

CROP PROTECTION PROGRAMME

Project INNOVA (extension phase)

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Final Technical Report

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Acronyms

CIAL	Local Agricultural Research Committee (Comité de Investigación Agrícola Local)
CIAT (Santa Cruz)	Centro de Investigación Agrícola Tropical, Santa Cruz, Bolivia
CIAT (Colombia)	Centro Internacional de Agricultura Tropical, Cali, Colombia
CIP	Centro Internacional de la Papa (International Potato Centre)
CIFEMA	Centre for the Research, Teaching and Extension in Agricultural Mechanisation, a department of the UMSS, previously a Swiss project (Centro de Investigación, Formación y Extensión en Mecanización Agrícola)
CPP	Crop Protection Program, DFID
DDT	Department of Technology Development (Departamento de Desarrollo Tecnológico), Ministry of Agriculture, Bolivia
DFID	Department for International Development, United Kingdom
FDTA	Foundation for Development of Applied Technology (Fundación para el Desarrollo de Tecnología Aplicada)
FIT	Fund created within SIBTA to strengthen technological Innovation (Fortalecimiento de la Innovación Tecnológica). Supported by DFID.
FOCAM	Creating Change (Fomentando Cambios), a project housed in PROINPA with CIAT/Colombia
GET	Technology Evaluation Groups (Grupos para Evaluación Tecnológica)
INNOVA	“Strengthening Technology Innovation Systems within Potato-based Agriculture in Bolivia” (“Fortalecimiento de los Sistemas de Innovación Tecnológica en la Agricultura Basada en Papa en Bolivia”)
MACA	Ministry for Campesino Affairs and Agriculture (Ministerio de Asuntos Campesinos y Agricultura)
M&E	Monitoring and Evaluation
NGO	Non governmental organisation
PAPA ANDINA	The CIP -coordinated regional Andean partnership program to promote strategic alliances for technological Innovation in Bolivia, Ecuador and Peru
PIEN	Strategic National Research Project (Proyecto de Investigación Estratégica Nacional) – Research projects within SIBTA (see also PITA)
PITA	Applied Technological Innovation Project (Proyecto de Innovación Tecnológica Aplicada) – Extension projects within SIBTA (see also PIEN)
PMCA	Participatory Market Chain Approach
PROINPA	PROINPA Foundation (Promoción e Investigación de Productos Andinos— Promotion and Research of Andean Products),
PROMETA	Proyecto de Mejoramiento de Tracción Animal (Animal Traction Improvement Project)
PROMASEL	Proyecto de Manejo Sostenible de Malezas en Laderas (Sustainable Management of Weeds on Hillsides Project)
R&D	Research and development
RNRR	Renewable Natural Resource Research Programme, DFID
SIBTA	Bolivian System for Innovation in Agricultural Technology (Sistema Boliviano de Tecnología Agrícola)
UMSS	San Simón University (Universidad Mayor de San Simón), Cochabamba
R&D	Research and development

1. Summary

INNOVA published information for farmers and actors on the potato chain, service providers, policy makers and others as pamphlets, posters reports and even recipe books. INNOVA held five workshops to teach the INNOVA methods (elaborating demand, participatory mid term reviews etc.) to INNOVA partners and service providers (98 people). These methods have been tested and adjusted in in SIBTA's extension projects (PITAs), and the FDTAs are starting to include them as normal practice in their work. Many service providers are demanding support from INNOVA to use the methods.

A participatory evaluation of two MIPITAs (model extension projects designed and carried out by INNOVA in which many of the methods being developed by INNOVA were applied) showed that farmers were basically satisfied with them, especially with the courteous attention from INNOVA technical people, and with the technologies themselves, although they made some suggestions for improving the projects. INNOVA gave two courses on market chains.

INNOVA strengthened six growers' organisations and launched several new products through the PMCA, including crisps made from native potatoes, fresh bagged potatoes, *chuño* and *tunta* (potatoes freeze dried in the high Andes) for supermarkets, and seed potatoes.

INNOVA organised its institutional partners to define guidelines for long-term research, which were taken into account by an IICA consultancy for the Ministry of Agriculture and other policy makers.

Poor farmers in 11 communities received training courses on new draught animal implements invented by INNOVA. Three shop owners received tutorials on repairing and maintaining these tools. Ten new implements were promoted, and farmers and technical people appreciated them as appropriate, state-of-the-art technology that is an alternative to the wooden plough and to tractors.

Thanks to the work of the past nine months, INNOVA is now better documented and its methods for understanding farmer demand are becoming accepted by projects, SIBTA and the Ministry of Agriculture. Native potatoes are now being grown more widely, helping preserve local varieties for the future while linking smallholder farmers into modern marketing chains. Besides the new ploughs and other metal implements at least seven other of INNOVA's technologies are being adopted by poor farmers in Bolivia. The PMCA (market chain) method created by PAPA ANDINA and used by INNOVA, is now being validated by DFID projects in Uganda.

2. Background

The work reported here builds on and takes forward the outputs of the INNOVA project in Bolivia which were written up in the final report of the first phase of INNOVA. INNOVA started in 2002 in the context of a new Bolivian system for agricultural research and extension: SIBTA. Supporting the consolidation of SIBTA is a priority for DFID/Bolivia to enable better targeted pro-poor research. In accordance with DFID policy, RNRR programmes in Bolivia work with SIBTA, and strengthen the institutions that form part of it.

SIBTA requires that agricultural research and extension be demand-driven, and developing improved tools to characterise and prioritise demand is crucial. Mechanisms developed by INNOVA effectively link supply with demand

Within SIBTA, demand has tended to be captured through one or more discrete events based on interviews with those who demand new technology. INNOVA has shown there is a need to apply various methods over time to capture explicit and implicit demands and link them with technology supply. These methods include:

Sondeos: capture demands from different wealth strata

Technology evaluation groups: farmers validate technologies in groups. These provide opportunities to show that implicit demands respond to real farmer needs and show case technology for wider adoption

Community feedback sessions: farmer groups show results to the community and get their feedback

Municipal Innovation Committees: Strengthen municipal capacities to evaluate and develop proposals for technological innovation

Participatory interventions in productive chains: Based on the Participatory Market Chain Approach (**PMCA**) captures demand from various chain actors including farmers, and builds trust and understanding to take collaborative actions for innovations, in order to respond to new market opportunities, both technology and institutional.

