



Collective action for market chain innovation in the Andes

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ABSTRACT

The Papa Andina network employs collective action in two novel approaches for fostering market chain innovation. The participatory market chain approach (PMCA) and stakeholder platforms engage small potato producers together with market agents and agricultural service providers in group activities to identify common interests, share market knowledge and develop new business opportunities. These forms of collective action have generated commercial, technological and institutional innovations, and created new market niches for Andean native potatoes grown by poor farmers in remote highland areas. These innovations have benefited small farmers as well as other market chain actors. This paper describes Papa Andina's experiences with collective action for market chain innovation. It then discusses the implications of these experiences for the understanding of collective action and the policy implications for research and development organizations.

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Introduction

The Andean region of South America is characterized by extreme social and economic inequalities. It is estimated that more than 60% of Ecuador's rural population and nearly 80% of Bolivia's and Peru's are poor (CEPAL, 2004). Poverty is especially prevalent in highland areas, where the potato is the main staple food and an important source of cash income. In areas over 3500 m above sea level, subject to frequent frost and drought, potatoes are among the few crops that can be grown. Over centuries, Andean farmers have developed more than 4000 native varieties of potato. In Peru and Bolivia, most native potatoes are cultivated by semi-commercial farmers for home consumption, barter and sale in local markets. At lower altitudes, more commercially oriented farmers grow modern varieties employing pesticides, herbicides, and chemical fertilizers. In Ecuador, where growing conditions are generally milder, native varieties have almost entirely been replaced by new varieties introduced by national breeding and seed programs.

Agricultural development is taking place in the context of rapid urbanization and increasing market integration. Farmers are confronted with many new market challenges as well as opportunities. Urbanization and increasing participation of women in the labour force are leading to a dietary transition towards convenience foods, animal protein, fresh dairy products, and higher consumption of

fresh fruits and vegetables. Packaged food sales and supermarket retail outlets are now found in most developing countries. Demand is also increasing for higher quality foods that meet ever-increasing standards of safety. Supermarkets are becoming major players in vertically integrated food marketing systems. Consequently, the production practices and livelihoods of small Andean farmers are increasingly influenced by the demands of urban consumers, market intermediaries and food industries (Reardon and Berdegue, 2002; Wilkinson and Rocha, 2006).

In contemporary agricultural markets, small farmers are often at a disadvantage in relation to larger commercial farmers who can supply larger volumes of quality-assured products, possess superior bargaining power, and have better access to information, services, technology and capital. Small farmers' limited access to physical and financial resources restricts their ability to expand and invest in technologies that increase efficiency and add value to primary production. Small farmers also frequently have limited technical skills and poor access to information and training for improving their production practices. The limited market surplus of individual small farmers inflates marketing costs, increasing transaction costs and the per-unit costs of assembly, handling and transportation. Small farmers also lack basic knowledge of the marketing system, current information on prices and market conditions, and bargaining power (Kruijssen et al., 2009; Berdegue, 2001).

Various approaches have been proposed to improve the prospects of small farmers in agricultural markets, including collective action via farmer organizations and cooperatives (Shepherd, 2007).

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In the present paper, we discuss two novel uses of collective action that involve not only small farmers but also market agents and agricultural service providers. The participatory market chain approach (PMCA) and stakeholder platforms foster market chain innovation in ways that benefit small farmers as well as other market chain actors. The main intended outcomes of these types of collective action are commercial, technological and institutional innovations. This differs from most cases of collective action described in the literature, which report on farmer organization for achieving economies of scale, enhancing small farmers' bargaining power or improving the management of common pool resources. The new forms of collective action reported on here, involving diverse market chain actors, researchers and other agricultural service providers, have been developed by the regional research and development (R&D) network, Papa Andina, which operates in Bolivia, Ecuador and Peru.

Perspectives on collective action and innovation

This paper is concerned with the use of collective action to foster pro-poor innovation in market chains. Much has been written on farmer organizations for managing common pool resources, and for marketing and service provision. There is also a rapidly growing literature on innovation processes. However, the role of collective action in innovation processes has received little attention to date. In this section we review relevant literature on collective action and on innovation, and identify key factors that will later be combined in a framework for analyzing collective action in market chain innovation processes.

