

# High-value products and small-farmer economies: concepts, issues and research needs in the Andes

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## 1. Introduction

The Andes region is among the poorest in the world; around 70 to 80 percent of its rural population live under poverty thresholds, the most outstanding case being Bolivia, followed closely by Peru and Ecuador (CEPAL, 2004). It has been recognized that incidence of poverty is greatest in rural areas and is severest among small and marginal farmers (SFs), who typically have limited access to the resources required for engaging in profitable agricultural systems (Barghouti *et al.*, 2004).

Despite the structural reforms undertaken by most Andean countries, poverty still pervades the region. In fact some authors contend that there have even been negative effects of these reforms on rural SFs whose livelihoods depend on agricultural activities, particularly those reforms related to the promotion of commodity exports (IFAD, 2004). This means that many SFs may actually be worse off after their governments undertook macroeconomic reforms, precisely to get them out of the so-called poverty trap.

Interestingly, rather than complaining about the pervasive effects of neoliberal policies on their lives, many SFs in the Andean region have found alternatives for improving their economies in this new context. There are several successful cases where SFs, even in asset-restricted contexts, have linked to export markets, developed new products or engaged in joint ventures with private enterprises (Céspedes and Paz, 2005). Although each of these cases is unique, all of them have had some kind of diversification process that transformed some or all of their economic outcomes into what are being called high-value agricultural products (HVAPs) (IFAD, 2004).

There has been an increased interest in high-value products (HVPs), which may represent an interesting opportunity for SFs, the development community and policy-makers throughout the region, for promoting diversified livelihoods rather than insisting on pushing SFs into semi-industrial, monoproducer economic systems. However, there are several issues that need to be dealt with:

- ⇒ What are HVPs? There is no common understanding about the characteristics that define a “high-value” product. There are solid examples of products that are known to have high value, but a thorough analysis shows us that they cannot be grouped into the traditional definition of HVPs.<sup>2</sup> They are not horticultural products, and they did not have value-added processing; e.g. quinoa, a grain that is considered a staple food in local markets. Moreover, there are several horticultural products (e.g. tomatoes and bananas) that behave as commodities.
- ⇒ There is no clear understanding about how HVPs fit into SFs’ economies. Clearly, diversifying from traditional staple products into HVPs is not a straightforward process for most SFs (otherwise HVPs would have been widely adopted by all SFs in the region and this is not the case). Most importantly, it is not clear how this process can be “induced” by development initiatives.

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<sup>2</sup> Traditional definitions of HVPs are based on the assumption that (i) a high-value product is one that undertook some kind of value-added process — mainly agro-industrial processing or packaging — which raised its value considerably; or (ii) products that have a high return per unit or a high return per input, usually land. In either case horticultural products and spices are defined as HVPs and grains are defined as commodities.

⇒ Is the institutional research context in the Andes prepared to help SFs diversify into HVPs? What are the main issues? What are the current research priorities?

This paper is an inquiry into these last issues; but rather than propose answers, we aim at drawing researchers' and practitioners' attention to the details of these issues in order to further the knowledge on how HVPs may serve as a mean for improving the lives of the SFs' in the Andean region.

## **2. What are high-value products?**

The so-called HVPs have created global interest among researchers and practitioners in the development community, which contrasts with the inadequate financial aid from international development agencies and research centres over the past decades (Weinberger and Lumpkin, 2005). If we have learned something from the last 25 years of agricultural research, it is that narrow definitions lead to narrow outcomes (Hazell and Haddad, 2001). Although we need to have a clear understanding of what is and what is not an HVP, the definition has to be made in the broadest sense possible.

Now we know that consumers define the value of products, but where does the value come from? A product is valuable if it has a high demand and is seldom offered. Thus at least some of a product's value comes from its scarcity in the market. A scarce product has one distinctive characteristic: It is mainly based on a rare and often unique asset that limits its availability in the market. A diamond necklace derives its value not from the design, but from the inherent scarcity of diamonds in the world. Scarce resources can also be intangible in nature: a Faberge egg derives its value not from the eggshell itself or from the paint used on it, but from its exquisite craftsmanship and the fact that the craftsmen that had the ability to make them all passed away a long time ago.

Products that have a perceived low-value for consumers and low asset uniqueness fall into a commodity category: homogeneous products that have had little or no additional processing. Commodity production typically requires fairly large extensions of land and relatively large markets to derive positive returns on assets. Commodities fit well into semi-industrial or industrial agricultural systems where value stems from economies of scale. Grains and other staple products are good examples of commodities, but some horticultural products may also qualify in this category. On the opposite side is the HVP category, which is characterized by products that have high-value perceptions among consumers and high asset uniqueness. HVPs do not need scale to be profitable as they are often targeted towards niche markets. They are especially well fitted into micro- and small-scale agricultural systems. Some spices, organic products and biodiversity-based products are good examples; but there are also grains such as quinoa that can also be considered HVPs.

