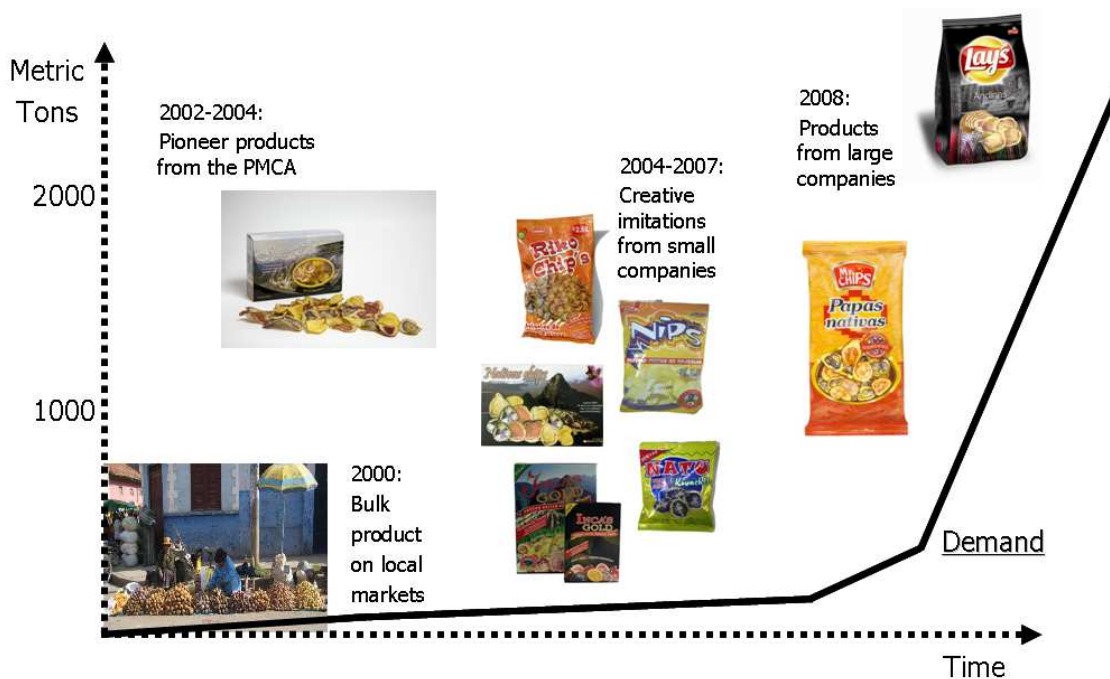


Figure 3. Milestones in the development of the market for native potato chips in Peru

Commercial development has led to demands for new institutional arrangements, such as quality standards for potato products. Stakeholder platforms – themselves institutional innovations – have served as springboards for further institutional innovation. In several cases, policy dialogue or specific working groups facilitated by Papa Andina and its partners have been necessary to consolidate institutional innovations. This was the case, for example, in getting native potato varieties included in Peru's official seed certification system and in establishing National Potato Days in Peru and Ecuador (which, in turn, inspired the FAO to proclaim 2008 as the International Year of the Potato).

Commercial innovation has also stimulated innovation in potato production. For example, it has improved the seed production system for native potatoes in Peru by including 61 native varieties in the national commercial variety list and establishing a seed system aimed at low-resource potato farmers in Ecuador (FAO, 2006). Research is also being conducted in Peru and Bolivia on post-harvest practices to improve the quality and shelf life of selected and processed native potatoes in high-quality markets.