Perspectives on collective action

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

There is an extensive body of literature on the role of collective action in managing common pool resources such as forests, fisheries, grazing lands, and irrigation water. Agrawal (2001) presents an exhaustive literature review that identifies 33 "critical enabling conditions" that contribute to the sustainability of common property institutions. These fall into four main categories:

1. Resource system characteristics (e.g., small size, well-defined boundaries, predictability, low levels of mobility, and feasibility of storing benefits from the resource).
2. Group characteristics (e.g., small size, shared norms, past successful experience with collective action (social capital), homogeneity of identities and interests, capable leadership, interdependence among group members, and low levels of poverty).
3. Institutional arrangements (e.g., rules are simple and easy to understand, locally devised access and management rules, ease in enforcement of rules, and graduated sanctions for breaking rules).
4. External environment (e.g., external support for organization, low levels of articulation with external markets, governmental bodies that do not undermine local authority, and supportive external sanctioning institutions).

Ostrom (1999) identifies other factors that are important for institutional development, such as the feasibility of improving

the resource and a low discount rate. Many authors emphasize the importance of social capital for the emergence and development of local organizations for collective action.

Based on a study of "associative peasant business firms" in Chile, Berdegue (2001) identified several factors that facilitate the emergence and development of collective action for marketing and value addition. These factors include: high transaction costs; policy incentives; presence of community groups and organizations, providing an important initial forum where alternatives can be discussed; support from external agents, such as NGOs or private extension firms; linkage to actors outside the rural community, providing access to external sources of information, expertise and financial resources; embeddedness in the rural community, facilitating more effective and less costly internal rules, decision-making processes and procedures for monitoring and evaluation; establishment of rules that are consistent with market signals; and potential to differentiate members' products through value addition.

Kruijssen et al. (2009) discuss the importance of social learning for collective action in the context of smallholder market participation. Social learning is defined as the process through which groups of people learn, by jointly defining problems, searching for and implementing solutions, and assessing the value of solutions for specific problems (Koelen and Das, 2002). Social learning brings about a shift from "multiple cognition" to "collective cognition". Individuals involved in social learning processes begin with quite different perceptions of their current situation and the potential for change; as they interact, they develop common, shared perspectives, insights and values. Dialogue and social learning foster collective cognition and social capital formation, both of which are necessary for effective joint action. Social learning and social capital formation are also key features of innovation processes.

Perspectives on innovation

Whereas research focuses on generating new knowledge, and technology development aims to create a supply of new production methods, innovation is concerned with the practical use of new knowledge. As Barnett (2004, p. 1) states, innovation involves "the use of new ideas, new technologies or new ways of doing things in a place or by people where they have not been used before".

The relationship between research and economic activity is not simple and linear but complex and interactive (Hall et al., 2001; Engel and Salomon, 2003; World Bank, 2007). Interactive social learning processes involving researchers and economic actors are crucial for ensuring that applied research generates useful new knowledge that is put into practical use. Since research organizations have traditionally worked in isolation from the end users of their technologies, institutional innovations that strengthen patterns of interaction between researchers and economic actors are crucially important for strengthening innovation systems.

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, p. xiv). Four key sets of factors influence the performance of innovation systems: the external environment, the diversity of actors involved, the values and attitudes of the key actors, and the institutional arrangements and patterns of interaction.

Different factors can trigger innovation, including changes in policies, markets and technology. Attitudes and institutions determine how individuals and organizations respond to such triggers. Behaviours that make organizations and policies responsive to

stakeholders' needs and interests can encourage innovation. Innovation is also stimulated by the interaction of individuals and groups with different backgrounds, interests and perspectives. Hence, groups that are more diverse generally have a greater potential for innovation. Even though participants with different economic interests may initially be sceptical about the benefits of interacting, the values, attitudes and patterns of interaction can change over time as a result of social learning, development of personal relationships, trust and other forms of social capital. The ability to interact constructively and work in new ways is crucial for the innovation performance of groups.

Recent studies of agricultural innovation highlight the utility of the value chain concept – a set of interconnected, value-creating activities undertaken by individuals and enterprises to develop, produce and deliver a product or service to consumers – as unit of analysis and focus of interventions aimed at stimulating innovations and developing innovation capacity (World Bank, 2007, p. 24). Thus, attention should not be directed at individual supply chain participants such as producers but at the overall supply chain capacity and the degree to which the chain in its entirety is able to compete.