Products that have either low consumer perception and high asset specificity or vice versa fall into transitory categories because they might become either commodities or HVPs. This is what Porter (1990) defines as products that are "stuck in the middle". Changes in product position in this category depend largely on changes in consumer perceptions, which may be dynamic when compared with changes in asset uniqueness, which tend to be stable over

long periods of time. Thus products that have a high value perception by consumers but are not based on any distinctive asset will eventually slide into a commodity market structure; hence industrial agricultural systems can produce it more efficiently, increasing its availability in the market and thereby reducing its value. However, there are several exceptions such as “buy local” campaigns that appeal to culturally embedded assets to redefine, refresh or even create value perception among consumers. As a matter of fact; new markets can be developed for these products.

### **2.1 Consumers’ perceptions of HVPs**

Global trends such as urbanization, international migration, higher average income in developed countries, increased interest in health, information access, increasingly adventurous consumption habits and other trends have changed the way consumers perceive “value” in agricultural products (Barghouti *et al.*, 2004). International trade of fruits and vegetables has increased fivefold in the last 40 years (Weinberger and Lumpkin, 2005). We can conclude that consumers value HVPs more and more, but what are they specifically looking for in them?

- *Healthy products* (Barghouti *et al.*, 2004; Riveros, 2005). Consumers nowadays are willing to spend “an extra buck” in return for products that promise to be healthy. This may be related to consumers’ perception that nontraditional horticultural products may contribute to attaining a more balanced diet. Recent concerns about heart disease related to high fat and high carbohydrate intakes have also raised awareness about the importance of consuming fruits and vegetables rich in vitamins, antioxidants and fibre.
- *Rare products* (Barghouti *et al.*, 2004; Riveros, 2005). Certain segments of consumers, particularly from developed countries, have become interested in consuming exotic rare products, such as *pitahaya or pitaya (Cereus x tringularis)*, similar to prickly pear fruit grown in Mexico. This kind of adventurous consumption is being boosted by changing demographics and the increasing interest in remote cultures and places, promoted by mass media documentary programs and increased global travelling.
- *Safe products* (Riveros, 2005). Products’ safety attributes are also valued highly by consumers. Products with contaminants (e.g. pesticide residues, rat faeces, and fungal aflatoxins), toxic residues or that pose biosafety and other environmental risks are being refused by consumers in both developed and developing countries. This trend appears to derive in part from current disease outbreaks such as mad cow’s disease (Barghouti *et al.*, 2004) and stories of intoxications due to residues in food and other products.
- *Environmentally and culturally friendly products* (Riveros, 2005). Consumers are now interested not only in the products’ attributes but also in the way in which they are produced. HVPs that may have been produced in sustainable production systems that assure environment protection, biodiversity conservation, etc. and are labelled to reflect this are receiving higher market prices in fast-growing consumers’ segments. This is the case of organic and biological products. The same trend can be seen for products that can certify that quality-assurance methods have been applied in production, marketing and management of production processes (e.g. products that have ISO conformance certification).

### **2.2 Asset uniqueness**

The global supply of HVPs, particularly nontraditional fruits, vegetables and cut flowers, has increased dramatically in recent years (Weinberger and Lumpkin, 2005). Our line of reasoning is that at least some of this growth can be explained by the increased production of products with unique assets that give them distinctive attributes. What are these assets in the Andean region?

- *Ecogeographic and seasonal location.* Some HVPs can only be produced in certain locations that have a special climate or altitude, or that have unique access to the market. This is the case of gourmet coffee in Colombia and more recently in Bolivia. Location is also related to preferential access to local markets; several HVPs have nearby markets that have been held captive by locally produced products; e.g. organic tomatoes grown in greenhouses near the Cancun resort zone in Mexico.
- *Biodiversity, traditional knowledge and culturally related assets.* Products based on biodiversity assets such as genetic resources, forest products (honey, mushrooms, orchids...) and particular varieties of endogenous species of agricultural products are outstanding examples of asset uniqueness. Asset uniqueness can also be seen in products that are based on ancient know-how or have strong ties to local and traditional cultures. A good example is the *maca* pill, a pharmaceutical product sold in Canada as a dietary supplement, made from a tuber grown in the Andes and domesticated by ancient cultures.

### **3. HVPs and SF economies**

#### **3.1. The SF defined**

SFs have binding asset restrictions that limit their possibility of generating economies of scale that would enhance returns to their assets (Siegel, 2005). The most important restriction that SFs face is access to land and technology to increase productivity (Hazell and Haddad, 2001). Small farmers have other constraints that limit their access to and use of other, often overlooked, assets such as market information, access to adequate financial credit and commercial connections with profitable markets (Barghouti *et al.*, 2004).