Farm-level impact

Achieving farm-level impact is not a direct result of the work of an innovation broker (Klerkx et al., 2009). An innovation broker needs to interact with partners and stimulate their capacity to improve small-scale farmer competitiveness. This applies even more so to the work of second-level innovation brokers operating regionally or globally. Nevertheless, Papa Andina's experience provides insights into the impact pathways connecting innovation brokers with farm-level changes. The development of market opportunities for potatoes has enabled small-scale Andean farmers to access higher-value markets for the first time, despite the high production and transaction costs associated with scattered smallholder production. In Bolivia, the Andibol stakeholder platform has enabled farmers to sell processed *chuño* in local supermarkets and start exporting to Spain (20 to 40% price increase compared to local market). In Ecuador, stakeholder platforms have enabled hundreds of small-scale farmers to sell their potatoes to fast-food restaurants, resulting in an increase in their yields from 6.3 to

8.4 MT/ha and in their gross margins from \$US 63 to 259/ha (Cavatassi et al., 2009). In Peru, the establishment of a business model incorporating CSR has made it possible for farmer organizations in the Central Andes to sell native potatoes on contract to a multinational company. Access to markets has motivated farmers to strengthen their organizations and to introduce changes in their production and post-harvest practices, such as improvements in pest and disease management, seed quality, and the classification of harvested potatoes (Velasco et al., 2009). These new practices have increased yields and improved product quality.

4. Challenges facing Papa Andina

In this section, we discuss some of the challenges to Papa Andina's operations and sustainability. As outlined in Section 2.2, Klerkx et al. (2009) identified three broad types of challenges to effective innovation brokerage: the independence and legitimacy of the broker; the ambiguity of the functions performed by the broker; and the issues of funding, evaluation, and willingness to pay for innovation brokerage services. Papa Andina has faced challenges in each of these areas.

4.1 .Independence and legitimacy

The institutional base

At times, some partners have suspected that Papa Andina's position has reflected the interests of CIP rather than those of the partners or countries involved. For example, some partners in Ecuador have questioned Papa Andina's promotion of the PMCA, of native potatoes, and of the participation of private entrepreneurs in driving innovation processes. They did not think the PMCA reflected local Ecuadorian needs and circumstances. Another issue relates to competition for funding. As both CIP and its national partners have scarce core resources and actively seek project funding from donors, and because Papa Andina depends entirely on donor project funding, national partners have sometimes viewed Papa Andina as a competitor for scarce resources. It is important to note that, in other instances, the close working relationship between national organizations and Papa Andina has helped them obtain donor funding.

Donor interests and influence

As Papa Andina is funded by donor organizations, it sometimes finds it necessary to mediate between the interests and priorities of its donors and national partners. For example, in recent years, donors have sought to involve the private sector to a greater extent in R&D efforts, but researchers in some NARIs view the involvement of the private sector with suspicion. Other themes of high priority to many donors, such as gender, empowerment, and partnering with NGOs, have not always been the top priority of national partners. In some cases, promoting such themes has compromised Papa Andina's legitimacy as an "honest broker" of innovation processes at the national level.

Governance and intellectual property

Funding for Papa Andina, including the funds received by national partners, goes through CIP. This has led partners to express concern sometimes about the sharing of resources, center expenses, and power imbalances. A recent evaluation questioned the current management model of Papa Andina as a Partnership Program based at CIP, with one Strategic Partner in each country. The recommendation was to establish a broader consortium with a more diverse set of Strategic Partners (including NGOs and representatives of the private sector), with CIP

playing the role of one among many partners. But there was no specific analysis of the capacity of these actors to play a second-level innovation-brokering role.

There have also been sensitivities related to intellectual property. Papa Andina's approaches draw on the contributions of many actors with different institutional affiliations, but few of the contributors have the time and ability to participate in writing up results of Papa Andina's work for publication. Additionally, the publication of Papa Andina's work is seldom a priority for the contributors' home institutions. These issues have led to problems related to authorship and to individual and institutional recognition, which have often required dialogue, negotiation, and compromise.

4.2. Ambiguity of functions

What is the appropriate research role for Papa Andina?

