

CHAPTER 2

PERUVIAN EXPORT AGRIBUSINESS SECTOR: Lessons from asparagus exports

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INTRODUCTION

The purpose of this article is to analyze how important non-traditional agricultural exports are to Peru. The development of the asparagus export activity is explained under this context in order to identify the successful factors that enabled the development of this in a relatively adverse macroeconomic context as well as the risks of its future development.

This study is relevant because, on the one hand, it shows Peruvian opportunities to develop competitive advantages given the new consumption patterns used by developed countries' consumers who prefer fresh, natural and nutritive products as well as the natural advantage of Peru in producing different kinds of food at any time of the year. On the other hand, this study emphasises the importance of coordination mechanisms among enterprises to reduce transaction costs and to show the need of strategic alliances to consolidate a market competitive position. The asparagus case is an example of the success and crisis of an export activity that was considered consolidated. It is interesting to analyze the components behind such a crisis as well as the reaction of the business sector, a consideration that could be useful to develop other agricultural and industrial export activities.

In order to achieve the proposed objectives, the article has been organized in four sections. First, is a brief presentation of the new food consumption pattern, highlighting the most important characteristics of consumers. Section two shows the relative importance of the Peruvian export agricultural industry and its composition in order to reveal the existing diversification level. The third section summarizes the main concepts underlying the enterprises' growing process, emphasising the strategies of vertical coordination and integration as an alternative to facing competition and decreasing transaction costs. Finally, in the fourth section an explanation is given about the expansion and crisis of asparagus export activity, showing its economical importance, main markets, strengths and weaknesses of the sector, lessons learnt and perspectives. To develop this fourth section, the main asparagus exporters provided a valuable collaboration.

A. The new paradigm in food markets

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I would like to thank Alcira Bojorquez for her valuable collaboration.

Peruvian food products for export take part in increasingly competitive and demanding markets. Furthermore, the international trade is developed within a framework of liberalizing markets, reduction of obstacles to trade and consideration of the environmental dimension.

The international trade in food cannot be unaware of the trade system's basic principles: trade without discrimination, freer trade gradually and through negotiations, prevision by means of commitments, consolidation, promotion of fair competition, development and economical reform. Particularly for agriculture, the development of more fair markets for farmers is promoted, based on the improvement of methods aimed at removing distortions in agricultural products trade and promoting access to markets¹⁵.

On the other hand, several studies show that consumers are more concerned about the kind of products they purchase. Now, they demand more information about their origin and production methods. Albert Hijn, in Status Report 2000¹⁶ indicates the most important aspects required by consumers.

- Quality: this depends on the standards established by each destination market. The most demanding countries are: United Kingdom, The Netherlands and Germany.
- Consistency in physical characteristics of the product: shape, size, color, texture and steadiness.
- International certification that guarantees proper agricultural practices: proper use of chemical fertilizers and pesticides. This means the limited use of these only for strictly needed cases. Organic solutions are promoted.
- International certification that guarantees proper labor practices: well-treated employees, fair salaries, staff efficiency, proper training, among others.
- International certification guaranteeing that the producing company complies with quality processes, which implies that the elaboration of the products at the plant takes into account sanitation and environmental care.
- Ecological certification, that guarantees the ecological and organic nature of the product. This requirement is proposed by an increasing group of consumers.

These requirements are explained in a context where the demand for food has been modified as a result of demographic changes and lifestyles changes of the population from the most important destination markets. The main factors contributing to such modification are the following:

- *Increase of the high-income group in developed countries*, that has increased the demand of quality products. For instance, in U.S.A., in 1970, 23% population was considered in the high-income group and in 1990 this share increased to 31%.

¹⁵ OMC. El Comercio hacia el Futuro. (Trade towards the future) 1999. pp. 7 and 17.

¹⁶ www.ahold.com

- *Increase of per capita income in developed countries*, United States, The Netherlands, United Kingdom have registered annual average growth rates of 4%. Meanwhile the per capita income in Spain increased by 5% during the 1990-1998 period.
- *More concern about nutritional and health aspects*, which has changed demand towards fresh and natural products. Per capita consumption of fresh fruits and vegetables has increased. For instance, in USA, between 1970 and 1992, per capita consumption of fruit increased to an annual average rate of 7.2%. In England, consumption of fresh and processed fruit increased by 109% in 1994-1999. It should be noticed that while the consumption of citric fruits (i.e. oranges) decreased by 20%, consumption of grapes and bananas doubled. Canada also reported growth rates higher than 10% in 1999 in fruits and vegetables per capita consumption with respect to the previous year, for fruits such as cherries, strawberries, raspberries (40%) and melons, etc. Regarding vegetables, it should be noticed a 19% increase in asparagus per capita consumption¹⁷. In the North American market, 80% of the per capita consumption of fresh fruit is noncitric, such as: bilberries (22%), apricot (20%), avocado (14%) and mango (4%). Fruits with a positive growth during the nineties are: mango, papaya, sour cherries and melons which per capita consumption in 1999 increased by 4%, 24%, 19% and 5%, respectively, with respect to the previous year¹⁸.
- *Family unit size tends to decrease* which favors the access to quality products properly offered. For instance in USA, in 1970 the family unit was composed of 3.1 persons while in 1989 changed to 2.6.
- *Women increasing participation in the labor market* increases the demand for products of consistent quality and with proper presentation (variety of sizes, products ready to be used). For instance, in USA between 1985 and 1989, the number of employed women increased by 12%. Furthermore, their participation increased from 42% in 1980 to 45% in 1990. The female economic activity rate has increased in developed countries¹⁹. For instance, in the United Kingdom, it increased from 34.2% in 1993 to 52.4% in 1998.

The most important fear of fresh products consumers is the health risk related to the use of pesticides and their chemical residuals that are one of the main causes of cancer. This concern corresponds both to American and European consumers as well as Asians (i.e. Taiwan). Experts have identified the consumers' willingness to pay for a decrease in health risks as an indicator of food security. Additionally, they confirm that there is a direct relationship between the willingness to pay and the level of concern about the

¹⁷ Ministry of Agricultural, Food and Rural Affairs. Canada-Ontario.

¹⁸ USDA-Economic Research Service. Statistics Bulletin No 965.

¹⁹ Annex 1 shows the Female Economical Activity Rate for some developed countries.

health risks. This means the greater concern about this issue, the greater willingness to pay for a decreased likelihood of getting cancer. Socio-economical variables to determine the willingness to pay to reduce the risks are the following: health conditions of the agents and the concern about the cost and quality of vegetables²⁰.

Distribution companies of fresh products as a response to consumer's preferences are increasingly caring more about food quality and security. For instance, Royal Ahold²¹, a leading transnational company in fresh products trading in Europe with subsidiaries and partners around the world, established the "Farm to Fork" strategy and in 1999 created the Global Food Safety Committee. Royal Ahold also owns Santa Isabel Supermarkets in Lima, Peru. This company created a set of requirements in terms of products food security and quality and based on these, they establish alliances with their suppliers in order to improve environmental care in fields, during crop production and in animals' welfare.

Giant-Carlisle²² (Royal Ahold partner) prefers to purchase organic products as a differentiation strategy with respect to their competitors. They sell 1,200 natural and organic products. 150 of these are organic products. Albert Heijn, a leader supermarket of organic products in The Netherlands introduced the first brand of organic products in 1998. Two years later, there were more than 210 organic products, in 15 categories and it is still growing.

Thus, there is a consumer whose food consumption preferences incorporate the health care issue and therefore his concern is to minimize the risk of consuming food with chemical residuals. Therefore, food companies as a response to these demands are incorporating in their quality standards the food security and environment care issue.

Finally, in some markets such as Japan's, some food is used as gifts due to cultural reasons. Fruits are among these. Fruits that are popular gifts are tangerines, apples, oranges, grapefruits, etc. while cantaloupes are considered a luxury fruit gift²³.

B. Export of agricultural products from Peru

Importance and composition of Agricultural Export

In 2000, agricultural exports represented 9% of Peru's total exports value. This showed a decrease with respect to the previous years. In 1997, it represented 11.6%. Agricultural exports are between the third and fourth position in generation of foreign currency (Graph 1). The value of agricultural exports increased at an average annual rate of 8% between

²⁰ Fu, Tsu-Tan, et.al. "Consumer Willingness to pay for low pesticide fresh produce in Taiwan". In: *Journal of Agricultural Economics*. Vol 50, No 2. May 1999. pp 220-233.