Although not all SFs are poor, all rural poor are SFs or rely on micro- or small agricultural production systems to survive. Typically SF populations in a community can be placed in three groups, depending on their level of asset restriction (Céspedes and Paz, 2005):

- The “rich” SFs who have managed to allocate their assets in the most productive economic positions and, taking into account their specific context limitations and risks, have managed to maintain their way of life. This group usually has yearly earnings that exceed their basic economic needs and have important levels of capitalization such as vehicles, a good house and relatively modern technology such as tractors. They also tend to have some relations with local financial systems.
- The “poor” SFs who, due to increased asset restrictions and more exposure to context risk, strive year after year to survive. These SFs relate strongly to global poverty descriptors. They typically live on a few dollars per day, and their yearly earnings are just enough to cover their basic economic needs.

- The “very poor” SFs who have mammoth asset restrictions and are exposed to negative context shocks. They usually have little or no land of their own and work part-time for other landowners. This group lives way under poverty thresholds and their economic product does not cover their yearly needs. They relate strongly to the concept of “poorest of the poor”.

The SF population structure is important because the very poor are often the target for development initiatives that aim at improving their situation; e.g. increasing their access to markets. In the face of enormous asset restrictions, this group cannot benefit from such initiatives. On the other hand, the rich are also seen as a target population for development projects that seek economic leaders to act as economic drivers in poor communities. These initiatives have also had pitfalls and high opportunity costs so they are not usually interested in engaging in traditional development initiatives (Céspedes and Paz, 2005).

### 3.2 Issues about HVPs for SFs

Small farmers can benefit from introducing HVPs into their economic systems. Benefits range from increased profits to the creation of employment. The fact that (i) this kind of product is usually more lucrative than staple crops and (ii) economies of scale are not critical to obtain high returns on critical assets such as land (Weinberger and Lumpkin, 2005) demonstrates the validity of the latter assertion. Nevertheless, at least three main issues need to be taken into account:

- Not all HVPs are real opportunities for SFs; hence not all perform well in asset-restricted environments. Several HVPs function only in environments where several assets such as paved roads, access to profitable markets and to irrigated water sources are available in both quality and quantity. HVPs that represent real opportunities must fit into asset-restricted systems. Product profitability may be high under ideal conditions, but low under asset-restricted conditions. HVPs may not be able to compete with traditional alternatives when considering the transactional cost of change. Key questions that have to be addressed are:
  - ⇒ Does the product have high-quality standards that can be met within current and future asset restrictions?
  - ⇒ Does the production process demand short-term financial input? Does it demand high technology?
  - ⇒ Is it profitable enough to compensate for the costs of change?
- The integration of HVPs into SF economic systems in the Andean region is not a straightforward process. It has to be seen as a *diversification process*, where substantial changes are made in the underlying characteristics of the farm system (Barghouti *et al.*, 2004). This process is complex in nature because the SFs must respond to new, often uncertain opportunities that demand improvements in quality and quantity of outputs; they have to reallocate valuable assets to new uses, a process that often increases the short-term risk in their systems; and above all, they have to undertake substantial behavioural changes in their livelihood strategies. Diversification usually demands financial resources that are seldom available to SFs. Moreover, the positive outcomes of such changes are not seen in the short term so SF systems may face a stress period that can lead to abandonment of the process. Some key questions that need to be solved in this respect are:

- ⇒ Will the diversified product be a core or a side business in the system? What kind of synergistic/antagonistic effects can be expected?
- ⇒ Will it add liquidity to the system or raise capital requirements?
- ⇒ Will its production fit into SFs' economic reasoning, or will it demand substantial behavioural changes?
- ⇒ Will overall system outcomes improve?
- ⇒ Will the SFs capture actual outcomes of diversification or will benefits be upstream in the agrifood chain?
- HVPs usually need specific local, national or even regional institutional organizational conditions that are not readily available in the Andean region. Developing-country SFs are largely immersed in ill-structured markets, have a few weak organizations, and face substantial institutional restrictions. Consequently, basic and advanced services such as financing and marketing are not available for them (North, 1990; Dorward, 2003). This is an important issue that remains to be addressed by researchers and development practitioners interested in promoting the incorporation of HVPs into SFs' systems. Key questions to be addressed:
  - ⇒ What kind of institutional and organizational improvements need to be made in order to generate basic conditions in which HVPs can perform well?
  - ⇒ Do actual policy reforms promote or hinder the development of SF initiatives related to the production of HVPs?
  - ⇒ How effective and efficient are the efforts of making available critical services for SFs? How long will it take?

Comment: Not in refs.

Despite the foregoing issues, there are several success cases in which HVPs have been adopted successfully by SF initiatives. The following is an example from Bolivia.