While Papa Andina's main function is that of innovation broker, as a program based at CIP and within the CGIAR it is expected to conduct research and produce results of global relevance and use. There can be confusion between its brokerage work to support partners in local innovation processes and its research work that might not be of direct use to these partners. A related issue is that the demand-oriented research focus promoted by Papa Andina does not always fit with the traditional bio-physical research on which the CGIAR has built its reputation and legitimacy; the emphasis on innovation strategies and processes remains controversial in the CGIAR.

Which boundaries is Papa Andina managing?

As an innovation broker, Papa Andina works to manage boundaries between organizations that can play a role in innovation processes, in order to promote pro-poor innovation with potatoes in the Andes. It appears, however, to be doing much more on managing boundaries between research entities, other service providers, small-scale farmers and market agents at the country level than on managing boundaries between CIP and these groups. Indeed, Papa Andina's Coordination Team has often felt frustrated in its efforts to mobilize CIP expertise in support of national innovation processes and to help improve the impact of CIP research in the Andes. As we note in the Conclusions section, however, this frustration might stem from unreasonable expectations in this area.

What is Papa Andina's role relative to the role of national innovation brokers?

As a program hosted by CIP, Papa Andina is expected to *support* national and local-level innovation processes, not to *lead* them. Between support and leadership, however, there is a broad continuum of types and levels of involvement. Some degree of involvement is essential for learning, action research, and effective steering of innovation processes. The challenge of operating as a "hands-off" second-level innovation broker is compounded by the fact that national and local innovation brokers are generally based at R&D organizations whose priorities and core activities could jeopardize the legitimacy of the organization as an "honest broker." For example, an innovation agent based at a national research organization might feel under pressure (overt or covert) to channel research contracts to his / her own organization, even when another organization might be more appropriate. In such situations, Papa Andina sometimes needs to steer processes (particularly with regard to the composition of innovation networks) and mediate agreements among parties with conflicting interests and agendas. As a result, the first- and second-level innovation brokerage roles sometimes become confused.

4.3. Evaluation, funding, and willingness to pay

Dependence on short-term donor project funding

To date, all Papa Andina's work has been funded through donor projects with time horizons of 4 years or less. SDC funding has been renewed twice and extended over a total of 12 years, allowing the Coordination Team to develop good working relationships with national-level teams. Nevertheless, the inherently unpredictable nature of donor project funding is not ideal for developing innovation brokerage capacity, either at national or international level.

Limits of objective-based performance measurement

Recent trends in project management and evaluation that call for the use of logical frameworks, SMART indicators, and "hard evidence" of impact put Papa Andina and other innovation brokers at a disadvantage compared with projects that produce tangible outputs and promise short-term, direct impact on poverty. Papa Andina's direct results are at the level of innovation processes and capacity strengthening, which are inherently difficult to document, measure, and attribute to specific actors (Perrin, 2002; Klerkx et al., 2009:415).

Burden of multiple external evaluations

Since Papa Andina is now well known for its work and has many donors and stakeholders, it has been subjected to numerous external reviews and evaluations. During 2009 and early 2010 alone, Papa Andina and many of its national partners were asked to participate in seven external evaluations conducted for three donor organizations.¹⁴ These evaluations diverted the scarce human resources of Papa Andina and its partners from brokering innovation processes to meeting donors' accountability needs.

5. Conclusions

The Papa Andina case illustrates the useful roles that a Partnership Program attached to a CGIAR center can play as a second-level innovation broker and the types of results that can be achieved. It also highlights important challenges facing innovation brokers. Here, we present some of the main conclusions of our analysis and identify possible ways forward.

1. Second-level innovation brokers can play useful roles in fostering innovations in innovation, strengthening national and local innovation capacities, and promoting pro-poor innovation processes.