Framework for analyzing collective action in market chain innovation

Ostrom and colleagues at the Workshop in Political Theory and Policy Analysis at Indiana University have developed a general framework for understanding institutions known as the Institutional Analysis and Development (IAD) Framework. It has three main components:

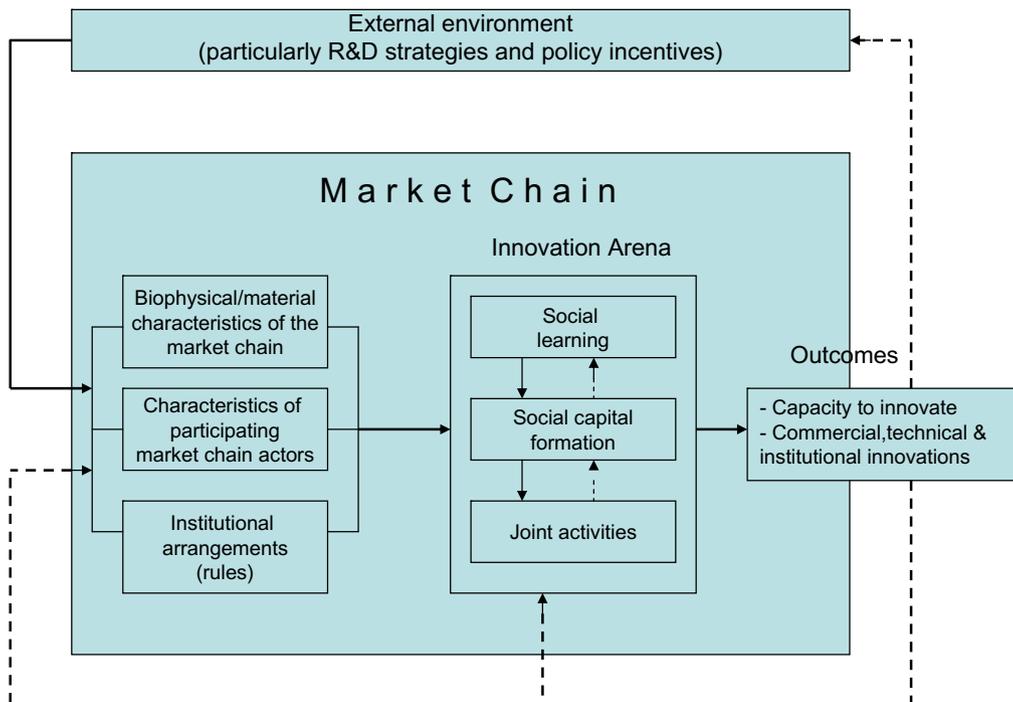
- The “Action Arena” in which participants interact.

- Three groups of “Exogenous Variables” that influence the “Action Arena” (biophysical/material conditions, attributes of the community and rules).
- The “Outcomes” produced (Ostrom, 2005, Fig. 1.2, p. 15).

In developing a framework for analysis of collective action in market chain innovation, we have built on the IAD framework and added the external environment component from Agrawal (2001) and the World Bank (2007). To focus attention on important innovation processes, we have also added the components of social learning, social capital formation and joint activities from Kruijssen et al. (2009). The resulting framework for analyzing collective action in market chain innovation is illustrated in Fig. 1.

The central focus of attention in this framework is the Innovation Arena where social learning, formation of social capital, and joint innovative activities lead to the development of innovations. The Innovation Arena is influenced by four sets of exogenous variables: the external environment, biophysical and material characteristics of the market chain, characteristics of market chain actors, and institutional arrangements. Based on the literature review reported in the previous section, particularly the works of Agrawal and Berdegué, we have identified a number of factors in each of these four areas that are likely to influence collective action processes and outcomes in the context of market chain innovation (Table 1).

In the resulting framework, the two major outcomes of collective action are strengthened capacity for innovation and commercial, technological and institutional innovations. As indicated by the broken lines in Fig. 1, these outcomes may influence the processes that take place within the Innovation Arena. For example, successful innovation may stimulate participants to invest more time and resources in joint activities. Over time, outcomes may also influence the four groups of exogenous variables. For example,



Source: Based on Ostrom (2005) Figure 1.2, Agrawal (2001), Kruijssen, Keizer and Guilliani (2007) and World Bank (2007) .

Fig. 1. Framework for analyzing collective action in market chain innovation. (See above-mentioned references for further information.)