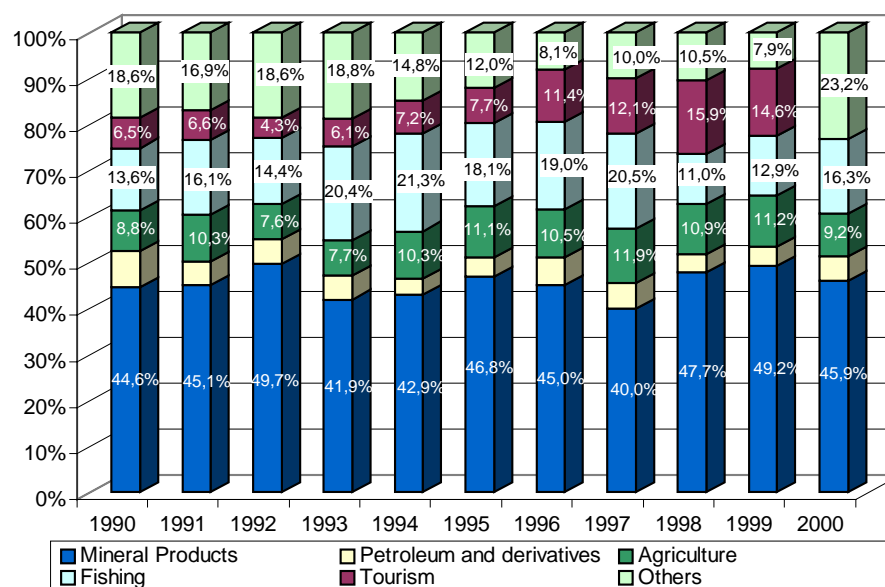
²¹ Annex 2 shows the Royal Ahold main stores in the world.

²² Royal Ahold. <http://www.ahold.nl/aholdstartpage.nfs/mainuk>. Giant Carlisle is the leader of food supermarkets in the American Market.

²³ Gehrt, Kenneth and Soyeon Shim. "The Role of Fruit in the Japanese Gift Market: situational defined markets". *Agribusiness*. Vol.14, No 5, 1998. pp. 338-339.

1990 and 2000. However, there is a big contrast in the average annual rate of growth between 1990-1994 and 1995-1999, in the first period it was 12.6% and in the second one it fell to 2.6%. The latter period was affected by El Niño (ENSO)²⁴ effects in 1997-1998 and in 1999 there was a lack of financial resources for production.

Graph 1
Main Export Activities Share



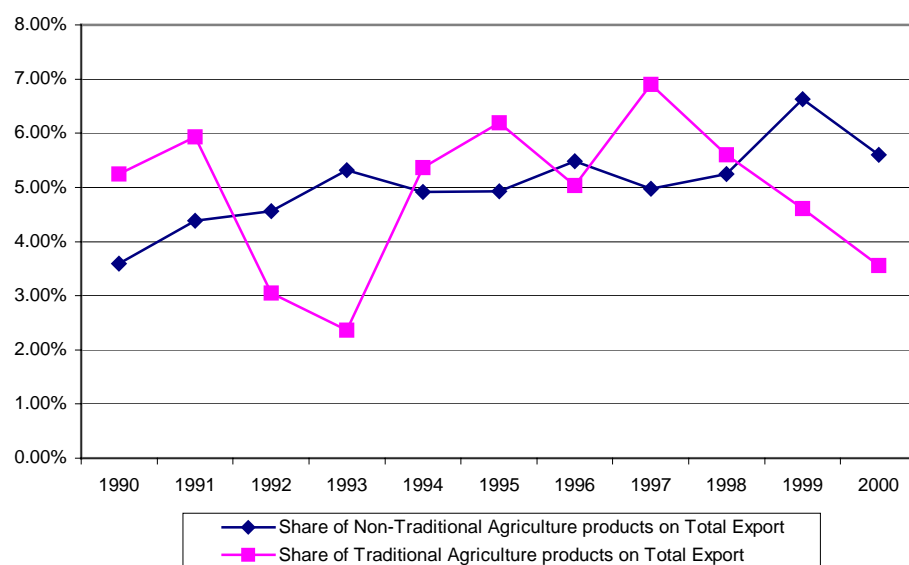
Source: Central Reserve Bank of Peru

The Peruvian agricultural export industry is composed of two groups of products. The first group is composed of commodities (i.e. coffee, sugar, cotton) and it is named the traditional agricultural export group. The second group is composed of a variety of products, many of these have a value added (i.e. canned and fresh asparagus, marigold flour, mangoes, cocoa butter, etc.) and it is named the non-traditional agricultural export group.

The first group shows a declining share in agricultural exports, decreasing from 64% in 1990 to 39% in 2000. On the other hand, non-traditional agricultural exports have increased their share from 36% in 1990 to 61% in 2000 (Graph 2).

²⁴ ENSO: El Niño Southern Oscillation

Graph 2
The Composition of Agricultural Exports



Source: Central Reserve Bank of Peru

Traditionally, agricultural exports are led by coffee, which, during 1998-2000 represented 90% of this group. Besides, coffee represented 35% of the total value of the agricultural exports in the year 2000 (US\$223 million dollars).

Other traditional export products are sugar and cotton, but are not significant. Sugar is scarcely exported, only to cover the sugar quota in the American market. Domestic sugar production is not enough to satisfy national demand. In the sugar industry the process of selling the sugar cooperatives to the private sector has yet to be completed. There is a national objective to become a leading sugar exporting country again in a competitive framework. For cotton, the national textile industry is the main purchaser of cotton fiber and cotton textiles are exported.

The declining share of traditional agricultural export is due to the steep reduction in the price of coffee during the nineties; between 1998-2000 this decreased at an annual average rate of 20%. Furthermore, given the drastic restrictions of the local financial sector, this production also decreased by 4% in 2000. The previous years, attempts were made to compensate this price reduction through increasing coffee export volumes.

The non traditional agricultural export group is composed of more than a dozen different products²⁵, which reduce the effects of price fluctuations of some of the products. However, asparagus exports (canned and fresh) represent 33% of the total value of non traditional agricultural exports. Asparagus exports were 134 million dollars in 2000, that represent almost half the value of coffee exports.

²⁵ Annex 2 presents the main Peruvian non traditional agriexports.

Diversification of non traditional agricultural exports involved different regions in the production process: coast, highlands and jungle (Table1). Besides, because of their nature, these are value added exports, they generate direct and indirect multiplier effects of production and employment in the local area of production. It is estimated by different studies that one field worker represents between two and three employees in other related activities.

Table 1
Non traditional export products by main producer area

Region	Products
Coast (0-500 m.a.s.l)	Asparagus, marigold flour, mangoes, dry beans,
Highlands (501-6,000 m.a.s.l.)	Yellow onions, cochineal, white corn, flowers
Jungle (2,000-80 m.a.s.l.)	Cocoa, palmitos,

m.a.s.l: meters above sea level.

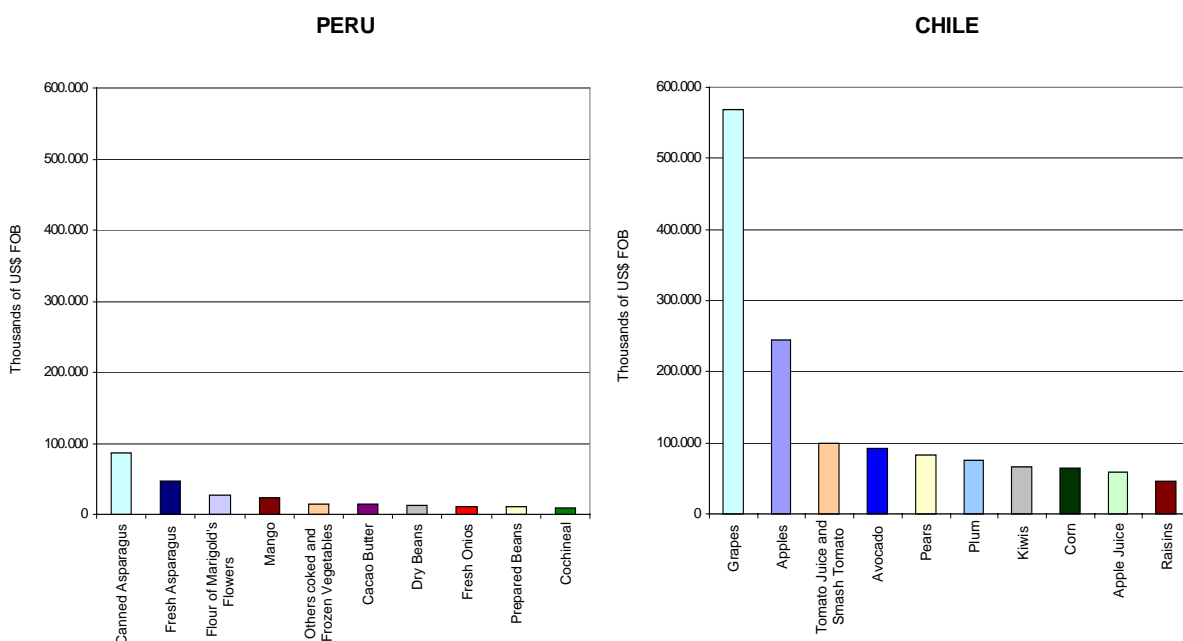
Because of Peru's natural conditions and the fact that it contains 80% of the total life zones in the world, it is possible to produce different products in different areas throughout the year. For instance, yellow onion can be grown in Nepeña valley-Ancash (144 m.a.s.l.) as well as in La Joya valley-Arequipa (1,200 m.a.s.l.).

The agribusiness sector is vulnerable to weather conditions because changes in temperature, humidity, solar radiation, and rainfall affect crop production by reducing yields, affecting blooming and/or flooding the fields. In Peru, El Niño drastically affects agricultural production, mainly in the coast area.