#### **4. Oregano in Bolivia, an example of SFs engaging in HVP business<sup>3</sup>**

Bolivia is known for having a spicy cuisine. The use of herbs such as oregano is common among people in both urban and rural communities. However, the national spice market has never been a quality-led market; hence consumers' and producers' quality standards have remained sluggish. Consequently oregano production was characterized as a backyard crop, grown in very marginal plots with no irrigation, cultural practices or post-harvest attention.

The traditional product is dried oregano leaves, which usually have black spots due to oxidation during rustic sun-drying processes, are contaminated by dust and often have rat faeces and other disease-carrying agents. Oregano can lose at least 70 percent of its flavour and consequently its value if post-harvest processes are not carried out properly. This fact did not bother the producer or the consumers, who simply did not care. Thus oregano production was never seen as a business; rather it was a good way to put small marginal plots into production.

In the late nineties consultants from SOCODEVI (Cooperative Society for International Development), a Canadian NGO linked to the Canadian Union of Cooperatives, arrived in the central valleys of Chuquisaca as part of an international development programme. Their

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<sup>3</sup> Based on Céspedes and Paz (2005).

objective was to help AGROCENTRAL (Central Office of Agricultural Cooperatives in Chuquisaca) engage in profitable business, develop solid cooperative-based services for SFs, and help them improve their income. Experts were hired to identify market opportunities suited to harsh, asset-restricted, small-scale farming. They concluded that spices such as oregano were the best options; and they also recommended the use of oregano varieties well adapted to marginal plots.

SOCODEVI promoted oregano cultivation aggressively among SFs, but their results were marginal. The market problem limited interest among SFs so SOCODEVI explored markets for oregano. Although some international wholesalers expressed interest in buying oregano, the Chuquisaca product did not meet quality standards, and they did not produce enough to meet the wholesalers' volume requirements. Thus the oregano business did not prosper, with the obvious frustration of all concerned. They then asked the MAPA (Market Access for Poverty Alleviation) project for help. This initiative helps SFs access profitable markets. The MAPA team concluded that:

- ⇒ Oregano grown in Chuquisaca was well adapted to harsh agro-ecological conditions, but its quality (lacked flavour and aroma) was not suitable for the international oregano market.
- ⇒ Small farmers were not using adequate production, post-harvest and processing techniques.
- ⇒ Market demand was not a problem; in fact, oregano represented a very good business opportunity.
- ⇒ Harvesting and drying processes needed to be re-structured radically to function in a business-oriented manner.

SOCODEVI then teamed up with the MAPA project and AGROCENTRAL, initiating a long-term aggressive programme that challenged the traditional way development initiatives in Bolivia approached this kind of situation. At first they did an informal analysis of context restrictions, organizational and institutional conditions, and business structure requirements. They concluded that the missing link was that SF cooperatives lacked business capabilities and that a private enterprise was needed as a core element in the business so the three partners invested in UNEC (Spices and Condiments Business Unit), embedded in the AGROCENTRAL structure, but independently managed by very skilful personnel. Salaries and operational expenses were covered by the initiative. This was criticized by the development community in Bolivia, particularly the aid agencies which thought that "MAPA and SOCODEVI are substituting smallholders' responsibilities by assuming a paternalistic attitude... This will surely lead to poor local capability development... They are also engaging in private business activities that do not comply with the true nature of development initiatives... instead they should be helping smallholders develop their own enterprise, with their own resources" (Anon.).

Regardless of criticism, they continued, and some unorthodox measures were taken. As the oregano variety was not suited for international markets, they bought an entire year's production of the former variety and promoted its substitution with a new one that complied with international standards. However, this variety needed more care and, most importantly, fertile irrigated soils. The SFs, far from rejecting the option of varietal substitution, actually

planted the new variety in part of their irrigated plots. This was undertaken with assistance from MAPA and with pre-defined prices for future oregano production. Naturally, this also generated a high level of criticism among development practitioners in Bolivia: “They are substituting market dynamics... There is no way that these initiatives will be sustainable once the project is over!” (Anon.).

The SFs quickly found that it was a fairly beneficial activity compared with other traditional ones, but only with pre-defined prices and together with their main business, potato growing. They also changed their behaviour dramatically and started taking exceptionally good care of their oregano plots. On the other hand, UNEC, with its strictly business orientation, went from a processing-marketing-logistics focus to become involved in backward vertical integration (e.g. transportation, production and input supply) and started to collect fresh oregano, invested in modern drying facilities and started a side business of essential oil production with the low-quality oregano. Thus the SFs stayed on the basic agricultural production side, while UNEC took care of the processing and marketing activities. They also provided backward vertical integration services, mounting greenhouse facilities, producing and selling oregano seed-plants to satisfy the growing demand of new SFs interested in joining the initiative.