Table 1

Exogenous variables that influence the emergence and outcomes of collective action in market chain innovation.

<i>External environment</i>	
1.	“Trigger” for initiation of collective action
2.	Support from external agents (such as research organizations, NGOs or governmental bodies) to stimulate innovation and facilitate group activities and provide technical and institutional backstopping
3.	Policy incentives for pro-poor market chain innovation
4.	Presence of community groups or organizations
5.	Collective action institutions at complementary levels (higher or lower)
<i>Biophysical/material characteristics of the market chain</i>	
1.	Characteristics of the commodity (e.g., perishability and production zones)
2.	Current uses and consumer perceptions of intrinsic value
3.	Potential to reduce transactions costs through market chain innovation
4.	Potential for product differentiation and value addition
<i>Characteristics of participating market chain actors</i>	
1.	Participation of diverse market chain actors and service providers
2.	High levels of dependence on the market chain
3.	Presence of social capital (norms, values, attitudes, and beliefs that predispose people towards collective action, as well as rules, procedures, precedents, and social networks)
4.	Capable leadership within the market chain and in the farming community
<i>Institutional arrangements (rules)</i>	
1.	Effective social learning processes, leading to development of collective cognition, social capital, and leadership capacity
2.	Locally devised rules that are simple, easy to understand, easy to enforce, and consistent with market signals
3.	Fair allocation of costs and benefits of collective action
4.	Graduated sanctions for non-compliance with rules
5.	Accountability/responsiveness of external agents to group members

Note: Based on Agrawal (2001, Table 2) and Berdegué (2001).

successful innovation may predispose policy makers to support future programs involving collective action.

Papa Andina’s use of collective action to foster pro-poor market chain innovation

Papa Andina was established in 1998 to promote pro-poor innovation in the Andean potato-based food systems. Financed mainly

by the Swiss Agency for Development and Cooperation and other donors, and hosted by the International Potato Center, the network includes about 30 partners in Bolivia, Ecuador and Peru. In each country, Papa Andina coordinates its activities with a “strategic partner” that plays a leadership and coordinating role in market chain innovation: the PROINPA Foundation in Bolivia, the INCOPA Project in Peru and the National Potato Program of INIAP in Ecuador. This network of partners reaches a growing number of poor rural households, currently estimated to be around 4000. The PMCA is used to bring researchers together with other agricultural service providers and market chain actors, including small farmers, to promote pro-poor innovations.

Interaction among the market chain actors is crucial for market chain innovation. In 2000, we began experimenting with a participatory approach to stimulate agricultural innovation known as ‘Rapid Appraisal of Agricultural Knowledge Systems’ (RAAKS). This approach, developed by Engel and Salomon (2003), brings diverse stakeholders together in a flexible, participatory process. Papa Andina began using RAAKS to foster pro-poor market chain innovation for native potatoes. Based on RAAKS, through action research we developed two complementary approaches to enhance innovation: the participatory market chain approach (PMCA) and stakeholder platforms.

The participatory market chain approach

In 2000, the INCOPA project began working with RAAKS to stimulate social learning, build trust and foster joint actions among potato market chain actors. They added tools for product and market development and re-christened the approach as the ‘PMCA’ (Bernet et al., 2006). The PMCA has three phases, usually implemented over several months. A R&D organization initially leads planning, coordination and facilitation. As the process advances, market chain actors take on more responsibility, and the R&D organization shifts to a supporting role (Fig. 2).

Phase 1 of the PMCA begins with a rapid market survey and ends with a workshop where market chain actors meet supporting R&D organizations to discuss possible innovations. Phase 2 involves a series of group meetings and applied research to analyze