Taking into account the needs of SIBTA, during the first three years INNOVA worked with FOCAM to create methods to strengthen extension projects (PITAS). In the last nine months, these methods have been tested in real PITAS. The methods are elaboration of demands, participatory mid term review and participatory adjustment of proposals.

INNOVA has taken forward the outputs of several earlier RNRR project in Bolivia in potato-based cropping systems. Technologies developed under these previous projects were improved and validated by INNOVA, and many have been shown to be highly congruent with pro-poor demand and with good potential for wider adoption, and have been promoted through the INNOVA project model (MIPITA). The PMCA has effectively stimulated innovation and led to the commercial launch of two new products (crisps made from native potatoes and improved seed), with other products under development (improved quality traditionally dehydrated potato).

INNOVA is a consortium of three research organizations – the PROINPA Foundation for Research and Promotion of Andean Products (PROINPA), the Center for Research in Tropical Agriculture (CIAT), and the San Simón University (UMSS). UMSS is represented by two projects, PROMETA (animal traction) and PROMMASEL (weed control for hillsides agriculture), both of which were created with earlier support from DFID. INNOVA is managed by the PAPA ANDINA Initiative of the International Potato Centre (CIP), in Lima.

3. Project Purpose

Strengthen technical innovation systems in potato-based agriculture in Bolivia.

4. Research Activities & Outputs

4.1 Output 1: Disseminate information on technologies, methods and market chains

Output 1 is the publication of information created during INNOVA's first three years. It faced three challenges:

Edit the information and put it into accessible formats.

Improve communication with target groups.

Complement projects like PAPA ANDINA, FOCAM, FIT-9, SIBTA and the FDTAs.

Activities planned for Output 1

Activity 1.1. Reach a contractual agreement with SIBTA's Communication Department to spread the INNOVA methods.

Activity 1.2. Design communication strategies with key stakeholders (including INNOVA partners).

Activity 1.3. Monitor the diffusion of information.

Activities for Output 1

Tables 1 and 2 show the target groups and the types of material produced.

Table 1. Type of outreach material for each target group

	<i>Written material on technologies</i>	<i>Manuals, training modules</i>	<i>Market studies</i>	<i>Electronic presentations</i>	<i>Radio programs on technologies</i>	<i>Reports</i>
<i>Farmers</i>	√				√	
<i>Actors of the potato chain</i>			√			
<i>FDTAs and service providers</i>		√	√	√		
<i>Policy makers (MACA and SIBTA)</i>		√	√	√		
<i>INNOVA partners</i>		√	√			√

Table 2. How outreach material is used

	<i>Written material on technologies</i>	<i>Manuals, training modules</i>	<i>Market studies</i>	<i>Electronic presentations</i>	<i>Radio programs on technologies</i>	<i>Reports</i>
<i>To support training</i>	√	√				
<i>Mass diffusion</i>	√		√		√	
<i>Meetings and workshops</i>		√		√		
<i>Personalised "door to door" ^A</i>		√	√			
<i>On demand and as reference materials</i>		√	√			√

^A Visits with institutions in their offices to promote the new ideas.

Results of Output 1

Manuals and training modules on the INNOVA-FOCAM methods:

- Project evaluation for municipalities.
- Deepening (i.e. elaborating) demands to write project proposals
- Participatory mid-term evaluation of PITAs
- Participatory adjustment of proposals



INNOVA produced a CD with the same content as the presentations and exercises.



CD with training modules for all the methods

Pamphlets: 5 pamphlets for farmers on:

- High tillage
- Alfalfa
- Purple clover
- Intercropped forages
- Making hay to store fodder



Posters: for farmers:

- How the Andean potato weevil lives
- Andean potato weevil control
- New barley variety without awns (spikes)
- Fodder for cattle
- Weed control
- Multiple plough
- Combined plough
- Potato digger
- Reversible plough for the Altiplano



Four radio programs for farmers on grain-legume mixes for fodder.

Flyers: Eight flyers on:

- Combined plough
- Multiple plough
- Horse and donkey traction
- Soil preparation
- Tillage
- Potato diseases caused by phytoplasma
- Control of rhizoctonia in potatoes



Five papers on marketing: production, sales and consumer preferences, pre-fried frozen potatoes, *chuño* and *tunta* (potatoes freeze dried at high altitudes)



Flyer on potato quality for crisps.



Gourmet recipes for *chuño* and *tunta*.



PowerPoint presentations:

Promotion and Development of the Participatory Market Chain Approach (PMCA) given in Uganda

Course on the PMCA for INNOVA partners and SIBTA service providers.

Workshop to Identify Methods to Strengthen SIBTA.

National Meeting to Define Research and Training in Smallholder Family Ranching, organised by the Livestock Production Programme (LPP).

Workshop on Participatory Methods for a Productive Municipality, organised by the Ministry of Agriculture, the Vice Ministry of Popular Participation, FOCAM and INNOVA.



Reports

Technology fair in Kellhuiri: "What They Learned in Seven Years, We Learned in a Week".

Technology fair in Qhochimit'a: "Desperate to Experiment."

Paths of change: "Working with people to create appropriate technologies."

Two cases studies ("PMCA in Bolivia" and "Methods to articulate technology supply and demand") for the PAPA ANDINA Horizontal Evaluation Workshop

Two mid-term evaluations for the Chaco Foundation (PITA 1/03 on marketing beef and PITA 12/03 on managing range cattle).

4.2 Output 2: Commit FDTAs, service suppliers and municipal governments to use INNOVA methods

This output institutionalises the INNOVA methods within SIBTA and other users. INNOVA developed (or modified) three methods to gauge demand:

Sondeos: semi-structured interviews in communities to describe demand, by socio-economic levels

Technology fairs: new techniques are presented to communities, by the farmer-experimenters, and researchers document community reception of the innovations.