Access to technology in terms of seed adaptation and diffusion of irrigation techniques , allowed the development of new crop areas, especially for those products with market. For instance, when mango exports were initiated, the department of Piura was the only producer. Now, production has expanded towards the center coast (Casma – Ancash) given the growth of the main market – USA – and the favorable weather conditions.

However, Peruvian non traditional agricultural exports are still far from closer competitors such as Chile. For instance, the value of Chilean grapes and apple exports represents 18% more than the total value of the Peruvian agricultural exports. The value of Peru's main non traditional export products is very low compared to Chilean fruit exports (Graph 3).

Graph 3
High Added Value : Vegetables and fruits exports, 1999



Sources: Peru; Ministry of Agriculture. Office of Agrarian Information.
National Superintendence of Customs.
National Service of Customs of Chile. ODEPA.
Central Bank of Chile.

Non traditional agricultural exports can be divided in four groups: The first one stands for those products that are established in the international market (i.e. asparagus). These products were continuously in the top four positions of non traditional agricultural exports throughout the 1990s. The second group stands for those products that are very sensitive to market conditions and shows high positive rates of growth for some years and then its rate of growth became negative (i.e. cochineal, dry beans). The third group stands for products that have a relative low export amount, they have a highly fluctuating growth (i.e. yellow onions, olives, fresh garlic)²⁶.

Agricultural exports, diversification and competitive advantages

Monitor's²⁷ study clearly stated that Peru has a comparative advantage to satisfy the requirements of a consumer who is concerned about food security and nutritional aspects. However, the key issue is to convert those advantages into competitive advantages.

To have a general idea about the development of Peruvian agribusiness sector during the nineties, it is necessary to recall that during mid eighties the government promoted the

²⁶ See Annex 3.

²⁷ Monitor. *Construyendo las Ventajas Competitivas: los agronegocios (Building competitive advantages: agribusiness)*. PROMPERU, Lima, July 1995.

agribusiness export sector providing different kinds of incentives such as tax reimbursement (CERTEX), reduced interest rate for export loans (FENT), etc.²⁸. As a result many agribusiness firms entered the market. However, there was great volatility in firms continuity, for instance in the case of asparagus exports, between 1983 and 1992 there were 125 firms that exported at some point, but hardly 15 firms exported regularly along that span. In the early nineties, given the new macroeconomic conditions and structural reforms, many agribusiness firms that entered in the eighties went out of business and others entered in the market based on the new economic bases: markets liberalization, exchange rate policy based on market conditions, development of a land market, simplification of tax structure, etc.

Many entrepreneurs who entered in the exporter agribusiness sector, in the last decade, had a different attitude to develop their business. They were aware of the importance of investing in the fields for efficient agricultural production of raw material, of establishing incentives for an efficient vertical coordination and/or following a process of backward integration. The importance of having stable and credible contractual relationships based on agreements where the rights and obligations for each party are clearly stated as well the sanctions in case of non-compliance was realized. Nowadays, the concepts of efficiency and competitiveness are used not only at the production level but also the administrative stage. Entrepreneurs are more aware of concepts such as market preferences, social responsibility and environment conservation.

There is a set of issues to be solved before the different agribusiness opportunities in different parts of the country can be exploited. It is important to enhance and develop a systemic vision about agribusiness development. This means to include the dynamics of the agricultural sector and to solve its structural problems in order to promote a modern and efficient agricultural sector that can operate together with the agribusiness sector. Some of the critical issues are: lack of complete and consistent legislation to promote agricultural investment, to complete the property certificates process to guarantee land property rights, to finish protocols that show adequate sanitation conditions for those vegetables and fruits that have international market restrictions, and lack of agricultural services (i.e. technical assistance, credit, etc.).

On the other hand, the agribusiness sector needs to continue its maturity process in order to have a better understanding of the market requirements, sharing information, and making strategic alliances among firms to improve Peru's position in the final markets. Main restrictions faced by the export agribusiness sector are as follows: lack of coordination in organizing the final market supply and avoiding price reductions because of excess supply, change production aversion that leads to a production concentration in some products such as asparagus.

Besides, a necessary condition to develop non traditional agricultural exports is properly trained human resources that can manage and develop strategic planning for the

²⁸ The history of the agribusiness sector is very tied to agricultural development, where the land reform had an important impact, breaking an agribusiness management system. That analysis is beyond the scope of this paper.

development of new products and the introduction of them to new markets. Nowadays, it is not enough to know consumers characteristics, it is critical to develop an efficient method to meet their requirements.

C. Theory of the firm: transaction costs and vertical coordination

Competition and diversification

Markets and firms are interacting institutions, which are mutually necessary for their existence. Their duty is *resource allocation*. The way this duty is fulfilled and the pattern of resource allocation in space and time depends on the way market forces impact on the firm. The latter depends not only on the size of an individual firm's supply of (or demand for) a given product in relation to the total supply of (or demand for) that product in the market but also on the kind and amount of productive services which is already operating within the firm²⁹.

Competition favors diversification into new areas, it is a strategy to soften competition and favors the firm's growth. Although it may be profitable for a firm to continue investing and even to expand on its existing fields, it does not follow that it will be profitable for the firm to attempt any significant improvement on its position when the improvement entails a significant additional commitment of resources³⁰.

There is an important difference between growth and firm size. While growth is a process, size is a status. The firm size will be determined by the process of growth and the factors that affect it. Any change in circumstances that widens the productive opportunity of firms or increases their managerial capacity for growth, in relation to the growth of demand for their existing products, will tend to increase diversification³¹.

A specialized firm is highly vulnerable in an environment of changing technology and tastes, and can often make more profitable use of its resources over a period of time by spreading production over a variety of products. However, the changing nature of the production opportunity of the firm continually presents new investment opportunities. The firm could take advantage of those opportunities while at the same time maintaining and expanding those production lines to which it has extensively committed its resources.

In summary, new opportunities are related not only to changes in prices, tastes and other market conditions, but also to the special kind of productive services and knowledge developed by the firm³².

The expected actions of the competitors are part of the external environment of an individual firm, and the techniques adopted by the firm, to maintain its position in the

²⁹ Penrose, Edith. The Theory of the Growth of the Firm. Oxford University Press, 1995. p. 197.

³⁰ *Ibíd*, p. 136.

³¹ *Ibíd*, pp. 151-152.

³² *Ibíd*, pp. 105-106.

market, have a significant influence on the kind of new productive services that are created within the firm. The relationship between competition and the internal supply of productive services is of particular significance wherever the individual firm must keep abreast of new technical developments to compete successfully. The continued profitability of the firm is likely to be associated with the possibilities for innovation.

In a competitive and technologically progressive industry a firm specialized in given products can maintain its position with respect to those products only if it is able to develop sufficient expertise in technology and marketing to enable to keep up with and to participate in the introduction of innovations affecting its products³³.

The firm and transaction costs

The company is generally an institution that contracts production factors and organizes these to produce and sell products and services. To organize the production, the company establishes relationships with a large number of individuals and other companies.

An important aspect to be considered is the decrease of costs related to the organization and execution of transactions. A transaction takes place when a product or service is transferred from one activity to another to participate in another process. Transactions are mainly described based on three dimensions: (a) frequency at which transactions take place, (b) level and kind of uncertainty and (c) specificity of assets.

Transaction frequency refers to periodicity of purchase-sale operations. Uncertainty refers to the insecurity of demand and supply which makes companies develop coordination methods outside the market. When transactions take place under an uncertainty context, it is very expensive to point out in advance all the contingencies. Specificity of assets refers to the level under which an asset can be re-used in alternative uses and by different users, without sacrificing its productive value. It is related to the concept of sunk cost. The importance of assets specificity is evident in a context where contracts are not complete.

The concept of specificity is very important in long-term relationships that are related to specific costs or investments. Tirole states that when the parties contract, each one knows that as a result of such transaction, there will be benefits. In order to achieve such benefits ex post, there should be an optimum volume of product to compromise. Thus, benefits will imply an efficient quantity of specific investments ex ante.

Specificity of assets is one dimension to describe transactions and the issue least considered by previous industrial organization studies. The key aspect is not how large investments are but how specialized these are for a particular transaction. Products that are not specialized among the users have less risk, due to the fact that buyers can easily have other alternative supplying sources and suppliers can sell a product committed to one buyer to another buyer very easily.

³³ Ibid, p. 132.

The specificity of assets could originate from any of these three situations: a) specificity of place (location), in such a way that we could save in inventories and transportation costs; b) physical specificity of assets and c) specificity of human resources which originates from the fact the labor is specialized during the process of *learning by doing*. The reason why the specificity of assets is important, is due to the fact that once the investment is made, the buyer and the seller are establishing a bilateral exchange relationship during a considerable period of time³⁴.

On the other hand, the criteria of cost saving is critical to organizing commercial transactions. This concept has two parts: a) to save in expenses related to production and b) to save in transaction costs. In general terms, the problem of saving includes the election between a product and service for a specific purpose or for a general purpose. A multiple purpose product has the advantage of being acquired through the market but the design value might be sacrificed. In the case of a specific purpose product or service, differences are valued but its availability could be limited and affected by contingencies.