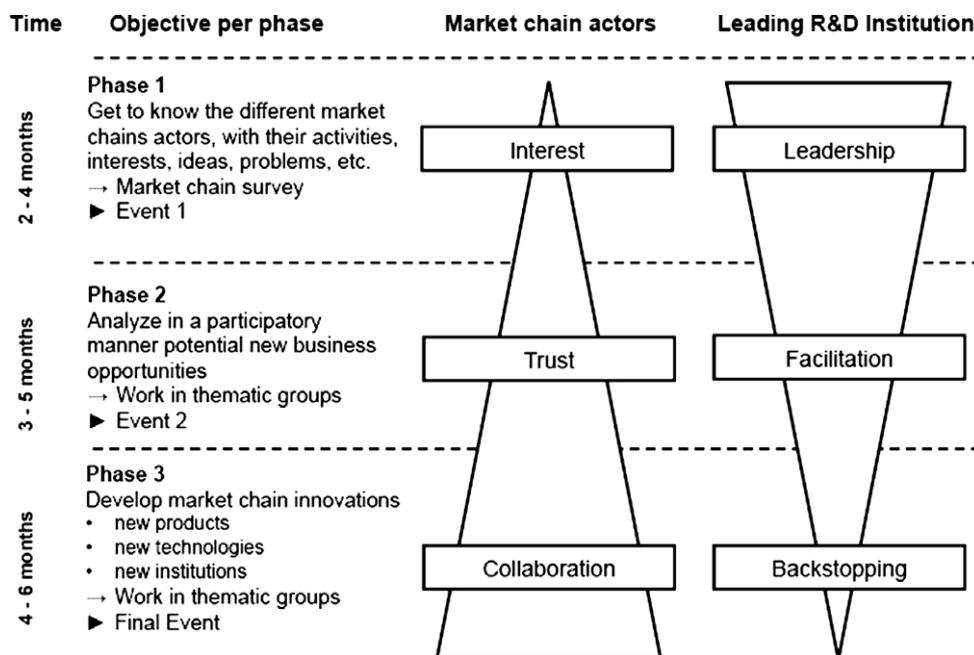


Fig. 2. Three phases of the participatory market chain approach. Source: Bernet et al. (2006).

market opportunities. A key goal of this phase is to build trust among participants. Phase 3 involves joint activities that seek to develop concrete innovations, which might be technical (e.g., new products, production practices or packaging) or institutional (e.g., farmer associations, stakeholder platforms or business arrangements such as contract farming agreements). The PMCA formally ends with a large public event where market chain actors and service providers present their innovations and meet national policy makers, donor representatives, the media and other 'VIPs'. After the formal closure, the R&D organization may be called on by specific actors or asked to backstop new institutions.

Stakeholder platforms

In the Andes, interactions among market chain actors and service providers are frequently characterized by lack of trust, and successful private–public partnerships and alliances are rare (Hartwich and Tola, 2007). Agricultural research organizations usually keep their distance from NGOs, farmer groups and traders. The quest for market-led innovation made it necessary to look beyond the research community and build relationships with a broader range of public and private actors. Papa Andina employs stakeholder platforms to promote interaction, social learning, social capital formation, and collective activities involving diverse actors in innovation processes.

Stakeholder platforms have been established at different levels. Local platforms facilitate interactions between potato producers, local authorities and service providers to empower small farmers, reduce marketing costs, and increase efficiency in service delivery. Market chain platforms bring farmers' associations together with traders, processors, supermarkets, researchers, extension agents, chefs and others to foster pro-poor innovation. In some cases, platforms also serve as representative bodies for interaction with policy makers.

Illustrative examples

The following examples present cases from Peru and Bolivia, where the PMCA has been developed and refined, and from Ecuador, where attention has focused on stakeholder platforms for strengthening farmer organizations.

Peruvian examples

In 2002, INCOPA initiated the PMCA in Peru with a market chain survey. Results were discussed in a meeting of nearly 100 stakeholders, including potato producers, wholesalers, processors, supermarket managers, researchers, and professionals from NGOs and international agencies. Based on this survey, two cycles of PMCA were implemented, one for potatoes in general and one specifically for native potatoes.

Innovations resulting from the first cycle included: 'Mi Papa' (a new brand of high-quality, fresh potatoes for the wholesale market), 'Papy Bum' (a new native potato chip product), and a series of online bulletins with daily information on wholesale prices and supplies for more than 20 types of potatoes. A national organization, CAPAC-Peru, was established to promote marketing of high-quality potato products, reduce transaction costs, and add value through innovation. Founding members included farmer organizations, NGOs, traders and processors. Today CAPAC represents 22 core members including five farmer organizations with 600 members.

In the second PMCA application, several new actors joined the process to develop new native potato products. CAPAC-Peru played a key role (Ordinola et al., 2007), and results included two new products: T'ikapapa and Tunta Los Aymaras.