Community feedback: farmers in a CIAL or GET present the results of research to their neighbours, and suggest ways of improving the technologies.

INNOVA and its ally FOCAM developed other methods to link demand for technology with supply in PITA projects:

Elaboration of demand: interviews and surveys in communities to gather demand for a specific extension project.

Participatory adjustment of proposals: service providers return to the community with an outline of the project and modify it, per community suggestions

Participatory mid term review: community meeting to comment on the progress of the extension project and make constructive criticism.

INNOVA knew the methods worked, the challenge was to:

- Publish the results
- Train users
- Involve municipalities, FDTAs, service providers, INNOVA partners and SIBTA.

Activities planned for Output 2

Activity 2.1. Organise 2 workshops to exchange ideas and adjust the INNOVA methods with staff of 2 FDTAs and service providers

Activity 2.2. Agree with service providers and FDTAs to try the methods in PITAs

Activity 2.3 Write proposals in response to requests for proposals from the FDTAs

Activity 2.4. Give training in response to demand from the FDTAs and service providers

Activity 2.5. Support service providers using the methods

Activity 2.6. Study the adoption of INNOVA methods / technologies with FIT 9

Activity 2.7. Final evaluation of INNOVA MIPITAs using a method developed by FOCAM; not part of the original log frame, this activity was added during the project.

Activities for Output 2

Activity 2.1 & 2.4. Workshops on INNOVA methods with FDTAs and service providers

Five courses were taught on the INNOVA-FOCAM methods with: INNOVA partners (PROINPA, UMSS & CIAT), Foundations (Altiplano, Humid Tropics, Valleys & Chaco), providers (carrying out PITAs) and faculty and project leaders from UMSS. The workshops covered:

- Capturing demand
- Participatory proposal adjustment
- Mid term project review
- Feedback session (*retro-información*)
- Technology fairs
- Participatory follow up and evaluation

Courses included presentations, exercises and studies of real cases. Participants received publications on the methods and guidelines for the exercises. The courses were held at the request of INNOVA partners and twice by the Valleys FDTA with the Altiplano FDTA.

Activities 2.2 & 2.5. Agreements with service providers and FDTAs to try the INNOVA methods; support providers using them.

Contacts made during the training workshops helped to set meetings with providers and the FDTAs to discuss the methods and how to adapt them to the Foundations. There were two meetings with the Chaco, Valleys and Altiplano Foundations.

Activity 2.6. Study the adoption of INNOVA methods / technologies with FIT 9.

FIT-9 designed questionnaires for the three areas. INNOVA staff in each region agreed upon and validated the questionnaire and helped select the sample: 90% of the farmers who worked with the project and 20% of the others. FIT-9 had meetings with key informants: local leaders and early adopters of technologies. FIT-9 administered the questionnaire to the key informants, and then surveyed the other farmers with the help of the key informants and INNOVA staff.

FIT-9 and INNOVA designed and conducted a questionnaire survey to evaluate the PMCA.

Activity 2.7. Final evaluation of the INNOVA MIPITAS

FOCAM helped INNOVA hold final evaluations of two MIPITAS, one in Comarapa (commercial potato production) and another in Tiraque (forage for cattle).

Results of Output 2

Results of activities 2.1. & 2.4. Workshops on methods with FDTAs & service providers.

In four workshops in Cochabamba, Santa Cruz, La Paz and Oruro, 30 technical people were trained from 24 organisations which carry out PITAs, 19 people from UMSS projects, 36 staff of INNOVA partners, five people from local governments, eight from organisations with innovation projects, eight people from the FDTAs and two from the Ministry of Agriculture. 110 people took the courses, as shown in Table 3.

Table 3. Organisations and participants in the workshops on methods

	<i>INSTITUTIONS AND NUMBER OF PEOPLE ATTENDING</i>	<i>total</i>
<i>SERVICE PROVIDERS</i>	AGRISEC , ORS, CEDES (3), CIAPROT (2) CIDAS, CIGAC , PROLADE, DAE, ANAPO, FAN/BOLIVIA, CEDICA, DESCON, ASOVECH, CVCT, EUROGENETICA, FUNDES/ BOLIVIA, PROTECA, INCAS SRL, FBE, CITTCA, PRODEM (2), Prosuco-Marketing, Wiñay (2), Consultora Rural (2)	30
<i>UMSS</i>	FCA Y P (3), EUPG (3), AGRUCO, MEJOCUY, ESFOR, CIF (3), CEIA, CADIA, POSGRADO (2), PROLADE, CIFEMA, RRNN	19
<i>INNOVA partners</i>	PROMMASEL (3), PROMETA (2), CIAT (11), PROINPA (22)	36
<i>Local government</i>	Sub-prefecture of the Gran Chaco (4), Municipal Council of Comarapa	5
<i>Others</i>	PRESERVAR, PDAR, KURMI, Private (5)	8
<i>Grand total</i>	50 institutions or groups	98

The courses helped to:

- Teach the INNOVA methods and gather ideas from users.
- Make contacts with the FDTAs and service providers to test the methods.
- Receive requests from providers for more training.

Results of activities 2.2. & 2.5. Agreements with providers & FDTAs to try methods; support providers using them.

Several service providers and FDTAs agreed to test the methods (Table 4).

Table 4. Commitments to apply methods in PITAs

FDTA	Method	Change suggested by FDTAs	Service provider	PITA
Chaco	Participatory mid-term review (PMR)	None	AGROCINTI COSEA LTDA. AGRO XXI	Groundnut, O'Connor, Tarija Cattle, Villa Montes, Tarija Cattle, Cordillera, Santa Cruz Cattle, Cattle Owners' Federation of the Chaco
Valley	PMR	2 changes suggested ^{A, B}	CEDES	Onion, Punata, Cochabamba.
Altiplano	PMR		Wiñay	Organic quinoa Caracollo, Oruro
Altiplano	Participatory adjustment of proposals (PAP)	None	PROSUKO – MARKETING	Potato, Tihuanaco, La Paz
Valley	PAP	None	CIAPROT	Groundnut, Cochabamba and northern Potosí

^A Evaluate knowledge and practices acquired by demanders during the PITA

^B Evaluate the performance of the provider and of the FDTA from the perspective of the demanders

Some service providers on the Altiplano (PRORECA, FBE) and in the Valleys (CIAPROT) asked for help using the Elaboration of Demands to write proposals, but the deadline for proposals had already passed.