If transactions costs are depreciable, supply will be performed through buyers in the open market instead of contracting in advance³⁵. Thus, economy of transaction costs provides elements about the determining factors for vertical co-ordination.

Different authors³⁶ state that the agents involved on an agribusiness activity have incentives for developing vertical coordination mechanisms, when they process perishable products. Vertical coordination through agreements contributes to reduce transaction costs associated to transactions made on the spot market.

Vertical coordination and vertical integration

Vertical coordination is a complete concept that takes into account the process consisting of the different production and distribution functions vertically interdependent. Vertical coordination implies the organization of the direction and control of the different parts that belong to the productive and commercial system. Vertical coordination could happen through vertical integration or formal agreements between independent firms³⁷.

Shaffer states that vertical coordination is a special aspect of the contractual relations among agents. The main issue is the effectiveness of coordinating supply and demand decisions. This concept uses the price as a key variable to provide information and incentives and it also shows the behavior of the agents who have a strategic position³⁸.

³⁴ Williamson, Oliver. "The Economics of Organization: The Transaction Cost Approach". In: *American Journal of Sociology*. Vol. 87, No 3. November 1981. p. 555.

³⁵ Williamson, Oliver. "Transaction Cost Economic..." *Op. cit.* p. 245.

³⁶ Sporleder, Thomas. "Managerial Economics of Vertically Coordinated Agricultural Firms". In: *American Journal of Agricultural Economics*. Vol 74, No 5. December 1992. p. 1229.

³⁷ King, Robert. "Management and Financing of Vertical Coordination in Agriculture: an overview". In: *American Journal of Agricultural Economics*. Vol 74, no 5. December 1992. p. 1217.

³⁸ Shaffer, James. "Food System Organization and Performance: Toward a Conceptual Framework". In: *American Journal of Agricultural Economics*. May 1980. p. 137.

In the case of agribusiness, vertical coordination can be developed by formal contracts between the firm and independent producers. In the contracts the quantity and the price are established. Depending on the type of the final product and its final market, the producers can receive technical assistance and money paid in advance. These disbursements allow the producers to develop the different agricultural activities (i.e. to buy fertilizers, pay labor, pay services, etc.). Because of the direct relationship between the producer and the agribusiness firm, there are two important effects for producers: a) reduction of price and income fluctuations, b) some degree of certainty in the production stage that favors production and investment planning decisions. The latter is important for the introduction of new technology. For many agricultural producers, to belong to an agribusiness chain means a change from a traditional way of production to entrepreneurial management. This is one of the main benefits of the contracting relationship.

In the absence of vertical coordination, the producers will be exposed to low prices because of the production disorganization that could generate excess of supply of the raw material. A coordinated and stable relationship between the agents allows availability of raw material fulfilling the quality standards imposed by the final market. Quality and homogeneity in the raw material are key issues. Those characteristics cannot be fulfilled by occasional producers who use traditional techniques and ignore agribusiness requirements. This fact prevents transactions on the spot market³⁹.

Backward integration will take place only if it is expected to reduce costs. The decision to integrate backwards evaluates the alternatives of buying the materials (i.e. raw materials) or producing them. The profitability of backward integration is measured by its effect on the net revenue of the firm. Hence, the opportunity to increase profits by integrating backwards is to be treated in the same way as other productive opportunities of the firm – the additional profit expected must be compared with the expected profit from alternative uses of the resources required. The relevant savings in production that backward integration may bring can be divided into two categories: those related to the firm's efficiency, and those related to the price that must be paid for supplies. In the first category, all problems associated to provision of supplies are taken into account, with proper quality, amounts and on time⁴⁰.

Vertical integration is a method by which a firm attempts to maintain its competitive position and to improve the profitability of its existing products. Much integration is directly traceable to the technical efficiency of conducting a sequence of operations in close proximity to the maintenance of a smooth flow of supplies⁴¹.

Backward integration in agribusiness means that the firm assumes the organization and management of the different stages of the production process. So the agribusiness firm

³⁹ Gómez, Rosario. *Relaciones Contractuales en la Agroexportación: el caso del mango fresco* (Contractual Relationships in Agricultural exports: the case of fresh mangoes). CIUP, Lima, 1995. p.27.

⁴⁰ Ibid. pp. 146-147.

⁴¹ Ibid. p. 149.

has fields in production, to satisfy its raw material requirements (partially or totally). In this case, the impact of the agribusiness company over the producers is limited because the firm will have little contact with them. This strategy is usually used for crops that are intensive in financial capital and technology, factors that are restricted for a large number of producers.

Monitor's study of the Peruvian agribusiness sector states that competitive advantages are obtained based on the selection of products that can better meet the customers requirements and have more supply of it than the competitors. Market segmentation helps to understand customers' needs and preferences. Markets can be segmented according to different criteria such as: location, volume, services requirements, etc.⁴². It is very different to compete with a Peruvian brand in a traditional market for processed products than to participate in a market niche with an innovative product. While in some market segments a Peruvian brand could have international recognition, competition in traditional segments could mean competing with internationally well known large corporations and brands⁴³.

Monitor's study points out that Peru's export agribusiness sector demands that agricultural production units be competitive based on explicit strategies and information in order to develop sustainable advantages. In 1995, the study states that the sector needs to be in more contact with the final markets and have a better understanding of them. By the end of the nineties this fact has improved and some agribusiness export firms have developed strategies and alliances in order to meet market requirements and obtain a competitive position.

Internal and external alliances are a means of developing a competitive advantage. Backward coordination guarantees a stable supply with consistency in quality and volume. Forward coordination produces better information about market behavior in terms of prices, competition and customer preferences.

A firm has two ways to compete: by costs or by differentiation. To compete costs is possible mainly when the prices are favorable, and the firm has competitive advantages and enough volume to supply the market. Peru, has mainly possibilities to compete based on differentiation by products, services, etc. The key issue is to understand that the market continuously changes so it is important to be flexible and able to offer permanent improvements and new ways of differentiation.

D. THE ASPARRAGUS EXPORT CASE

⁴² Monitor Company. Construyendo las Ventajas Competitivas del Perú: Los Agronegocios. (Building Competitive Advantages of Peru: Agribusiness) Promperú, Lima, 1995. p. 17.

⁴³ Ibid.

History

Asparagus was introduced in Peru in the late fifties. Its production was concentrated in Chao and Viru valleys (La Libertad). Only one variety, “Mary Washington”, was brought. This seed was used for approximately 25 years. In the mid eighties adaptation and adoption of new varieties began.

The “Mary Washington” variety was used during 20 years mostly to produce canned asparagus. During the second half of 1980 the development of fresh and frozen asparagus was developed.

Economic importance

Exports

Asparagus exports had an increasing share in the total value of agricultural exports. This share has increased from 10% in 1990 to 21% in 1999. Asparagus is the second largest agricultural export product and it is exported in three forms: canned, fresh and frozen. It should be noted that fresh asparagus exports have increased considerably throughout this decade, at an annual average rate of 30%, while canned asparagus exports had an annual average rate of growth of 14% during the 1990-2000 period.

Decentralized production

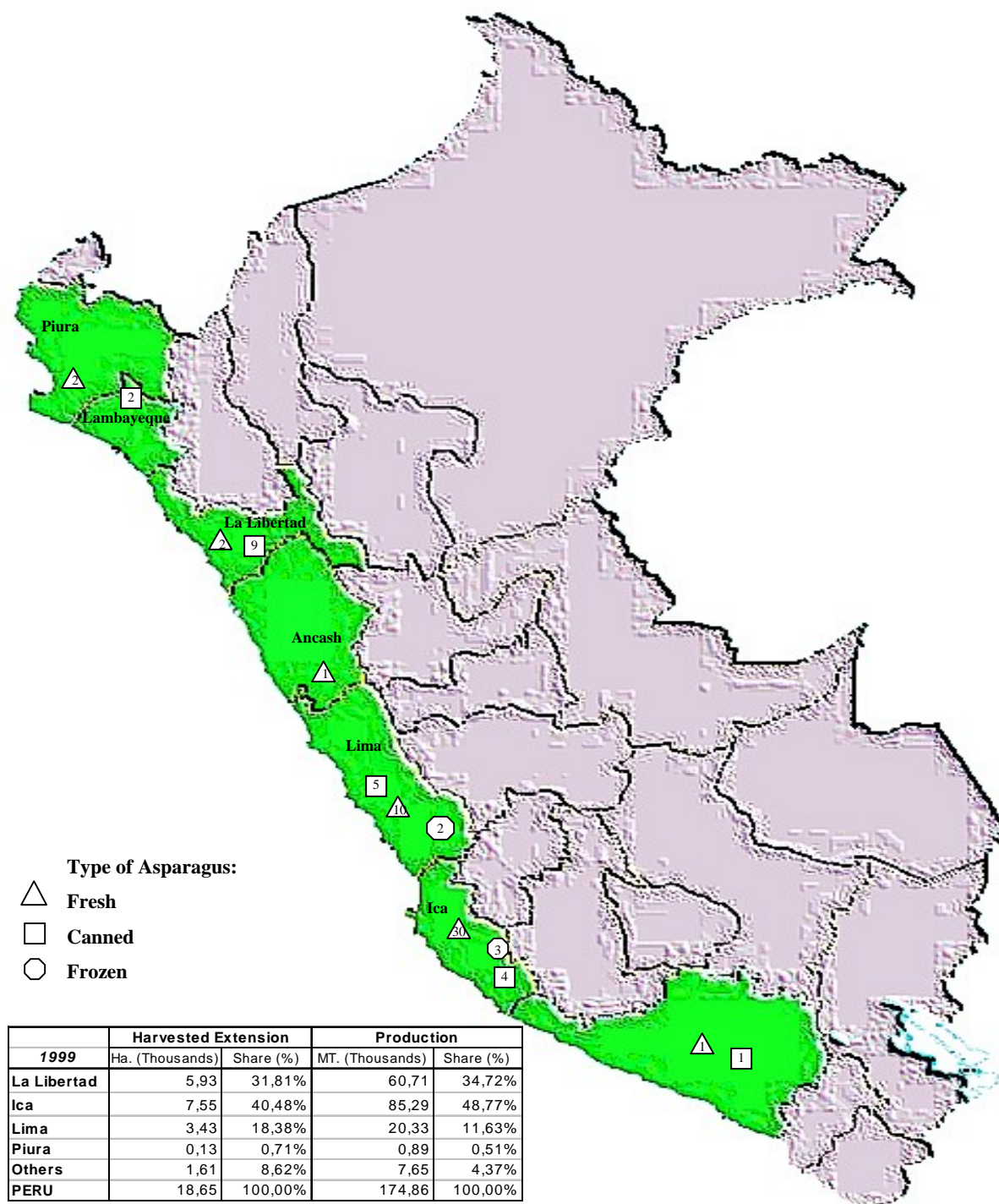
Asparagus production is distributed along the Peruvian coast. Although during the sixties, its production was concentrated in the Chao, Viru and Moche Valleys (La Libertad), since the mid eighties, asparagus production areas began to expand throughout the coast. To date it is produced on practically all the coast, from Piura to Arequipa (Map 1). Official information reports 18,600 hectares of harvested asparagus, representing 2% of the cropland in the Coast. The main producer departments are Ica and La Libertad concentrating 49% and 35% respectively of national asparagus production.