Today in the central valleys of Chuquisaca, you can see a complete cluster of oregano production. From about 10 ha of oregano grown by 40 SFs in 2000, there are now more than 300 ha grown by almost 1200 SFs. In 2005 UNEC started to report considerable net profits from their operation; but the information is confidential. Today UNEC is a very profitable corporation. Its governance structure includes the MAPA Project, SOCODEVI and AGROCENTRAL, each holding 33 percent of the chairs on the Board of Investors. The AGROCENTRAL chairman represents the interests of all SFs involved in the initiative. Profits are being used to cover technical assistance costs partially and to build up a risk fund in order to cover eventual price falls in international markets.

#### **4.1 Oregano: a high-value product**

Oregano derives its value on one hand, from the fast-growing global spice market. Spice consumers are asking for exceptionally high-quality products; strong and homogeneous flavour and aroma, essential oil concentration and freshness. Some segments are also demanding organically grown produce, good packing and labelling. All these characteristics are met by Bolivian oregano, which is now a competitive product in highly demanding markets such as Brazil, Argentina and Uruguay. Oregano essential oil is also highly demanded in the spice market. UNEC has started trial export operations in order to discern market requirements for this new product.

On the other hand, the value of Bolivian oregano comes from location-related assets such as proximity to three major spice markets and relatively good roads that connect production and processing areas with an airport. These assets make good synergy with relatively available irrigated land and availability of family labour. Together, these groups of assets resulted in relatively low production, processing and transportation costs, which gave the business a net advantage in the market.

Oregano performs well in the Chuquisaca central valleys because it fits well into local restrictions and quality is reached without difficulty (i.e. with minor increases in financial and other inputs). Although the profit for SFs was not comparable to the returns they were receiving on potato production, SFs were more interested in the financial liquidity of their systems so overall outcomes for SFs were enough to drive change.

#### **4.2 The SF's sound economic logic**

The SFs in the Chuquisaca central valleys have diversified livelihoods based on irrigated potato production and other rainfed crops such as wheat. The domestic market for potatoes has seen an enormous increase in price volatility over the past years. Thus traditional livelihoods in the region have repeatedly suffered great stress; only once every three years have earnings from potato harvesting been reported. Migration has increased as an emergency strategy in 'bad' years.

As mentioned previously, the SFs responded quickly to the market opportunity made available by the initiative. They supplanted a small portion of their potato fields for oregano fields. Interestingly, they were not too concerned about trying to get better prices for their produce (e.g., by bargaining price increases with UNEC), nor were they willing to replace their potato fields totally. Rather, they were much more interested in price stability during the year. When asked about why they didn't grow oregano in the entire irrigated plots, they answered, "Potatoes are still our main business. With spices we get cash but when a good year for potatoes comes, we make money." They were using an HVP to give their system liquidity.

Given that oregano was integrated into the Chuquisaca SF systems, it did not compete with their core business, but complemented it. Hence financial liquidity derived from the oregano production served to buy seed potatoes and other agricultural inputs. The economic reasoning of SFs changed due to the fact that the initiative absorbed change process costs by providing a stable price year-round, together with sound technical assistance. Although specific benefits from oregano production were relatively low, most of the business value was captured by the processing and marketing stages. Part of these benefits returned to SFs in the form of very low-cost technical assistance, quality seed provision and, eventually, profit sharing; hence they are actually partners of UNEC.

#### **4.3 The enterprise**

UNEC has been successful because it was born as a true enterprise, with a sound business philosophy and an expert businessman in charge of the operations. UNEC provided the missing organizational and institutional conditions needed to boost SF engagement in the business. Some key business issues that UNEC and the MAPA project resolved successfully were market intelligence, indirect financial services, marketing services and management of distribution channels. Another key action taken by the MAPA project was to understand the dimension of the initiative in terms of financial and technical resources and time before it was actually launched. Although Bolivian national agricultural policy did not favour this kind of venture, UNEC and the MAPA project managed to minimize negative effects of ill-designed agricultural policy.

## 5. Research context in the Andean region

If policy-makers as well as development practitioners and researchers intend to use HVPs for diminishing poverty in the Andes, good intentions, knowledge and resources will not be enough; there has to be a hospitable institutional context within which these initiatives can develop. So, what does the research context in the Andean region look like?

Worldwide agricultural research has seen an increased institutionalization process in the past 20 years (Engel, 1997). The influence of past green revolution successes defined the focus of these organizations and institutions: increase food supply through cost-reducing technological changes that lead to lower food prices. Thus the research effort focused on increasing yields of important food staples, which overall have shown a steady decline in prices. Although this strategy was very successful, it was not sufficient to eliminate rural poverty, even in countries that now have national food surpluses (Hazell and Haddad, 2001).

The Andes region was no exception. Supra-national research organizations aimed at boosting agricultural productivity emerged and have been successful. In recent times, however, there is certain uneasiness within the Andean research community. As a result, research organizations began developing initiatives that renewed objectives regarding poverty alleviation.