INNOVA helped several service providers use the methods (Table 5).

Table 5. Use of methods (last 9 months of INNOVA)

<i>Method</i>	<i>FDTA</i>	<i>N° PITAs</i>	<i>Service Provider</i>
Participatory mid-term review	Chaco	4	AGROCINTI, COSEA LTDA., AGRO XXI
	Valleys	1	CEDES
	Altiplano	1	Wiñay
	Altiplano	1	PROINPA
Participatory adjustment of proposals	Valleys	1	CIAPROT
Participatory adjustment of proposals	Altiplano	1	Prosuco-Marketing
Technology fair	Altiplano	1	PROINPA
Municipal evaluation committee	Evaluation of MIPITA: Potatoes for Market in Santa Cruz		CIAT/INNOVA

Results of Activity 2.6. Study the adoption of INNOVA methods / technologies with FIT 9
The technologies selected for the evaluation were:

Altiplano: diffusion of new *forages*.

High valleys: *forages* and draught animal *implements*

Low valleys: *potato IPM*.

The field work for these studies has been conducted and the data is being analysed.

Studies of the PMCA have been finished, and preliminary results have been written.

Results of Activity 2.7. Final evaluation of the INNOVA MIPITAS

Nineteen farmers from seven communities evaluated the MIPITA in Comarapa, Santa Cruz. Using FOCAM methods, the farmers gave the project an overall satisfaction rating of 85.06%. Farmers liked the MIPITA most because it was participatory (“unless there is participation, the knowledge of the agronomists, and the innovations, are worth nothing”) and they also valued their new organisations. All of the communities now had CIALS (or similar groups called GETs) and one was organised to grow certified seed potato. They were less satisfied with the technical side of the project. The contribution to yields has not been clear. Farmers made contacts to sell potato to the chip industry, but when they sold, the prices were lower than they had expected. Still, the farmers saw these as temporary setbacks, and appreciated working with INNOVA.

Twenty-eight farmers from five communities in Tiraque, Cochabamba gave their MIPITA a slightly lower rating 72.70%. They liked the project most because of what they learned from it. Some of them were pleased that they were now producing, and even selling, the seed of new fodder varieties. All 28 people said they had learned to produce new oat varieties, and most had learned to grow other forages, but they also complained that they had not learned more, or not produced more forage because the farmers themselves did not show enough interest in the project at first, and because there had not been enough seed available.

4.3. Output 3: Strengthen Capacities of Farmers, Actors on the Market Chain, and Municipal Innovation Committees, to Develop Innovation Projects

During INNOVA’s three years, the groundbreaking Participatory Market Chain Approach (EPCP) was applied in La Paz, Cochabamba and Santa Cruz. The EPCP generated commercial, technical and institutional innovations. New products were launched, including native potato crisps. Bolivian quality norms were written and published for *chuño* and *tunta* (potatoes freeze dried at high altitudes). A stakeholders’ platform was created for *chuño* and *tunta* in La Paz, and negotiations were held on native potatoes in Cochabamba.

Activities planned for Output 3

Activity 3.1. Train municipal innovation committees and farmer groups on organisation, market chains and project management.

Activity 3.2. Develop and consolidate potato businesses.

Activities for Output 3

Activity 3.1. Train municipal innovation committees and farmer groups on organisation, market chains and project management.

Two courses were given in Cochabamba on market chains and another in Santa Cruz on agricultural marketing, market research methods and designing business plans.

Activity 3.2. Develop and consolidate potato businesses.

INNOVA helped potato growers' associations forge links with the market. Organisations were strengthened, including: APROTAC, APP El Puente, APPRA, APROSEMCO, APEPA, and the Chuño-&-Tunta Platform was created.

INNOVA supported the marketing of new products: native potatoes (crisps and fresh bagged), seed potatoes and *chuño* and *tunta*.

Results for Output 3

Results of Activity 3.1. Train municipal innovation committees and farmer groups on organisation, market chains and project management.

INNOVA gave a two-day course in Cochabamba on market chains, 12-13 July 2005, to 34 people from PROINPA and other institutions. They received the proceedings on a CD.

INNOVA gave a three-day course in Santa Cruz on agricultural marketing and market chains, 7-9 November 2005, to 35 people from CIAT, PROINPA, private firms, institutions and municipal governments. Topics included how to do market studies, business plans and market chains. Participants received a proceedings CD.

Results of Activity 3.2. Develop and consolidate potato businesses.

Strengthening organisations

APROTAC. The Association of Producers of Andean Tubers in Colomi, Cochabamba, produces and sells four varieties of native potatoes to chip manufacturers in Cochabamba and to two supermarkets in Santa Cruz. With help from INNOVA, the members wrote their own mission statement and leaned participatory follow up and evaluation (SEP) with the support of CIAT/Colombia.

APROTAC acquired land for a packing shed.

PAPA ANDINA helped APROTAC buy a cell phone, to contact their customers, and helped them to have letterhead stationary made (including invoices, envelopes, receipts and inventory tally sheets). APROTAC received training in how to fill out the papers.

APP El Puente. With help from PROINPA and INNOVA, the Association of Potato Producers of El Puente, Cochabamba, sells seed potato to seed multipliers in intermediate valleys, who sell seed to farmers in lower valleys. All people interested in joining the association were invited over the radio to attend a two-day workshop where they wrote organisational and sales plans, specifying concrete tasks. A strategic plan was developed with the association that the growers are using.

APPRA. The Association of Potato Producers of Ayopaya, in San Isidro, Morochata, Cochabamba, sells native potatoes to food manufacturers and to supermarkets. INNOVA invited them over the radio to a meeting where they wrote statutes and regulations for the association. They were helped to write a constitution to start a new organisation.