Employment

This expansion towards different zones has generated local production and employment multiplier effects. It should be noticed that agricultural production of asparagus is labor intensive, especially during harvest. Furthermore, to transport the asparagus from the field to the processing centers requires refrigerated transportation services. Additionally, there is an important chain with the glass industry for jar supply in the case of canned asparagus.

MAP 1

**Main Production Areas and Localization of Main Asparagus's Processing Companies,
according to type of Asparagus**



Source: Peru: Ministry of Agriculture. Office of Agrarian Information.
 Peru: Ministry of Agriculture. 1st National Census of Asparagus Producers and Processing Factories, 1998

Markets

Asparagus exports, in their different forms, show a reduced market diversification. The most important markets of Peruvian asparagus exports are Spain (66%) for canned asparagus, the United States (75%) for fresh asparagus and the United States (42%) and Spain for frozen asparagus.

In 2000, canned asparagus volumes increased by 16% at the main destination market, Spain, showing a decrease in comparison with the annual average rate of 1994-1998 of 43%. In other markets such as the Netherlands, Germany and Denmark, the annual rate of growth was negative during the decade (Table 2). This reflects the larger competition that Peru has to face, especially due to the presence of China that competes through costs, limiting Peru's opportunity for selling asparagus.

Table 2
Canned Asparagus: Volume export rate of growth by final market

Years	2000	1999	1998	Average 98/94
<i>Countries</i>				
Spain	16.1%	9.0%	-2.7%	54.7%
France	-15.2%	14.3%	-0.2%	9.6%
Netherlands	-9.7%	-14.7%	-58.2%	-30.4%
United States	282.1%	-22.8%	-16.7%	192.0%
Denmark	-48.2%	13.0%	-29.7%	-6.3%
Germany	-17.7%	19.8%	-62.6%	-18.9%
Belgium	98.6%	-39.3%	18.3%	33.3%
Italy	-48.5%	70.4%	-46.6%	-3.6%
<i>Others</i>	-20.8%	44.2%	18.5%	38.3%
World	1.9%	9.9%	-18.5%	-8.2%

Source: Peru: Ministry of Agriculture. Office of Agrarian Information.

Fresh asparagus volumes showed positive annual growth rates at almost all destination markets except Italy and France. Fresh asparagus volume for the United States, the most important market, increased 37% with respect to the previous year, being higher than the annual average growth rate of 1994-1998 period (29%) (Table 3).

Table 3
Fresh Asparagus: Volume export rate of growth by final market

Years	2000	1999	1998	Average 98/94
<i>Countries</i>				
United States	37.3%	60.6%	9.7%	20.8%
Netherlands	30.9%	33.6%	8.0%	10.0%
Spain	24.0%	42.0%	38.7%	99.1%
United Kingdom	34.9%	34.9%	15.7%	15.2%
Belgium	400.8%	652.0%	885.8%	167.7%
France	-2.4%	120.7%	-13.2%	-10.4%
Germany	432.2%	-0.1%	-59.8%	52.6%
Italy	0.4%	48.1%	-40.1%	-24.6%
<i>Others</i>	106.5%	-7.8%	-2.8%	11.1%
World	37.2%	55.7%	10.6%	12.2%

Source: Peru: Ministry of Agriculture. Office of Agrarian Information.

Regarding frozen asparagus and its main market in the USA, the highest rate of growth of export volumes was reached in 1995 (129%) followed by the 43% reached in 1999. In Spain, the highest rate of growth of volume exports was reached in 1996 (381%). The export volume rate of growth in that market since 1994 was not higher than 30% and in many years it was negative, so the activity cannot follow the average rate of growth obtained in the 1990-1994 period. It is important to mention that Japan is a market for frozen asparagus and in 1999 export volumes grew in 43% (Table 4).

Table 4
Frozen Asparagus: Volume export rate of growth by final market

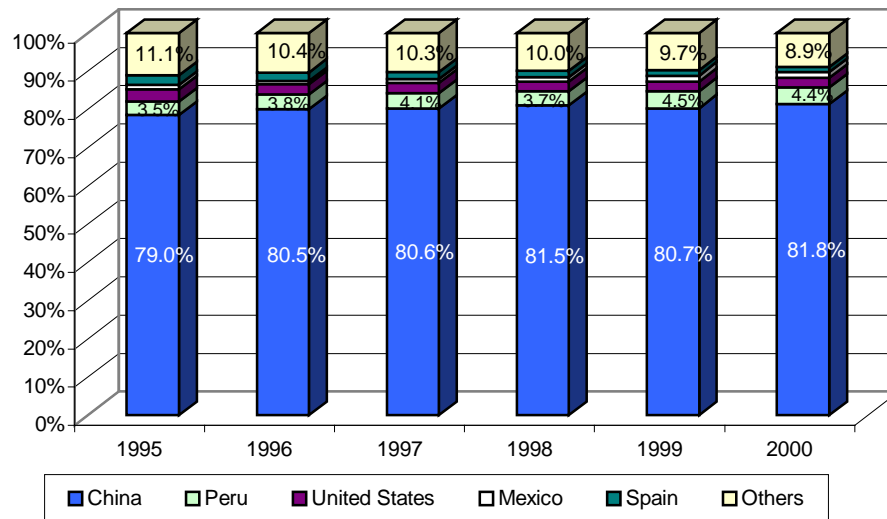
Years	2000	1999	1998	Average 98/94
<i>Countries</i>				
United States	13.4%	42.9%	17.7%	30.6%
Spain	29.8%	8.3%	22.6%	66.6%
Italy	27.4%	-11.5%	-15.2%	33.8%
United Kingdom	-40.6%	169.9%	-71.2%	34.2%
Japan	-58.7%	42.9%	-26.9%	7.3%
Germany	29.6%	-42.2%	-40.9%	-17.2%
<i>Others</i>	-47.0%	-36.3%	42.5%	2.0%
World	2.2%	11.1%	-4.7%	7.6%

Source: Peru: Ministry of Agriculture. Office of Agrarian Information.

Peru is the second largest producer of asparagus in the world. China is the first country and concentrates approximately 80% of worldwide production, followed by Peru with 4% (Graph 4). It should be also noticed that China's production increased by 7% during 1996-2000 period while Peru increased by 12%. Even though Mexico represents 1% of

worldwide production, it reported the highest annual average growth rate (15%) during the same period⁴⁴.