The CGIAR-IARCs such as the International Potato Centre (CIP) were also questioned about the actual results of research outcomes *vis-à-vis* their effectiveness in diminishing rural poverty. The centres undertook internal strategic reflection processes. There was also increased pressure from donors to show objective, positive impacts on rural poverty (A. Devaux, personal communication, 2005). They are currently engaging in research activities to (i) develop technological innovations and methodologies that are particularly fitted for rural poor contexts; (ii) understand how SFs can be linked to competitive markets; and (iii) develop policy recommendations for national research systems (Bentley and Paz, 2003). Some outstanding examples are (i) the Rural Innovation Institute at CIAT, which has developed pro-poor innovations in cassava, maize and other crops, as well as agrichain approaches to link poor SFs to the market; and (ii) CIP's Andean Potato Project, which has actively promoted the use of native potatoes to improve SF livelihoods.

National agricultural research systems (NARS) have also been questioned and have developed new imaginative projects and initiatives that are oriented towards (i) achieving food security for the poor, (ii) expanding agricultural exports by linking SFs to agrichains; (iii) finding alternatives for substituting coca production; (iv) promoting sustainable agriculture; and (v) promoting private, market-based research and extension services. Good examples of the last initiative include the INCAGRO (Innovation and Competitiveness for Peruvian Agriculture) project in Peru; the former PROMSA (Project for Modernization of the Agricultural and Livestock Sector) project, funded by the World Bank in Ecuador; SIBTA (Bolivian System of Agricultural and Livestock Technology), recently created as part of the national agricultural research system in Bolivia; the PBA Corporation, a private foundation of participatory and sustainable development for SFs in Colombia; and the PROINPA Foundation in Bolivia.

Finally, at the grassroots level there are also some very interesting organizations, mainly NGOs, that are launching very innovative initiatives oriented towards (i) providing technical and commercial services to SFs; (ii) improving empowerment among SFs; and (iii) developing gender-based initiatives. These organizations also carry out research activities. Examples include CIPCA (Centre for Research and Promotion of Smallholders) in Bolivia and Swiss Aid, an NGO in Ecuador.

### **5.1 Issues regarding research organizations in the Andean region**

Although every organization has unique objectives, interests and strategies about how to approach poverty reduction, some common issues can be highlighted. Bentley and Paz (2003) identified such issues for the Andean Region.

**5.1.1 Chains, markets and private technical assistance and research.** This focus, which is now widespread in Bolivia, Ecuador and Peru, aims to alleviate poverty by developing SF's capacity to generate and capture economic benefits. SIBTA in Bolivia, PROMSA in Ecuador and INCAGRO in Peru are the institutions that promote this focus. These institutions share a vision of the farm-food chain, where the market is what defines the crops that are important for the country and the priority research topics. Farmers' research and extension demands are considered when prioritizing projects. They are required to make monetary counterpart contributions, which increase as new projects are financed. IICA and other cooperation and donor agencies (World Bank, UNDP, IFAD, DANIDA...) are actively promoting this focus.

SIBTA's focus in Bolivia is similar; but it is implemented somewhat differently because it aims to be a permanent institution while PROMSA and INCAGRO are projects. SIBTA has taken three years to get organized and is now starting to work; while PROMSA got started rapidly and financed many activities during the same time. INCAGRO has planned two more phases in total and plans to operate for 8 to 10 years. There are different opinions about the results of these projects; some say that the private research and technical assistance services will not be sustainable when the projects end; that the farmers cannot and will not pay for these services. Nevertheless there is anecdotal evidence of potential impacts: PROMSA has trained 500 technical people, some at the MSc level; and it currently has 128 research projects. SIBTA has involved more than 26 000 SFs in its 80 projects, while INCAGRO has 68 projects running.

**5.1.2 Platforms, clusters and networks** have been formed in Bolivia, Ecuador and Peru, bringing together a series of organizations. Examples include the INNOVA Rural Innovation Project, the Unitas Network and AIPE (Association of Institutions for Promotion and Education) in Bolivia; CEA (Ecuadorian Coordinator of Agro-ecology) and the Cántaro Network in Ecuador. Sometimes these platforms are explicit and are proactively created (Unitas Network, AIPE, CEA...); at other times they are informal and link institutions around themes or common donors (e.g., the Cántaro network of SDC projects). Some platforms are "networks of networks," which function as groups for discussing national themes and helping with national and international coordination. There are local networks and institutions that promote synergistic actions and share knowledge of methods, technologies and focuses. There are also networks that act like management agencies,

**Comment:** Am not familiar with this term. Second-order?

financing projects or providing services to their members. Lastly there is a solid chain of information networks in the Andes (e.g. INFOANDINA, an information network of CONDESAN, the Consortium for the Sustainable Development of the Andes, sponsored by SDC) and even a network of information networks called REDISAL (Information Networks for Sustainable Development in Latin America).