APROSEMCO. The Association of Seed Producers of Comarapa includes groups of seed producers in Verdecillos and Purquina Arriba (the 'intermediate valleys') in Santa Cruz, who sell seed potatoes to growers further down. INNOVA gave training to 30 farmers on producing quality seed, selection, storage and labelling. The producers defined their association's objectives and structure.

APEPA. The Association of Ecological Producers of the Province of Aroma processes and sells *chuño* through the firm Ricafrut, under the brand name 'Chuñosa'. INNOVA and the NGO

Kurmi helped link the association with markets in La Paz. A survey on the organisation and sale of *chuño* was coordinated with NGOs.

Chuño-&-Tunta Platform. Once the Chuñosa® brand was launched, several actors formed a *chuño-&-tunta* platform in La Paz. INNOVA sponsored the first meeting, with farmers, processors, merchants, exporters and institutions. They discussed their demands, supply and priority activities and business opportunities.

Marketing support

Crisps from native potatoes. INNOVA helped APROTAC plan the planting and harvesting of native potatoes and requirements for seed and inputs. The packing shed received maintenance. Training was given to farmers on making compost and mineral sprays. PAPA ANDINA supported a study in Cochabamba of consumers' perception of Lucana brand native potato crisps. The results helped the members of APROTAC and the Lucana firm to create a business plan with a consultant.

Bags of native potatoes. A brand name was coined, Q'RicaPapa ('what delicious potatoes') to labels the two-kilo bags of native potatoes produced by APROTAC and sold on a regular basis through a supermarket and a natural foods store in Santa Cruz. A consumer study was conducted in Santa Cruz with focus groups.

Seed potato. Commercial relations were promoted between the seed producers of ORPACA and APROSEMCO, the seed multipliers of APP and their buyers in the low valleys of Comarapa and Saipina. The first Business Roundtable (*Rueda de Negocios*) was held in Verdecillos. The meeting was attended by interested representatives of the municipal government of Comarapa (which includes Verdecillos, where seed is grown and the lower communities that buy it). The Regional Seed Office (ORS) helped give courses on quality control.

Chuño and tunta. A new product was created: clean, bagged *chuño* with the Chuñosa® brand name, sold through a supermarket chain in La Paz. People from business and institutions were invited to a prestigious school of chefs, to taste gourmet dishes made from *chuño* and *tunta*.

4.4 Output 4: Contribute to the definition of guidelines for a long-term research policy

The Applied Technological Innovation Projects (PITAs) and the Strategic National Innovation Projects (PIENS) are SIBTA's main instruments for promoting technical innovation, yet they do not explicitly include strengthening of long-term research. INNOVA's member organisations have a clear mission to generate technology, and they do conduct long-term research. INNOVA's steering committee discussed how the institutions and the State could approach long-term research, and planned the following activities during INNOVA's extension phase:

Activities planned for Output 4

Activity 4.1. Document the results of previous meetings and workshops related to long-term research in Bolivia.

Activity 4.2. Form and support a working group on long-term research policies, including representatives from national research centres, and international centres with interests in Bolivia, DDT (Department of Technology Development, Ministry of Agriculture) and the CAS (*comité de acompañamiento al SIBTA*).

Activity 4.3. Support a consultancy to analyse long-term research and present the findings in a workshop.

Activities for Output 4

The start of the phase coincided with the beginning of two initiatives proposed by the Ministry of Agriculture:

- A consultancy by IICA to study the network of service providers.
- An event with national research centres, in preparation for a later meeting with international research centres to outline mutual cooperation to strengthen strategic research in Bolivia.

These initiatives were closely related to Output 4 of INNOVA's extension phase. This activity supported strategic lobbying to strengthen Bolivia's long term research capacity by the consortium (INNOVA members: PROINPA, CIAT and UMSS) with IICA consultants and policy makers in the Ministry.

Results of Activities for Output 4

INNOVA, the FIT Programme and the Ministry hired consultants to write the study "Relations between National and International Research Centres, Systematisation of Experiences to Promote Alliances". The document offers INNOVA partners, other R&D organisations and the Ministry information on the possibilities and limits of attracting international centres to strengthen long-term research in Bolivia.

INNOVA gave project partners time and space to analyse the IICA study of the service providers' network. The partners discussed the study and shared their analysis with the IICA consultants and made the following suggestions:

The initial idea of the network of SIBTA service providers (a group of organisations that offer services to SIBTA to conduct PITAS and PIENS), evolved into a network oriented to offering strategic, long-term research, with the following objectives:

- Develop basic and strategic research for the crops with which they have experience. The research should receive direct financing, not through competitive funds.
- Represent Bolivia as the formal delegation of MACA, before international agencies and forums. The delegation would assure a high quality of international representation for Bolivia as well as the fulfilment of signed agreements.

Members and organisations of the network:

- At first the network would be composed of eight members; PROINPA, CIAT, Pairumani, ANAPO and four universities. IICA chose these organisations because of their experience and solvency, based on information acquired during the consultancy.
- It was proposed that the network have a president, a vice-president, and a coordinator. The latter would be a hired official, and would not belong to any of the organisations that make up the network. He or she would be based in MACA to act as liaison between the Ministry and the network.

4.5 Output 5: Train agronomists and farmers to use draught-animal equipment

During its three years, INNOVA finished designing several farm implements. After three years of hard work testing and disseminating the technologies in the pilot areas there was a need to reach new areas. Some institutions like ANAPO, ASEC and others in Santa Cruz wanted to see the technologies. INNOVA received demands it did not have time to address, to design implements for onion (furrowing, planting, weeding, selecting) in the high valleys; for a quinoa planter and a harvester in the Altiplano; cultivators, planters and harvesters for groundnut.

This demand from NGOs, municipalities, universities, and farmers' unions (*sindicatos*) led to the nine month extension for training in animal-drawn implements.

Activities planned for Output 5

Activity 5.1 Animal-drawn equipment for tillage, harvest, and post-harvest are promoted through 14 demonstration days and 14 training courses in nine areas in three agro-ecological zones of Bolivia (Altiplano, high and low valleys).