Graph 4
Asparagus World Producers



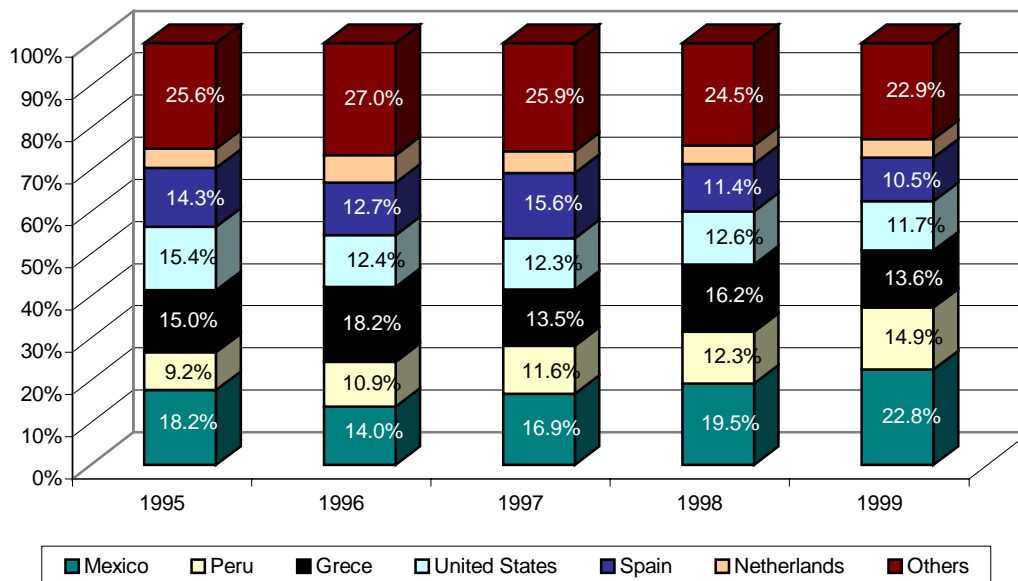
Source: Food and Agriculture Organization (FAO)

Although China is the first worldwide asparagus producer, Mexico is the first world exporter followed by Peru covering 23% and 15% of export volumes in the world, respectively (Graph 5)⁴⁵. Peruvian asparagus exports increased at an annual average rate of 20%, only surpassed by Australia (26%), which is the sixth largest exporting country with a 5% share. It is interesting to notice that, in spite of the increase in Peruvian asparagus exports, Peru is in fourth position in the distribution of the worldwide value of exported asparagus with 8% while Mexico and the United States represented 42% and 11% respectively in 1999. This reveals that Peruvian production is traded in highly competitive markets and reduced product differentiation.

Graph 5
Asparagus Main Exporter Countries

⁴⁴ See Annex 4

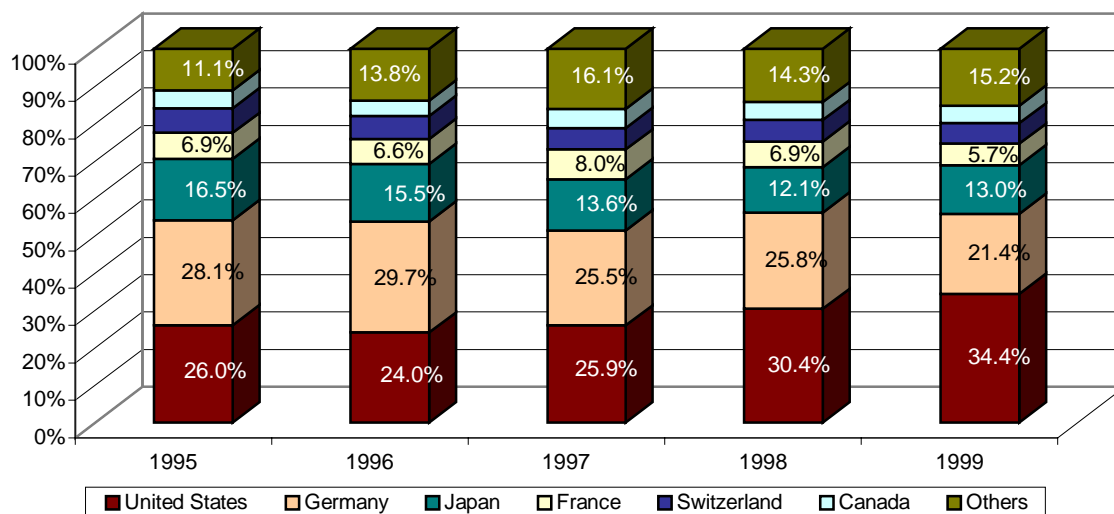
⁴⁵ According to FAO statistics China is the 9th exporter country, representing 1% of the worldwide asparagus volume exported.



Source: Food and Agriculture Organization (FAO)

The most important worldwide asparagus importers are the United States and Germany, which in 1999 represented 34% and 21% of worldwide imports. These countries are followed by Japan with 13% (Graph 6). American asparagus imports reported an annual average growth rate of 17% during 1995-1999 while other important markets reported negative annual rates, except the Netherlands (32%) and Canada (8%). An increase in American imports would be due to changes in American food consumption pattern in addition to a larger availability of this product at competitive prices throughout the year. It should be noticed that the Netherlands is an important re-exporter of food to the European market.

Graph 6
Asparagus World Importers



Industry Structure

In Peru, the asparagus industry is composed of 40 companies, 9 of which generate 30% of asparagus export value. Asparagus plants are mainly located in Ica and La Libertad (Map 1).

In this industry, competition is given under three production methods: canned, fresh and frozen asparagus. Fresh asparagus production and export presents a high volatility in the number of companies that enter and leave the market. On the other hand, the canned asparagus group has a stable number of companies. For the canned asparagus activity, during the second half of 1980, the number of companies increased and many of these left the industry during the first half of the nineties. This was due to the severe financial problems they faced during the new macroeconomic context, as previously mentioned.

Production structure of fresh asparagus is still being in a consolidation process. Companies wanted to enter to this market given the opportunity of the American market. However, competition in this market has increased not only due to the presence of a larger number of Peruvian companies but also the participation of other supplier countries has grown.

Therefore, Peruvian asparagus exports face higher competition in traditional markets. These markets not only demand product quality but also look for competitive prices.

The asparagus production system

This section presents the main characteristics of the asparagus production system in terms of raw material procurement, production, investment, trade strategies for the different products of asparagus export: canned, fresh and frozen. First, asparagus agricultural production characteristics are briefly explained, emphasising the number and size of producers and crop management in the main production areas.

Agricultural Production

In Peru, there are 1,764,666 agricultural units. 80% out of these are smaller than 5 hectares⁴⁶. The first National Census of Asparagus Producers and Plants carried out in 1998, reported 2,134 agricultural units cultivating asparagus with an area of 17,553 hectares. 69% of the producers have less than 10 hectares; 22% have between 10 and 50 hectares and 9% have more than 50 hectares. The latter have 56% of the total area of asparagus. In 1998, 76% reported that they used to cultivate asparagus because it was a profitable activity. 54% of producers are located in La Libertad. It is interesting to contrast that in La Libertad, 41% producers have less than 10 hectares and 35% have

⁴⁶ Information registered in III Agricultural Census, 1994. Peru: Ministry of Agriculture.

more than 50 hectares; while in Ica are located the largest producers who concentrate 72% of the total asparagus growing area.

Regarding the agricultural management, despite their size, 90% of the agricultural units use machinery; between 53% and 67% use improved seed, the highest percentage being among the largest units. Technical assistance is mainly used by agricultural units larger than 50 hectares (85%). With respect to the irrigation system, 88% use gravity irrigation while the large units (54%) use drip irrigation.

The national average asparagus yield is 8.64 MT/hectare, although there are fields that obtain between 15 MT/hectare and 18 MT/hectare. Experts state that in order to have a profitable crop, farmers must get a yield of at least 12 MT/hectare.

It should be mentioned that for asparagus cultivation, the concept of economies of scale is restricted. Economies of scale is the inverse relationship between production and average cost. Therefore, as production increases, the average cost of each unit decreases. However, experts explain that apparently 100 hectares is the largest area that can be properly handled. Larger areas could lead to higher costs as more labor is needed or the possibility of identifying and treating plagues may be slower, thus increasing the risk of losing the production.

Raw material procurement

Asparagus main exporters procure their raw material from self-production. Therefore they own or rent fields. Self-production provides between 50% and 98% of raw material requirements. However, in 2000, some firms reduced raw material procurement by self-production and used outsourcing, especially purchasing in the open market. This was due to an excess of asparagus supply that caused prices to decrease. Before asparagus production expansion (1997), agricultural asparagus producers used to receive US\$0.75 per kilogram of asparagus. Now, they receive between US\$0.50 and US\$0.40 per kilogram.

Furthermore, companies had to develop strategies to reduce costs due to price reductions of asparagus products in the final market. However, some companies where the concept of specificity of assets is used, as explained in the previous section, cannot reduce their supply from their own fields because such fields produce certified organic asparagus and therefore they do not have any substitute in the raw material market.

The main problem related to raw material procurement is the lack of homogenous quality that is due to the financial restrictions faced by producers. This limits the application of fertilizers and agrochemicals on time.

Therefore, certain changes should appear in the vertical coordination strategy through contracts and vertical integration. Raw material procurement through outsourcing has become important in company's behavior.

Production and investment

Canned asparagus production increased to an annual average rate of 7% between 1993–1999. Meanwhile, fresh asparagus production decreased 10% annually and frozen asparagus production increased 17%.

The main problem related to production of the different asparagus products is : access to financial resources is restricted. Some conservative companies have tried to finance their production with their own resources in order to reduce financial costs.