T'ikapapa is the first brand of high-quality, fresh, native potatoes sold in Peru's leading supermarkets. First marketed in 2004, sales grew from 14 tons to over 70 tons in 2006. This has allowed more than 300 families in 10 highland communities to obtain 10–30% above the going market price for native potatoes. An agro-processing company, a member of CAPAC, owns the brand and contracts farmers to supply potatoes to the supermarket. CAPAC helps to organize small farmer groups to supply potatoes that meet market requirements. In 2007, INCOPA and its partners received a United Nations award for 'Supporting Entrepreneurs for Environment and Development'.

Tunta Los Aymaras is a brand of high-quality, freeze-dried, native potatoes developed through a coalition of farmers' groups, local government agencies, NGOs and a private service provider. Tunta is produced traditionally from native 'bitter potatoes' by small farmers in the high Andes and has generally been restricted to traditional Andean markets. Through collective action, farmers' marketing and processing capacities were strengthened, quality norms developed, and market studies undertaken. A farmers' association, 'Consortium Los Aymaras', was created to market this new product, and it also owns the brand.

Bolivian examples

The PMCA was applied in two regions of Bolivia. In Cochabamba, the PMCA was introduced from Peru in 2003, validated and adapted. PROINPA led the exercise with a local farmers' association, a food-processing firm and a supermarket in Santa Cruz. Based on the common interest identified by the participants, two new products were developed for sale in supermarkets: coloured chips made from native potatoes and high-quality, pre-packaged, fresh native potatoes. PROINPA gained a new approach for linking small farmers to markets; it helped the farmers' association to get better organized, build links with market agents, and upgrade the quality of its members' native potatoes. It also helped them to improve working relations and negotiation capacity with market chain actors.

From 2003, the PMCA was applied twice in the Department of La Paz in market chains for tunta and chuño, traditional freeze-dried products. These applications 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 coordination with national authorities. In 2004, the PMCA was used to identify new uses for chuño and tunta, and ways to improve the products' image. This exercise involved some participants from the first cycle 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, participants established the 'Bolivian Chuño and Tunta Platform', formalized as the 'Bolivian Andean Platform', to sustain and consolidate their collective action. Among other activities, the platform has established links with market agents to develop better quality chuño-based products with a higher price and to explore the export potential of chuño and tunta. The platform today represents 13 core members including four farmers' associations with around 200 members, processing firms, development projects, an NGO and a research organization, PROINPA. It has helped to build trust and social networks among its members and has improved links between small farmers and market agents on one hand, and R&D organizations and other service providers on the other.

Ecuadorian examples

INIAP's potato program initially attempted to create a national-level consortium of market chain actors and development organizations to address macro-level problems. When this effort failed, attention shifted to local stakeholder platforms to develop better collaboration among local institutional actors and farmers' organi-

zations. With financial support from the Swiss Development Cooperation (SDC), it has provided small grants for 'collaborative projects' that link small potato farmers with specific markets.

Platforms and collaborative projects were set up in the provinces of Tungurahua, Chimborazo in 2003, and in Cotopaxi and Bolivar in 2006. With initial leadership from INIAP, these involved 24 farmers' groups that were created through previous Farmer Field School experiences (they include around 200 members), universities, local governments, and NGOs representing 32 core members in total including the farmer groups' representatives. Platforms were organized around existing farmers' groups. Their activities have included marketing selected fresh potatoes to 29 restaurants, fast food outlets and processors in Ambato and Riobamba. Platform members grow the new Fripapa potato variety, which is in high demand for processing and fast food outlets. Through the platforms, researchers have interacted with small farmers as well as local authorities, development projects and NGOs. This has facilitated knowledge sharing, social learning and capacity building, leading to improvements in small farmer productivity and the quality of potatoes supplied to market. As a result of this process, a national organization, the Consortium of Small Potato Producers (CONPAPA), was established to support joint marketing activities.

Discussion

In this section, we summarize patterns that emerge from our examples of collective action in relation to the main components of the framework for analysis of collective action in market chain innovation (Fig. 1).

Role of external factors

In each of the cases described, the collective action was triggered by a research organization associated with Papa Andina, external to the market chain. Once local groups had been established with external facilitators, they took on lives of their own and often evolved in unexpected ways. All the groups were supported by such external agents as NGOs, local or national governments, and R&D organizations. The Bolivian and Peruvian groups benefited from policy support for market chain development. In contrast, in Ecuador policies emphasized farmer organization and empowerment rather than market chain development per se. In several cases, collective action for market chain innovation built on earlier groups, such as Farmer Field Schools, NGOs and farmers' associations, confirming the importance of prior experience with collective action. In some cases, when collective action got underway, complementary groups were established at other levels (for example, CONPAPA, CAPAC-Peru and the Bolivian Andean Platform).