Activity 5.2 Poor farmers from three eco-regions in Bolivia and extensionists from other institutions learn to train horses and donkeys to pull implements during 9 training courses.

Activity 5.3 Owners of rural machine shops are taught to repair and maintain draught-animal equipment and provide services to poor farmers in three eco-regions of Bolivia through nine training courses and 18 advisory visits.

Activities for Output 5

Activities 5.1 & 5.2 Draught animal equipment is promoted in 14 courses in nine areas in three agro-ecological zones. Nine courses on horses and donkeys are given to poor farmers and to extensionists.

Starting in August, courses were planned with institutions like the municipal government of Vallegrande, CIAT of Santa Cruz, PROINPA in La Paz, The University in Sucre, Agrosurco in Tarija, The Universities of San Andrés in La Paz, Siglo XX, The Loyola Cultural Action Foundation (ACLO) of Sucre and PROMMASEL in Cochabamba. The institutions set the dates between the end of October and the end of December, the most appropriate time of year.

The courses were to be accompanied by five posters for farmers and five flyers for agronomists, written between July and September with PROINPA in Cochabamba and sent to CIAT in Santa Cruz for layout and publication. PROINPA and CIAT helped PROMETA organise the events.

Activity 5.3 Owners of machine shops are trained to repair equipment during nine courses and 18 advisory visits.

During the courses, contacts were made with local mechanics who were encouraged to offer equipment repair and maintenance services. Técnicos from CIFEMA-PROMETA visited machine shops in towns near where the courses were held. During these visits PROMETA evaluated the shops' equipment and taught the mechanics to repair and maintain the new implements.

Results for Output 5

Results of Activities 5.1 & 5.2 Draught animal equipment is promoted in 14 courses in nine areas in three agro-ecological zones. Nine courses on horses and donkeys are given to poor farmers and to extensionists.

The 11 training sessions were divided into two parts: a talk on uses and advantages of the implements, and on training horses and donkeys for traction. Second, a demonstration of the equipment in farmers' fields.

- 4 in the low valleys of Santa Cruz (Ovejería, Guadalupe, Siberia and Mairana)
- 4 on the Altiplano of La Paz (Chiarumani, Chiaraque, Chirapaca and Kerani)
- 3 in two municipalities of Chuquisaca: Campo Redondo, Alcalá and Limabamba.

Each event was attended by more than the 20 people anticipated, and 450 received the training. See Table 6. After the talks and demonstrations, equipment was consigned to farmer representatives (associations, *sindicatos*, and cooperatives); according to the number of participants and the interest they showed. See Table 7.

Trainers were trained in Vallegrande: 10 técnicos from the Training Institute of the East (ICO), the sub-prefecture, and the private firm Agrosur. The events were well attended and

the participants expressed satisfaction and an interest in acquiring the implements. The farmers' representatives asked for more events, because the implements are well adjusted to their conditions and their animals.

Table 6. Communities where courses were given to farmers

Municipality	Community	N° of farmers	Date	N° of implements ^A
Vallegrande	Ovejería	18	22 October	10
Vallegrande	Liberia	20	24 October	3
Mairana	Mairana	64	26 October	6
Vallegrande	Guadalupe	60	28 October	5
Patacamaya	Chiarumani	30	8 November	2
Patacamaya	Chiaraque	60	9 November	5
Batallas	Chirapaca	60	10 November	0
Batallas	Kerani	30	11 November	3
Padilla	Campo Redondo	85	15 November	4
Alcalá	Alcalá	45	16 November	2
Alcalá	Alcalá	30	17 November	2
Alcalá	Limabamba	25	18 November	2

^A The implements were left in the communities for promotional purposes

The implements were left with community representatives, with the firm commitment that community members would test them.

Table 7. Types of implements left with communities for promotional purposes

<i>implement</i>	Valle-grande	Guada-lupe	Mairana	Siberia	Chia-rumani	Chia-raque	Kerani	Campo Redondo	Alcalá	Lima-bamba	Total
Reversible plough with wings	2	1	2	1							6
Combination plough high tillage	4	2	1								7
Combination plough				2				1	2		5
Weeder	1										1
PROMETA reversible plough	1	1	1								3
Multiple plough	1		1			2	1				5
High lift harness	1		1								2
Altiplano reversible plough					2	3	2				7
Horse/donkey plough		1						1			2
Small reversible plough								2	2	2	6
Total	10	5	6	3	2	5	3	4	4	2	44

Results of Activity 5.3 Owners of machine shops are trained to repair equipment during nine courses and 18 advisory visits.

Three local mechanics have been trained in the art of steel and iron-working to repair and maintain the draught-animal equipment. The advisory visits have not been made yet because the equipment is still too new to need maintenance or repair.

5. Contribution of Outputs to developmental impact

5.1 Contribution of the results to Outputs 1 through 5

Contribution of the results to Output 1: Disseminate information on technologies, methods and market chains

Clear, relevant information is available in formats for various audiences, providing better **visibility** and **positioning** of INNOVA outputs.

By 2005 the FDTAs, Ministry and service providers were more open more open to including INNOVA methodologies.

The materials for farmers are helpful in training events; they reinforce extensionists' credibility and self-confidence and motivate farmers.

The market studies are in demand by the actors of the potato chain.

Writing manuals helped to clarify concepts, define where the methods apply and simplify the steps. Writing is part of creating a method.

Building capacity of INNOVA partners' staff

The INNOVA partners had already written extension material, but INNOVA encouraged collaboration between agronomists and communicators, who learned from each other.

INNOVA encouraged the partners to write together and promoted writers' workshops, which the partners now see as valuable for the future.

Contribution of the results to Output 2: Commit FDTAs, service suppliers and municipal governments to use INNOVA methods

The Foundations use the methods. The Valley and Altiplano FDTAs suggested incorporating parts of their M&E system into the participatory mid-term review. Each FDTA will evaluate the benefits of the method with these changes.

More progress was made with the Chaco FDTA. The staff of INNOVA, FOCAM and the FDTA tested the participatory mid term review while giving training and it has now been incorporated into the Chaco Foundation's evaluation system, now used by the Foundation's supervisors with the PITAs.