Some of the main exporters stated that, under a higher competitive context at destination markets, a way to develop a competitive advantage was investment in plant with the purpose of increasing production efficiency. This investment is expressed as follows: acquisition of environmental management systems (HACCP), increase of cold storage capacity, training programs for the staff about proper manufacturing practices. These investments, in some cases, were initiated in 1998 and in other cases were initiated in 1994 as a company's policy to strengthen its competitive position. IQF del Perú is an example of a firm that, despite the adverse conditions of the international market, could enter new demanding markets by developing products that meet the quality standards of such markets at competitive prices.

Trading strategies

Given the characteristics of each asparagus market: canned, fresh and frozen, companies had to develop strategies and alliances both internally and externally in order to reduce their vulnerability in highly competitive markets.

For canned asparagus, the main companies have guaranteed quality raw material procurement whether renting fields for production or signing contracts with a group of producers. We can clearly see a vertical integration strategy in the first case and a vertical coordination strategy in the second case. On the other hand, externally, they have alliances with important food distributors at destination markets (i.e. Navarra Food Industry in the Spanish market).

For fresh asparagus companies, some of these have developed alliances with their purchaser who invests in the field. Thus the client is involved from the production of raw material and periodically assesses that good practices of agricultural and manufacturing production are fulfilled. Another company based its investment on product differentiation, obtaining a certificated organic product that allowed it to take part in markets that pay a bonus for such products.

For frozen asparagus, one of the companies stated that based on the investment performed to offer a competitive quality product and the long-term relationships with their clients, they obtained the quality certification of their product at origin. Therefore, certification costs at destination market are reduced and their competitive position is improved, thus putting them a step ahead from their competitors.

Access to related services

Transport of raw material from the production areas to the factories requires the availability of refrigerated vehicles at competitive prices. Some companies even have their own trucks.

Particularly for fresh asparagus, companies agree that airplane capacity restrictions are reflected in high prices.

Opportunities, Risks, Strengths and Weaknesses of the sector

Peruvian asparagus exporting industry is completing a life span. It started with canned asparagus production and then diversified its production to frozen and fresh asparagus. A large number of companies have entered and left this industry during forty years of operation. Final destination markets have also changed, thus representing opportunities and risks for the sector.

Opportunities

- Consumers prefer fresh, natural, healthy and nutritional products.
- Purchasers and distributors at destination markets are interested in establishing long-term relationships with suppliers based on the provision of quality products, which production is carried out following good agricultural and manufacturing practices.
- Stable exchange currency policy.
- Favorable climate conditions.
- Mergers and consolidations of large food distributors demand significant volumes of quality products.
- Purchasers incorporate the concept of good agricultural practices within their quality product requirements.

Risks

- Increasing participation of competitors at destination markets.
- Changes in weather conditions affect asparagus production (i.e. El Niño)
- Capacity restrictions of airlines.
- Unorganized and poorly informed intervention of Peruvian public and private institutions that support the introduction of new participants in this activity.
- The trend among national investors to participate in activities that have sufficient participants with respect to the destination market size.
- Limited reaction of the corresponding authorities to develop an integral response to plagues.

Strengths

- Approximately 15 companies now better know their markets and have developed alliances and strategies to diversify their markets.

- Joint organization and investment of ten companies devoted to fresh asparagus export allowed the installation of a warehouse terminal for fresh products to maintain product quality. Additionally, this organization collects information for their members about quotations at destination markets, products export flow, etc.
- Investments carried out both in field infrastructure and factory, where some companies include environmental management issues.

Weaknesses

- The introduction of new participants to this market often does not correspond to a serious evaluation of the market. This causes distortions both in the raw material market as well as in the final market, creating inefficiencies in this sector.
- Limited diversification at destination markets of canned and fresh asparagus.
- Several companies in this sector are hardly concerned about the environmental issue.
- Delay in building effective spaces to exchange periodical commercial information allowing the improvement of competitive position at destination markets.
- Difficulties in obtaining commitments to joint action in the commercial phase.
- Scarce human resources for the agricultural management of raw material with an entrepreneurial perspective.

Learned lessons

The development of the asparagus industry is an example of the expansion and crisis of an activity that is considered the number one among non-traditional agricultural exports. This crisis is due to the decrease of prices at the most important destination markets as a consequence of greater competition between national and foreign producers. Additionally, asparagus products are exported to destination markets in a disorderly way.

Parallel to this, the expansion of cultivation areas without considering destination markets' size or their behavior through time, led to increase production based on the historical information, thus creating overproduction and causing the decrease of the purchase price of raw material. This situation affected small independent producers and large producers who faced a reduction in profitability. This fact also affected raw material quality as there were no resources nor incentives to produce high quality raw material.

The asparagus industry shows that companies that take decisions based not only on current, but future market conditions, can develop strengths allowing them to reduce the impact of crises on the firm. Therefore, investments not only depend on the market demand but on the development of strengths allowing them to improve their competitive position in the market. Investments oriented to improving product quality with competitive prices, to increase the capacity to offer larger volumes of products and to develop environmentally sustainable production systems, reveal a differentiated enterprise organization able to negotiate a strategic alliance under favorable conditions.

The main exporters state that the next two years will be years of adjustment. During this period, several companies will leave the industry - almost 50% of total enterprises is estimated. The most solid companies follow a conservative strategy of subsistence and minimized losses, waiting for a re-adjustment in the market where there will be a smaller number of companies.

The most important lesson of asparagus activity is that the expansion process of an exporting agricultural activity is temporary. There is always a crisis period that can be minimized by innovative companies. Such enterprises are those that allocate resources to introduce to new markets, to develop new products, to improve production efficiency, considering the compliance of good agricultural and manufacturing practices. Vulnerability will depend on the level of coordination, exchange of information and development of joint strategies. In a dynamic world of continuous changes, it is critical to establish strategic alliances.

From the interviews held with the most important exporters, we can conclude that the factors determining the operation of relatively successful enterprises in this market are basically internal. This means that the ability of a company's human capital to anticipate changes and to develop adequate strategies to properly react to such changes, helps its position in the market in spite of an adverse external environment.

Prospects

A decrease in agricultural prices will damage raw material quality, thus reducing raw material availability and hence the finished product. The gradual reduction of exported volume could allow the recovery of prices.

On the other hand, large companies do not plan to increase production given the reduced prices and some companies are planning to reduce the export volume to moderate market saturation.

Under unfavorable market conditions the asparagus activity becomes more vulnerable if some old problems remain unsolved such as airlines high tariffs that affect fresh asparagus costs, a sanitation issue is awaiting solution as, in most cases, the asparagus is fumigated at destination markets, thus raising costs, the need for an integrated control of plagues that includes reliable sanctions for infringers, it is critical not only for asparagus but also for different horticultural activities.

It is important that the government develop research as there is an important group of producers that have been left out of technological innovation, considering the adverse conditions that the raw material market has to face.

CONCLUSIONS

1. The new food consumption patterns show a consumer who is aware of health and nutritional issues. The consumer of fresh products is very concerned about health risks because of chemical residues due to fertilizers used on crops.
2. Peruvian agricultural exports represent 9% of total value of exports. The traditional group is lead by coffee that represents 35% of total agricultural exports. The product concentration on this group make agricultural exports very sensitive to international price fluctuations. On the other hand, the non traditional export group is composed of a variety of products that are produced in different regions of the country, however products from the coast area are the leading ones (i.e. asparagus, marigold). In 2,000, this group represents 61% of total agricultural exports. This product diversification is an opportunity to enhance market diversification based on the development of competitive advantages according to market requirements. As a result, the country could benefit from the multiplier production and employment effects in the local producer areas, contributing to a process of sustainable development.
3. A necessary condition for the development of non traditional agricultural exports is well prepared human capital , that can managed and develop strategic planning for the development of new products and the penetration to new markets.
4. The agribusiness companies, in a highly competitive framework, have as alternative to follow product diversification strategies to soften competition and make strategic alliances to help their growth process.
5. The asparagus export industry, based on canned, fresh and frozen shows a reduced market diversification. The principal markets are: USA (75%) for fresh, Spain (66%) for canned and USA (42%) and Spain (24%) for frozen. This situation makes the industry vulnerable to price fluctuations due to changes in demand or an increase in the number of competitors.
6. Peru is the second largest worldwide exporter of asparagus with 15% of the worldwide volume exported. However, Peru is fourth in the worldwide export value with 8%. That could mean that Peruvian asparagus exports are traded in markets with strong competition and reduced product differentiation.
7. Asparagus agricultural producers are mainly small, 69% have less than 10 hectares. Although most of the producers use improved seeds and machinery, technical assistance services are mainly contracted by big producers. In this sense, high quality raw material is limited.
8. The lack of high quality raw material make the companies follow a process of vertical integration. Besides, some companies establish vertical coordination with

the asparagus producers. However, due to the excess of raw material supply and price reduction in the destination markets, the exporters have decided to buy raw material in the spot market because there is plenty of raw material. The main problem is the lack of sufficient volume of high quality raw material because that production was raised under financial restrictions. It shows that adverse conditions in the destination markets tend to modify strategies that provide benefits in the long run.