**5.1.3 Research and extension structure.** The general opinion in all three countries is that there are no linkages among scientific researchers, extension agents, SFs and the market. Technology supply and demand do not flow from researchers and extension agents to SFs and the market and back again. The scientists do not know what the market and SFs think of their technologies so they cannot improve them. The institutions, even when using participatory methods, have problems communicating as equals with SFs and of knowing what they want. Some think that the SFs have “limited” demands and that they are not aware of market opportunities. Furthermore, these countries have dismantled their national extension systems, which complicates the relationship between researchers and SFs even further. The million-dollar question is: How do you take knowledge generated in research institutes out to the field and back again?

**5.1.4 Biodiversity, plant breeding and poverty alleviation.** Many institutions in Bolivia, Ecuador and Peru study and promote actions to conserve and use biodiversity; but they clash with plant breeding and the fight against poverty. Plant breeding with native species can improve food security and farmers’ living standards, but will biodiversity decrease? The use of transgenic crops also needs to be addressed. In Ecuador and Peru, many organizations are fighting to impose a moratorium on the research and use of GMOs.

**5.1.5 Pro-poor research and extension with resource-dependent technologies.** In the Andes the emphasis is on having a pro-poor focus (i.e. helping the poorest of the poor first), but this is being done with technologies that require resources (money, good land, water, organization, a 15 percent counterpart fund, nearby roads). These technologies are accessible for the poor who have such resources. The poorest of the poor are actually excluded from the pro-poor focus.

Research and extension in the Andes have focused on resource-dependent technologies (e.g. land, water, money). However, the agro-ecology movement is also strong, perhaps more so in Ecuador than in Peru and Bolivia. These movements seek kinds of production based on the SFs’ own resources to achieve self-sustainability. The concept of integrated farms — which use few external inputs, produce most of their own inputs and produce many crops on a small scale for home use — is common among development organizations in Ecuador, but apparently not in Bolivia or Peru. Agro-ecology, linked with concepts of the integrated farm, is an alternative to resource-dependent technologies and can be a good option for SFs who seek to obtain high-quality, competitive products. Institutions that promote these focuses in Ecuador are also trying to link these farms to the market.

**5.1.6 Smallholder-indigenous groups doing R&D.** In Ecuador there are several indigenous-SF groups involved in R&D activities; e.g. TUCAYTA (Quechua acronym meaning “United for all Cañar Communities”) and the AAIC (Association of Indigenous Agronomists from Cañar). These groups have consolidated organizations, some of which

can show a clear impact of their activities. Nevertheless, they need help with participatory extension methods and knowledge of markets. In Bolivia we do not know of any such groups although there are the OECs (smallholders' economic organizations), which do not do R&D but are responsible for the joint marketing of products.

**5.1.7 Small farmers' business corporations and cooperatives.** There are some interesting experiences of SFs doing business with entrepreneurs: (i) in Bolivia there are Irupana, a mixed firm/cooperative that exports high-quality coffee and works with poor SFs; and (ii) ASOFRUT (Fruit Growers Association), an incorporated firm that processes and sells tomato products (mainly tomato paste) on the Argentine market, buys the produce from SFs, hires technical assistance from a specialized NGO, and has made the NGO's employees and SFs partners of the firm. In Ecuador there is the firm Agrofrío SA-IQF, a consortium of entrepreneurs and SFs, promoted by IICA, which produces, processes and exports high-quality frozen broccoli. In Peru asparagus growers have organized to export their products, using similar mechanisms: market-entrepreneur-SF relationships. This can be a good way to create sustainable links between the market and SFs. It also seems that these types of relationships can sustain the cost of technical assistance and even some of the research.

## 5.2 Research priorities related to HVPs in the Andean region

As pointed out previously, SFs in the Andean region have to overcome limitations and manage constraints in order to benefit from HVP opportunities, taking into account several issues in order to make HVPs true opportunities for SFs. Among the many research needs in the region, some of the most important are:

- *Basic research on biochemical and physical properties* and potential new uses of biodiversity-based products, which have the potential to become HVPs if consumer demands are met. This requires a thorough knowledge about product attributes, especially those that have potential nutritional or pharmaceutical appeal because these markets require full disclosure of the product's components. Research needs include:
  - ⇒ identification of active principles for Andean roots and tubers used by ancient cultures to treat diseases such as diarrhoea and other stomach diseases;
  - ⇒ identification of the molecular structure of starch and sugar from rainforest roots as alternative sweeteners for diabetics;
  - ⇒ ultraviolet stability determinants of organic tropical tinctures of *achiote* (*Bixa orellana*), also known as annatto or lipstick tree.
- *Genetic improvement* is needed for both introduced and traditional varieties such as research on tomatoes and asparagus, which is conducted globally. Are they really a priority? Pro-poor crops? There are also genetic improvement opportunities for endogenous, semidomesticated crops. Research initiatives of this kind must use hi-end technology such as gene characterization techniques and in vitro vegetative propagation. Some issues for future research are:
  - ⇒ vegetative material production of *sauco* (*Sambucus peruviana* – type of elder), a shrub grown in the Peruvian central highlands that produces a berry often used for making marmalade; but highly variable in taste, juiciness and yield;
  - ⇒ gene fingerprint characterization of black amaranth in the Chimborazo valley in order to develop a territorial-identity product;
  - ⇒ Seed production of exotic fruits from south-western Mexico and Guatemala.