The Altiplano Foundation did not suggest any changes in the Participatory Proposal Adjustment method. They thought it was interesting and are waiting to see how useful it is. They facilitated a meeting with a service provider who was willing to try it.

In the Valleys Foundation a service provider who had taken the courses suggested trying the Participatory Proposal Adjustment. The experience should be of interest to the foundation.

PROINPA is a service provider, as well as a member of INNOVA. PROINPA decided to include all the methods even in its projects which are not part of INNOVA and invited staff members who work with INNOVA and FOCAM to give a course on the methods to project managers.

The manager of the PITA with 16 communities on the Altiplano noted:

“The elaboration of demands let us get to know farmers’ real problems while writing a proposal, and to change some implicit demands into explicit ones.”

“The technology fair showed the technologies offered by the PITA and by INNOVA partners. During the fair questionnaires were given to about 100 farmers, to see how they perceived the technologies. This helped to rank the new technologies and learn local criteria. This method adds value to what would otherwise be just a field day.”

“A mid term review was done at two levels: first with the leaders of the 16 communities that work with the PITA, and then with each community. The method takes time, but the farmers were able to use it to evaluate the PITA, prioritise interesting topics and propose others to include in the future. They pointed out shortcomings in the training and made a self-criticism about their own attitude in the courses. This information helped adjust the PITA.”



Altiplano farmer Raúl Condori speaks convincingly about new barley varieties at the 2005 technology fair, while the farmers behind him take notes



Municipal Committee in Comarapa has the ‘teeth’ to evaluate projects

Municipalities. INNOVA’s ‘committee with teeth’ was later given the more prosaic name “municipal project evaluation committee”. After local elections and changes in the municipal government, the committee was reactivated in Comarapa, Santa Cruz, to share experiences of the previous committee and to evaluate the MIPITA led by CIAT as part of INNOVA.

After trying the method, the committee asked for support from INNOVA to evaluate a drinking water project in Comarapa. In the future the committee will write statutes and regulations.

Farmers: The participatory final evaluation, designed with FOCAM, has had its maiden voyage. The reports on two cases suggest that the method does allow farmers to express honest opinions about a PITA, and that it could be adapted by other institutions in the future.

Contribution of the results to Output 3: Strengthen Capacities of Farmers, Market Chain Actors and Municipal Innovation Committees to Develop Innovation Projects

Evolution of native potato growing. The study of the PMCA by FIT-9 showed that three years ago the members of APROTAC grew less native potatoes (planting 38 kg of seed on average) than the non-members, who planted an average of 82 kilograms. Now both groups plant much more native potato. The members have gone from planting 38 kg to 597 kg of seed, while the non-members have gone from planting 82 kg to 263 kg. Before 2002, before INNOVA, they grew native potatoes to eat, and sold little.

Sales of native potatoes. Before 2002 all of the native potato growers sold to wholesale merchants (‘ranqeras’), to retailers or directly to consumers in local fairs. Half of the members of APROTAC did not sell their native potatoes at all.

PROINPA and APROTAC opened new avenues of sale, especially for the members, who now sell not only to *ranqeras*, retailers or in fairs, but also to food manufacturers and to

supermarkets. The institutions contributed to modernizing the native potato marketing system, linking farmers to manufacturers to processors. The members of APROTAC have gone from selling an average of 333 kilos of native potatoes in 2002, to an average in 2005 of 1,683 kilos per year. But some sell more than others. While one farmer increased sales from 200 to 300 kilos, another went from 500 kilos to 3,500.

Potato producers' organisations were formed or consolidated, including APROTAC, APP El Puente, APPRA, APEPA and APROSEMCO, and the *chuño* and *tunta* platform in La Paz. They are articulated with the market: responding to demand and firmly linked with the other actors. The organisations really do sell their products.

The new market channels, such as food manufacturers and supermarkets, require innovations in technology. Now farmers must select their potatoes, pack and label them. The new routes also modernise business relationships with customers: contracts, agreements, written orders etc., even calls on cell phones to close deals.

The commercial flow of seed potato has been streamlined, with an efficient relationship between certified seed growers in the high country, passing through multipliers in intermediate areas to ware potato growers in lower areas.

Selecting and bagging *chuño* improves its packaging, satisfying the requirements of even the fussiest supermarkets and allowing sales at higher prices.

Benefits of the PMCA to farmers:

- Enter new market segments and earn higher prices.
- Use better technologies, improving quality and yields.
- Are more aware of the themes of ecology and agrobiodiversity conservation.
- Take a renewed interest in native products.
- And have relations of trust with other members of the market chain.

Benefits of the PMCA to other members of the market chain

- Find business opportunities in native products
- Receive a better product, at competitive prices.
- Firms and merchants communicate directly about the quality they require.
- They hold meetings to reach mutually beneficial agreements.
- Share experiences and suggestions, and learn from each other.

Contributions of the results to Output 4: Contribute to the definition of guidelines for a long-term research policy

INNOVA's contribution has been to encourage the members of the project to reach a common position to contribute towards the Ministry's efforts to strengthen long-term research. It is hoped that the suggestions described in section 4.4 will be included in the final version of the IICA report, and will help the Ministry of Agriculture define research policies.

Contribution of the results to Output 5: Train agronomists and farmers to use draught-animal equipment

Before the courses, the farmers saw only two alternatives for tillage: the tractor for those who could afford it and the wooden plough for everyone else. But during the courses they found an appropriate technology, a late-model plough adjusted to their own conditions. Oddly enough, this simplistic "tractor vs. wooden plough" perception was shared by the agronomists from the institutions that participated in the training, and their reaction was the same as that of the farmers.

The técnicos from PROMETA, carrying their loads of implements, are seen as technical change agents in the areas where the courses were given. In neighbouring communities, farmers have said things like “Don’t give us the talk, our neighbours have already told us all about it. Let’s just start ploughing the field.”

The women farmers were also enthusiastic during the demonstrations, and said things like “With this plough even I can work (the land) and I want to.”