Importance of market chain characteristics

As shown in the cases, joint marketing can reduce transaction costs. However, commercial innovation and development of high-value niches for potato products have generated more significant benefits for small farmers as well as other market chain actors. In Peru and Bolivia, use of the PMCA led to the development of new products based on native potatoes. In contrast, in Ecuador, where attention focused on organizing farmers' groups to respond to existing market opportunities for modern varieties, fewer commercial innovations, and benefits, have resulted.

Importance of participants' diversity

In the Bolivian and Peruvian cases, small farmers, market agents, researchers and service providers have participated in

groups working with the PMCA. In contrast, in Ecuador market agents have not been involved in the platforms. An important factor for innovation has been the trigger effect of researchers who brought new information and ideas. For example, in Peru and Bolivia, researchers suggested that it might be possible to market a colourful native potato product, and they assisted with laboratory testing of processing techniques. With these inputs, other participants took the lead in product development, testing and refinement. The Ecuadorian approach focusing on farmer organization has strengthened farmer organizations but has led to less market chain innovation.

Women were involved in all cases, more actively in marketing and processing than in production. In most of the cases, men assumed leadership at the community level, while women assumed leadership in R&D organizations in Bolivia and Peru. Small farmers are generally more dependent on the potato market chain than large retailers; this may be one reason why it is easier to engage small farmers in the PMCA than to engage market agents. Small Andean farmers have traditions of collective action at the community level, but not along market chains. Relations in market chains are traditionally characterized by lack of trust and cooperation. Hence, getting diverse market chain actors (including small farmers) to work together in innovation processes is itself a significant institutional innovation.

Institutional arrangements

One of the key challenges has been to provide adequate facilitation for social learning processes, which promote the development of collective cognition, social capital and leadership capacity. In most cases, a research organization took responsibility for facilitation. There has been a tendency for facilitators to introduce rules to speed up the process, rather than facilitate the local development of rules. Where multi-stakeholder platforms have emerged from PMCA exercises, they have developed their own rules, often with little support from Papa Andina.

The Innovation Arena

The three phases of the PMCA correspond to the three social processes that take place in the Innovation Arena. Therefore, where the PMCA has been implemented, in Peru and Bolivia, the groups involved have advanced through the phases of social learning and social capital formation, and have engaged in joint activities focused on the development of specific commercial, technical and institutional innovations. In all the cases, participants report that the group meetings and social interactions with other market chain actors and service providers were useful to them, even before they began the process of developing specific innovations. Participants learned new things about the market chain or about technical and market potentials that they could put into practical use in their businesses. They also established personal relationships with other market chain actors or service providers that have proved useful to them in their businesses. This is one reason why stakeholder platforms have been established in some cases: to allow the diverse stakeholders to continue to interact and work together over time.

Outcomes

An important result of the collective action processes promoted by the PMCA and stakeholder platforms has been the build-up of participants' capacity for teamwork and innovation. Leadership capacity has also been developed at the level of farm communities to enable communication and interaction with market chain actors and service providers as well as institutional leadership for facili-

tating collective action and distributing roles among the market chain participants.

The groups identified new market opportunities and developed new production processes, new ways of working together and, finally, new commercial products to exploit these opportunities. This is illustrated by the case of Tikapapa in Peru, where this commercial innovation stimulated other innovation in the areas of technology development to respond to the quality criteria required by the market and institutional innovation required in the CAPAC association to provide the necessary services to these market chain actors. The results of these outcomes can be summarized as higher prices for native potatoes, increased farmers' revenues, more stable markets for native potato producers, improved image of native potatoes and increased farmer's self-esteem.

An example of indirect outcomes is the creative imitation process by which other market chain actors develop similar products based on the original creative idea that stimulated further innovation and involved new participants in the process and eventually new members to the CAPAC association. The promotion of successful innovation has also attracted the attention of policy makers and donors to the process, increasing their support for future collective action for market chain innovation.