Three important roles for second-level innovation brokers are:

- fostering innovations in innovation through developing and testing new R&D approaches, such as the PMCA, that can be useful for articulating demands for innovation, forming innovation networks, and managing innovation processes
- strengthening the capacity of national and local innovation brokers who, in turn, can broker local innovation processes and strengthen national innovation capacity
- creating a dynamic innovation environment that fosters feedback and learning between the innovations-in-innovation level and the innovation brokering level linked to national contexts and particular value chains

2. Innovating in innovation processes requires substantial capacity development.

¹⁴ There were evaluations of: (1) SDC projects in the area of biodiversity; (2) the SDC agricultural research program; (3) the Papa Andina project (financed by SDC); (4) the INCOPA project (financed by SDC); (5) the Andean Change Alliance (financed by DFID); (6) the Latin American program of NZAid; and (7) the InnovAndes project (financed by NZAid).

Our analysis has shown that becoming an effective innovation broker requires the application of a complex set of new knowledge, attitudes, and skills. For example, based on assessments of experiences with the PMCA in the Andes and Uganda (Devaux et al. 2009; Horton et al., 2010b), we believe that the successful introduction of the PMCA into new settings requires a multi-pronged capacity-development strategy implemented over several months.¹⁵

Implementing such strategies takes time and resources, but they should be seen as an investment in innovation capacity that will generate returns for many years. Our analysis indicates that the capacities developed, at both individual and innovation-system level, continue to be utilized long after the initial PMCA exercise formally ends. In many cases, the creative imitations that occur years after the initial efforts are the most important ones.

When introducing innovation-brokering approaches such as the PMCA to new settings, it should be kept in mind that each situation presents a unique combination of socio-economic, political, institutional and technological conditions. The approach therefore needs to be customized for use in each country and market chain. Institutional sustainability issues should be dealt with as priorities from the outset of any process involving the introduction of new approaches.

3. There are tradeoffs between boundary management and innovation brokering.

Being an effective innovation broker requires being a trusted and reliable “match-maker” to ensure that the most appropriate actors are involved in innovation processes. Papa Andina’s experience highlights the importance of involving a wide range of national actors with different areas of expertise. If an innovation agent is overly concerned with engaging the services of his / her host institution, this could hamper the development of local innovation capacity.

4. There are no simple recipes for the organizational locus and structure of a second-level innovation broker.

The Papa Andina experience indicates that being hosted by a CGIAR center has both advantages and disadvantages. Affiliation with a center can provide easy access to valuable technical inputs, expertise, and knowledge. It could also give the innovation broker the legitimacy to serve as an “honest broker,” vis-à-vis national actors. A CGIAR center also has recognized prestige within the national and international R&D community, which gives the innovation broker greater credibility. CGIAR centers can provide administrative and other facilities that may be valuable for an innovation broker operating regionally or internationally. On the negative side, being hosted by a CGIAR center that works on a limited set of commodities or resource areas could constrain the work of the innovation broker. An innovation broker based at a center might fall back into a technical, or expert, role, which is incompatible with the effective facilitation and brokerage of innovation processes. He / she might also be motivated to involve the center in activities for which it is not best suited. The center might have high overhead costs. And there could be pressure within a center to give

¹⁵ The main components of such a capacity development strategy are: (a) participatory planning and decision-making involving local actors; (b) negotiation with senior managers in lead R&D organizations to foster institutional commitment to the PMCA and to support raising funds for its application; (c) South-South learning exchanges via study tours to sites where the PMCA has been successfully used; (d) a comprehensive training strategy that includes action-oriented PMCA training workshops, use of the *PMCA User Guide* and complementary training materials, practical hands-on work with the PMCA in commodity groups, and backstopping and coaching by experienced PMCA facilitators, involving both face-to-face and virtual communications; (e) knowledge sharing among the PMCA practitioners working in different commodity teams; and (f) periodic learning-oriented reviews and evaluations to improve the process and document results (Horton et al., 2009: 387).

priority to research and the production of IPGs, rather than to what are perceived to be less valuable “service functions” or “development activities.” The innovation broker must find the right balance in responding to both agendas.

Some authors (for example, Bebbington and Rotondo, 2010:27) have suggested that it would be preferable for the innovation broker to be constituted as an independent consortium, but it is not clear how such an entity would function.