Six more communities have sent written requests to CIFEMA–PROMETA for training and three institutions have demanded advice on introducing the technologies. They want to sign agreements to establish future projects. Thanks to these last nine months the técnicos of PROMETA know how to promote their technologies in new areas, even better than they did during the first years of the project.

5.2 Contribution of the results to wider development goals

Technology for the poor. In May, 2005 the staff of INNOVA met to analyse the technical results of the project. Of 10 major technologies (several of which are actually sets of several techniques), eight are being adopted by poor Bolivian farmers (Table 8). Adoption data is still patchy, but qualitatively, the farmers like the technologies, which have potential for adoption over much of Bolivia. INNOVA held a meeting in May called *Caminos al Cambio* (Paths of Change), to analyse how technologies had changed and how the methods helped. The CIALS, GETs, technology fairs, feedback sessions and MIPITAS were all useful in demand-led research with poor, rural communities (Table 8). This analysis will be helpful for other development workers in other parts of the world who are also concerned with appropriate technical change for smallholder farmers. The results have been written in Spanish in the *Caminos al Cambio* proceedings, in a case study for PAPA ANDINA as part of the end of phase compendium report, and a paper for the INNOVA systematization (a 30 page paper now being finished by Jeff Bentley and several other people in INNOVA. An English version is being written for publication in a peer-reviewed journal. All of these will be published in an anthology by CIP/ PAPA ANDINA.

Table 8: Changes in technologies and the methods that influenced the change

<i>Technology</i>	<i>How it changed</i>	<i>Methods that helped</i>
1. improved fallow	Plough the soil, plant in good soil and with oats instead of Festuca. Irrigate and fertilise	technology fair, GET, feedback
2. grains-plus-legumes	Farmers like it, if they can produce vetch seed, which some have been able to do in the higher, colder areas of Cochabamba	GET, feedback, technology fair, MIPITA
3. new fodders	Included with technologies 1, 2 and 4	technology fair, GET, CIAL, MIPITA
4 Phalaris grass	Planted in whole fields on the Altiplano. People in the valleys are still adopting it	feedback, GET, technology fair
5. chicken manure for nematodes	Place the manure in the bottom of the furrow instead of broadcasting it, to keep it out of one's eyes	CIAL
6. potato IPM	Soap and detergent to control insect vectors. Fungicides and insecticides are still under study. Control of moths in stores created from scratch	GET, CIAL, MIPITA, technology fair
7. herbicide for purple nut sedge	Abandoned	technology fair
8. improved tillage	Invented high tillage, and a new plough to do it with	technology fair GET, MIPITA, CIAL
9. adoption of implements	Extended implements, but also invented the multiple mountain plough	back-&-forth, GET, CIAL, technology fair, MIPITA
10. home remedies for cows	Abandoned	technology fair, short courses in communities

While the classic INNOVA methods (sondeo, technology fair, feedback session etc.) should be useful for research-&-development in other countries and with other technologies, they have not so far found other users in Bolivia. Partly this is because the new system that is emerging in Bolivia is based on the PITA, a rather conventional form of face-to-face extension with agronomists working through organised farmers' groups (e.g. onion growers' associations). PITAs are for extension, while the classic INNOVA methods were for technology research. On the other hand, the later INNOVA methods, designed with FOCAM specifically for PITAs are being institutionalised in the SIBTA system.

Business, not as usual. The PMCA generated completely new ways of working, for INNOVA, for PAPA ANDINA and its partners. The idea started in Peru, but as INNOVA brought it to Bolivia, and others used it in Ecuador, the PMCA became an Andean experience, which INNOVA took to Uganda on a DFID project with PRAPACE (Regional Program for Potato Breeding in Central Africa), NARO (National Agricultural Research Organisation—Uganda) and commodity buyers. Working with the whole market chain contributes to SIBTA's goal of having research respond to the interaction of various actors: not just the farmer, but the processor, the small-scale merchant and others. This interaction demands innovations not just in technology, but in commerce and in the 'rules of the game.' And the PMCA helps do that. It encourages innovation in the whole system. INNOVA's experience showed the market opportunity approach with smallholders can be combined with rural development. Since the PMCA works with the other people who deal with the farmers, it has the potential to move research and development closer together, because if the agenda for innovation emerges from several members of the chain, who trust each other, the research and development agencies can fulfil their role knowing that they are working for people who need this innovation. These are important lessons.

5.3 Views of the future

Output 1: Disseminate information on technologies, methods and market chains

All of this information is on the PROINPA, and it will soon be loaded onto the CIAT/Santa Cruz and the PAPA ANDINA web pages, where it will continue to be available to the public after INNOVA ends.

Several libraries now have these publications, and all of this information will be used and disseminated through future projects, by the member organisations and by CIP.

Output 2: Commit FDTAs, service suppliers and municipal governments to use INNOVA methods

Unless a future project takes stewardship for these methods, they could be lost. Someone must continue to promote them and give training. A three year project is not enough to institutionalise these methods. A proposal has been sent to DFID to consolidate and expand the Innova outputs in Bolivia, creating the capacities for others to use them in the Andean region and in Africa.

Output 3: Strengthen Capacities of Farmers, Market Chain Actors and Municipal Innovation Committees to Develop Innovation Projects

The farmers and other actors need continued support, which will be provided under a future project through CIP, with funding from the government of New Zealand.

Output 5: Train agronomists and farmers to use draught-animal equipment

Continued extension of the implements depends on PROMETA and its home department, CIFEMA, which has developed and sold animal-drawn metal implements since the 1970s. Selling the tools recovers some costs, which helps to keep PROMETA alive. CIFEMA's long-term commitment to creating and promoting farm implements suggests that they will continue these efforts in the future.

Biometricians Signature

The projects named biometrician must sign off the Final Technical Report before it is submitted to CPP. This can either be done by the projects named biometrician signing in the space provided below, or by a letter or email from the named biometrician accompanying the Final Technical Report submitted to CPP. (Please note that NR International reserves the right to retain the final quarter's payment pending NR International's receipt and approval of the Final Technical Report, duly signed by the project's biometrician)

Not Applicable