- *Sustainable farming systems* need to be developed for SFs that live in asset-restricted contexts. Emphasis should be placed on developing agricultural input production such as biofertilizers and biological pest controllers that can be produced locally with the support of national or supranational biotech research facilities. Sustainable farming techniques have to be in line with the availability of local labour. Some research issues are:
  - ⇒ biofertilizer pelletization and stabilization of active components;
  - ⇒ identification of insect pheromones and production of insect attractants.
- *Post-harvest and conservation systems* appropriate for SF agriculture, particularly innovative systems that can cope with plot dispersion and variable harvesting periods.
  - ⇒ development of mobile or semimobile pre-freezing and packing facilities for horticultural produce;
  - ⇒ small-scale, efficient drying facilities that use renewable, environmentally safe fuel sources.
- *Market development for exotic produce* that may have a strong market potential. This should be done bearing in mind that public initiatives have limited resources and that traditional market-development techniques are almost always resource demanding.
  - ⇒ how to market biodiversity-based products in new markets;
  - ⇒ markets for Andean roots and tubers;
  - ⇒ markets for gourmet coffee;
  - ⇒ markets for amaranth and quinoa.
- *Strategies for developing products with cultural and territorial identity* could have an enormous impact on products based on such assets. The question is how to assure the appropriation of outcomes by SFs; and if that can be done, how to share the benefits effectively. Examples include:
  - ⇒ Peruvian *pisco*, a native brandy;
  - ⇒ Bolivian gourmet coffee;
  - ⇒ Mexican pitahayas.
- *National agricultural R&D policies* need to be crafted so they can deal with HVP initiatives that often require flexible policies. Important R&D issues are:
  - ⇒ allocation of public resources to private development operators who will produce public and private goods;
  - ⇒ long-term public financing arrangements to support process-oriented initiatives rather than product-oriented projects;
  - ⇒ improvement of financial mechanisms such as competitive funding in order to make them more sensitive to innovative, unorthodox proposals;
  - ⇒ design of strategies for developing local service markets such as technical assistance and marketing services and initiatives to enhance connections to existing financial services.
- *Creation and conservation of enabling business environments in rural areas* that favour the emergence of private SF ventures. For the latter to occur, there is an urgent need to shift from the traditional view of development — where neoclassical maximization axioms define the purpose of organizations/institutions — to a more systemic view where transactional and institutional principles are used.
  - ⇒ understand the SFs' "economic logic" of submaximization of benefits in asset-restricted environments;

- ⇒ develop recommendations for promoting business alliances between SFs and private corporations;
- ⇒ design novel local and national public incentives for developing new ventures.

## 6. Conclusions

There are important issues that need to be taken into account in order to promote HVP integration effectively into SFs' economic systems. Specific attention should be devoted to developing a sound, but simple framework to define what is understood by an HVP. Some principles for crafting this framework were proposed as guidelines for this purpose.

It is also important to acknowledge particular characteristics of Andean SFs in order to help them grasp opportunities related to HVP. Particularly important is the fact that the adoption of HVPs by SFs is complex; elements such as asset restrictions, behaviour and context conditions have to be studied thoroughly in order to design successful initiatives. The SFs are not as homogeneous as we researchers and practitioners of the R&D community would like. They have considerable asset restrictions that limit their possibilities of generating economies of scale, which would enhance returns to their assets; thus a clear differentiation is needed in order to plan effective initiatives. We also have to bear in mind that although SFs can benefit from introducing HVPs into their economic systems, (i) not all HVPs are real opportunities for SFs; (ii) the integration of HVPs into SFs' economic systems in the Andean region is not a straightforward process; substantial changes have to be made in the basic characteristics of the farm system; and (iii) HVPs usually need specific local, national or even regional institutional and organizational conditions that are not readily available in the Andean region.

After a period of strategic reflection, research centres at the supranational, national and local levels have developed innovative responses for assessing rural poverty issues that are

spearheads in the process of developing a common understanding how poverty can be defeated using innovative approaches such as HVPs.

There are many needs for research regarding HVPs for SFs: basic research on biochemical properties, genetic improvement, sustainable agriculture, post-harvest technologies, market development, cultural and territorial products, national research policies and enabling environments for SF business development. These themes, far from being exhaustive, are just examples of research priorities in the region.

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