5. Traditional objective-based evaluation approaches and the mechanical use of logical frameworks are inappropriate for evaluating innovation processes and the work of innovation brokers, which are inherently complex and emergent.

Traditional tools for project planning, management, and evaluation, which have their origins in the engineering field, have serious limitations when applied to programs such as Papa Andina that seek to promote innovation in varied and dynamic contexts. As Perrin (2002:13) noted, “Most attempts at innovation, by definition, are risky and should ‘fail’ – otherwise, they are using safe, rather than unknown or truly innovative approaches.” To promote innovation, rather than focusing on pre-determined indicators or average results, evaluations should identify situations where actual impact has occurred and the reasons for success.

Similarly, Rogers (2008) noted that logical frameworks pose many challenges when applied to the evaluation of complex interventions that have numerous components, operate under varying and changing conditions, and have complex cause-effect relationships. These characteristics make complex interventions such as Papa Andina difficult to analyse. This has important implications not only for evaluating innovation projects, but also for planning and managing them. Rogers (2008:44) emphasizes the limitations of logical frameworks for performance measurement and the use of management results in complex interventions:

Particular care should be taken to not imagine that a logic model, however detailed, can be used to generate performance measures that can be used formulaically to modify implementation and improve performance when interventions have complex aspects.

There are also important methodological issues in the evaluation of capacity development, which is an essentially intangible property (Horton et al., 2003; Baser and Morgan, 2008).

Whereas it will always be inherently difficult for innovation brokers, especially when operating at the regional or international level, to document impact at the level of broad development goals, it is important for them to develop clear and testable “theories of change” or “impact pathways” for their interventions (Douthwaite et al., 2007; Rogers, 2008).

6. Innovation brokers can improve the linkage between international agricultural research and local innovation processes over time.

Papa Andina’s experiences make it clear that one should not expect such mechanisms as innovation brokering and boundary management to serve as a “silver bullet” for linking CGIAR research with local needs and innovation processes. These mechanisms could, however, contribute to a gradual process of alignment between the research priorities in CGIAR centers and locally articulated needs. A logical pathway for influencing the international agricultural research agenda would be to strengthen in-country and regional innovation capacity, so that local groups could work more effectively with national R&D organizations to strengthen the national innovation system and place demands on international programs.

No single entity such as Papa Andina should be expected to have a significant influence on the research agenda of its host center. CGIAR centers work on problems of global importance,

and core resources are assigned according to global priorities. Potato farmers in the Andes are a very small group in the total constituency of potato and sweet potato farmers whose problems CIP is mandated to address. CIP has prioritized key problems of global relevance, and a problem such as improved storage methods for native potatoes would rank very low in any priority-setting exercise driven by total number of beneficiaries or value of net benefits to research.

Nevertheless, if CGIAR centers supported innovation brokers in various parts of the world, this could lead to strengthened innovation capacity and improved articulation of technology needs and demands, which could exert significant influence on the research agendas of national agricultural research institutes and CGIAR centers.

Another promising avenue for influence is via donor-funded projects. As a very large share of centers' operating budgets comes through donor projects, one strategy would be for innovation brokers to seek to influence the priorities of donor-funded projects. This, in turn, could influence centers to focus on food security, environmental sustainability and poverty reduction linked to development outcomes in partnership with public and private research and development partners.

7. Investment in a network of innovation brokers could yield handsome returns.

Papa Andina has contributed to an emerging community of R&D professionals with the knowledge, attitudes, and skills needed to facilitate innovation processes among stakeholders and to foster market chain innovation. These professionals represent a potentially valuable resource that could be mobilized to facilitate innovation processes on a larger scale. Based on our (admittedly limited) experience, we believe that support for the development of a community or network of innovation brokers dedicated to facilitating pro-poor agricultural innovation would be a high-payoff area for international donor organizations, as well as for national and local governments and NGOs that wish to foster pro-poor innovation in developing regions.

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