Implications of Papa Andina's experience

Implications for general understanding of collective action

Papa Andina's work illustrates how collective action involving small farmers, market agents, researchers and other agricultural service providers can generate pro-poor market chain innovations. The collective action literature emphasizes its role among *individuals with common interests*, in managing common pool resources, reducing transaction costs, gaining scale economies, and improving the bargaining power of small farmers. The innovation literature, in contrast, highlights the importance of interactive, social learning among *individuals with different perspectives and interests*. Neither discusses the use of collective action in fostering innovation. Papa Andina provides some concrete examples of how these two fields can be bridged – how collective action involving diverse stakeholders can contribute to innovation processes that benefit small farmers. In the examples presented, participants strengthened business contacts and social networks, shared knowledge, and built up trust. As the capacity for teamwork developed, participants identified market opportunities and developed new products and marketing methods creating innovation processes that improved the market participation of smallholders on more favourable terms.

Papa Andina's work shows that diversity of participants' roles and interests is not always bad for collective action. In fact, diversity is valuable for innovation. The collective action literature commonly observes that diversity within a group impairs collective action. Papa Andina's experience confirms that diverse groups may be more difficult to establish and maintain over time, and that good facilitation is essential. But, in line with the innovation literature, diverse groups are potentially more productive in terms of social learning and innovative behaviour. Papa Andina's experience shows that a well-facilitated group, with diverse backgrounds, values and economic interests, can coalesce into a high-performance team that actively, creatively and successfully pursues the common objective of market chain innovation.

Papa Andina's work illustrates the synergies of different forms of collective action at different levels: stakeholder platforms and the PMCA have proven to be highly complementary. At the market chain level, groups have found that exploitation of new market opportunities often requires collective action at the local level, and vice versa.

In many cases, collective action has been short lived, linked to accomplishment of the initial goal. In others, it has evolved into more formal and stable multi-stakeholder associations. Much of the collective action literature seeks to identify factors that contribute to sustainable institutions. While clearly important for natural resources management, institutional sustainability is perhaps less relevant for innovation processes. Our experience highlights the dynamics of collective action – the different ways in which it has emerged and the different courses it has taken over time as social capital and leadership capacities have been built up and institutions have emerged.

Papa Andina's work highlights the initial importance of competent external facilitation and support. The collective action literature notes that many local organizations are established as a result of external interventions. However, the roles of external agents and the capacities they need are seldom carefully assessed. In collective action for market chain innovation, facilitators need to motivate business development, and at the same time foster development of social capital and leadership within the group. This often involves a delicate balance between achievement of short-term results (e.g. new products) and the development of sustainable institutions that can foster innovation processes.

Policy implications

Three broad policy implications come out of Papa Andina's experiences with collective action. First, institutional innovations in R&D (such as use of the PCMA and stakeholder platforms) can lead to technical and institutional innovations that enhance small farmer market participation. For example, as a result of the PMCA, new native potato products were launched. This stimulated the formation and strengthening of farmer organizations, which facilitated marketing and improvements in production and post-harvest practices. At the market chain level, formal associations were established, such as the Bolivian Andean Platform in La Paz and CAPAC-Peru.

Secondly, market chain innovation for indigenous agricultural products can aid in situ conservation of biodiversity. In Bolivia and Peru, commercial innovation with native potatoes has been a key element in linking small farmers to markets. Until recently, urban consumers did not appreciate the cultural value and nutritional characteristics of native potatoes. However, recent concerns for food quality and safety have stimulated demand for locally grown, organically produced foods, reflected in the number of gourmet restaurants serving dishes based on indigenous products. These trends have created new market opportunities for indigenous foods, including native potatoes. The resulting products also have export potential, because they are seen as exotic and nutritious. As Smale (2006) and others have shown, increasing farmer returns to crops with a high public value, such as native potatoes, will enhance the incentive for farmers to maintain agro-biodiversity. Applications of collective action approaches such as the PMCA may also prove useful for the conservation of other indigenous agricultural products in other settings.

Lastly, for R&D organizations to contribute to market chain innovation, they must develop their capacity to facilitate and participate constructively in collective action. Pro-poor innovation goes far beyond the traditional R&D. Implementing the PMCA requires R&D organizations to have the capacity to diagnose innovation systems and facilitate group processes involving people with diverse stakes in a commodity's production, marketing and use. Women's opportunities for participation in collective action processes like the PMCA and the potential benefits need to be addressed more systematically. To effectively facilitate such processes, R&D organizations need new skills and resources.

Retooling themselves to play these new roles is likely to pose major challenges for many R&D organizations.

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