9. The Peruvian asparagus export industry is in crisis, according to exporters, 50% of the companies will go out of business. So, those companies that made decisions to strengthen their competitiveness will survive this difficult time reducing benefits or minimizing losses, waiting for the industry to recover.
10. There is a challenge to become more competitive, and it applies to all the participants in the asparagus system. It involves the private and public sector. It is important to continue developing the cluster in order to be more efficient at all stages.
11. The evidence shows that those companies that make investments to improve their competitiveness through time and have human resources able to make adequate decisions under different contexts, will be the ones that overcome the crisis stage. So, one of the main factors of success of the companies is their well trained human capital committed to improving the performance of the firm.

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Peru: National Superintendence of Customs. www.aduanet.gob.pe

Royal Ahold. www.ahold.com

ANNEX 1

Female Economic Activity Rate (%)

Countries	Years		
	1988	1993	1998
United States	41,5	40,1	58,2
Netherlands	30,9	33,2	45,1
United Kingdom	38,7	34,2	52,4
Germany	45,6	34,7	61,9
Spain	24,3	28,4	36,9

Source: United Nations, Inform about Human Development 1990, 1996 and 2000.

ANNEX 2

Coverage of Royal Ahold in Food's Distribution⁴⁷

On May 27, 1887, Mr. Albert Heijn laid the foundations for what was to become a truly global food provider, Royal Ahold's. 113 years later this enterprise generates annualized sales of more than Euro 46 billion through institutional food service companies, increasingly through the internet as an e-commerce player and through more than 7,000 supermarkets, superstores, hypermarkets and other retail formats (including franchise stores) in 23 countries.

Nowadays, Ahold is a founding member of the WorldWide Retail Exchange, a web-based business-to-business marketplace established by 16 prominent US and European retailers to conduct a full range of e-commerce transactions, independently of each other, with individual vendors.

Main subsidiaries of the company by country:

United States

Ahold is the leading supermarket operator along the eastern seaboard based on sales with more than 1,000 stores in five operating companies:

Supermarkets Chain:

- Stop & Shop
- Giant-Landover
- Giant-Carlisle
- BI-LO
- Tops Markets

Sales: USD 20.3 billion in 1999, approximately 57% of worldwide sales.

Europe

Ahold is growing rapidly, with 5,500 stores (including franchise stores) in 10 countries:

Netherlands

Supermarkets Chain:

- Albert Heijn
- Schuitema

Sales: amounted to Euro 8.3 billion in 1999

Portugal

- Pingo Doce Supermarkets
- Feira Nova Hypermarkets

The Czech Republic

- Albert supermarkets (formerly Mana supermarkets and Sesam stores)
- Hypernova hypermarkets
- Prima mini-hypermarkets

⁴⁷ <http://www.ahold.com>

Poland

- Max Supermarkets
- Hypermarkets

Ahold entered into a partnership with the ICA Group, Scandinavia's leading food retailer with sales of approximately Euro 6.6 billion.

Ahold also runs wholly-owned operations in Spain and Poland.

Latin America

Ahold and local partners operate over 500 stores in nine countries.

Brazil

Bompreço (supermarkets and hypermarkets), the leading food retailer in the north-east of the country.

Argentina

Disco Supermarkets

Chile, Peru, Paraguay and Ecuador

Santa Isabel Supermarkets

Guatemala, El Salvador and Honduras

La Fragua, Central America's leading food retailer.

Asia**Thailand, Malaysia and Indonesia.**

TOPS supermarkets

Sales: Euro 476 million in 1999, approximately 1% of worldwide sales.

Acquisitions 2000:

Royal Ahold's subsidiaries acquire 56 supermarkets and eight sites from Grand Union (recently filed for bankruptcy) in USA.

- Stop & Shop acquires 36 supermarkets and 8 sites for future store development.
- Tops acquires 20 supermarkets.

Ekono, supermarket chain in Argentina.

Kampio, supermarket chain in Spain.

Superdiplo S.A., Spanish food retailer.

U.S. Foodservice, America's second-largest distributor of food and related items to over 130,000 institutional customers with sales for calendar year 1999 of approximately USD 6.5 billion.

Mea-De Wilde-De Loore, prominent Belgian foodservice company.

Bompreço, Brazilian food retailer.

Source: Web page of Royal Ahold. <http://www.ahold.com>

ANNEX 3

Asparagus: Rate of growth of the world production by world producers

Asparagus Production	Year					Average 95-00
	1996	1997	1998	1999	2000	
<i>Countries</i>						
China	12,5%	5,5%	5,2%	5,0%	7,9%	7,2%
Peru	18,0%	13,4%	-4,6%	26,8%	4,9%	11,7%
United States	-7,8%	1,9%	-2,3%	10,7%	2,1%	0,9%
Mexico	-18,5%	34,6%	8,6%	49,4%	0,6%	14,9%
Spain	0,9%	-15,3%	-5,0%	-6,1%	3,9%	-4,3%
Chile	-0,1%	4,3%	8,1%	0,6%	0,0%	2,6%
<i>Others Countries</i>	2,8%	4,0%	1,6%	2,9%	-2,4%	1,8%
World	10,4%	5,3%	4,1%	6,1%	6,5%	6,5%

Source: Food and Agriculture Organization (FAO)

ANNEX 4

Rate of Growth of the Value of Main Non-Traditional Agricultural Exports

Products	1991	1992	1993	1994	1995	1996	1997	1998	1999
First Four Non-Traditional Food Products									
Canned Asparagus	67,9%	20,5%	11,6%	2,8%	24,9%	18,8%	-0,5%	-14,8%	12,2%
Fresh asparagus	-100,0%		68,0%	24,3%	28,5%	18,2%	20,4%	11,9%	32,1%
Marigold flour	16,3%	111,7%	20,2%	-1,0%	-28,2%	7,1%	36,0%	-47,5%	153,1%
Cocoa butter	34,5%	-32,6%	14,5%	59,0%	49,0%	-9,3%	-10,4%	-6,8%	-11,1%
Non-Traditional Food Products of fluctuating growth									
Cochineal-Carmin	-6,0%	10,8%	-8,5%	53,3%	56,0%	-57,0%	7,6%	-35,4%	-11,8%
Cochineal Bugs	-54,2%	31,9%	-32,5%	14,6%	379,9%	147,2%	-17,9%	-56,7%	-18,7%
Cooked frozen vegetables				18,9%	7,1%	24,0%	21,2%	-4,2%	6,8%
Mangoes	-25,4%	272,7%	-23,4%	33,7%	-4,2%	71,6%	-22,4%	41,3%	98,0%
Dry beans	24,2%	32,6%	274,6%	77,3%	20,1%	-30,1%	1,7%	-29,4%	103,8%
Lemon Oil	16,7%	-16,5%	32,4%	13,2%	1,6%	2,2%	-9,7%	-53,3%	31,1%
Potencial Non-Traditional Food Products									
Dry Onion				12,3%	16,6%	33,3%	-28,1%	-23,9%	-29,4%
Brazilian Nuts	-23,6%	-32,5%	15,5%	44,9%	23,0%	36,6%	50,5%	-62,3%	129,3%
Tara	184,2%	51,4%	9,3%	-49,1%	-34,5%	-1,7%	41,1%	-3,4%	-16,0%
Flowers	28,5%	-13,2%	-38,5%	5,3%	28,4%	6,2%	19,8%	-36,2%	18,4%
Cocoa Paste	-41,1%	-25,2%	-55,7%	-95,7%	2200,0%	-4,9%	2,4%	-57,3%	-81,2%
Fresh Garlic	-33,0%	-32,1%	-72,4%	7,3%	135,0%	64,9%	-66,1%	-90,0%	713,4%
Prepared beans				31600,0%	66,1%	-26,0%	86,5%	129,5%	106,8%
Tomato paste	-82,0%	-79,3%	46283,3%	137,7%	-26,6%	-12,4%	69,9%	-48,3%	-7,8%
Maracuya Juice	123,3%	2,1%	-27,9%	-37,9%	-1,4%	70,2%	-40,0%	54,1%	90,4%
Olives	586,6%	-49,0%	127,1%	18,0%	61,5%	84,1%	28,9%	-21,9%	-38,0%
Wheat Flour				147,2%	-46,8%	-86,5%	-97,0%	3503,3%	44,4%
Yellow onions	-100,0%			93,2%	636,4%	424,9%	-46,7%	134,8%	60,4%
Potencial Non-Traditional Food Products (not included in the group of main food exports)									
Palmitos	141,5%	-44,2%	47,2%	-18,1%	144,3%	25,8%	22,5%	-19,8%	-35,0%
White Corn	-4,3%	-13,2%	24,2%	115,2%	-32,0%	-46,4%	6,1%	71,8%	2,9%
Grapes	-43,8%	-4,5%	168,7%	-18,2%	151,8%	171,7%	-30,0%	-45,9%	166,1%
Fruit juice				-25,3%	113,7%	-26,0%	79,4%	-81,4%	401,0%
Others	6,5%	-39,6%	-10,9%	167,7%	44,1%	-16,1%	49,0%	-28,9%	-2,3%
First 20 Products	20,3%	21,1%	22,9%	17,3%	22,2%	16,8%	2,6%	-18,0%	28,9%
Total	11,3%	-16,9%	7,5%	74,1%	34,9%	-3,6%	27,7%	-24,9%	10,3%

Source: Peru: Ministry of Agriculture. Office of Agrarian Information.