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RESEARCH BRIEF

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A PRO-POOR ANALYSIS OF THE ARTICHOKE VALUE CHAIN IN PERU

This report was prepared for USAID/Peru by the Greater Access to Trade Expansion (GATE) project with support from the Centro Peruano de Estudios Sociales (CEPES) under the USAID Women in Development (WID) IQC Contract No. GEW-I-00-02-02-00018-00, Task Order 2 in order to explore the artichoke value chain in Peru. The report uses a pro-poor and gender-sensitive analysis to examine the nature of production, the relationships between various actors in the value chain, and the terms and conditions of employment. With an emphasis on promoting pro-poor growth, the study aims to identify interventions that will improve market outcomes, raise productivity, and increase income for male and female farmers, day laborers, and agro-industrial workers along the chain.

In the early 1990s, a series of factors fostered the aggressive growth of agro-exports in Peru and led to the introduction of export-oriented artichokes in the coastal and highland regions. Artichokes have been produced on a small scale and in non-exportable varieties for several decades in the central highlands. Their production for export is relatively recent, though, and has benefited from favorable climatic conditions which allow for a longer growing season than that of competitors in Argentina, Bolivia, Chile, and Mexico.

Peruvian agro-businesses primarily located on the coast were among the first to diversify into artichoke production. Seeking a variety of higher value-added products that could diversify and complement their existing range of horticultural products for export, artichokes presented an attractive option: there was a growing demand for artichokes in Europe and the United States, they were suitable for production and processing in Peru, and they captured high value added. A series of government and private initiatives that increased the availability of irrigation infrastructure and improved ports and roads along the coast in Peru also benefited the coastal producers.

Beginning in 2000, artichoke production experienced a sharp increase. By 2006, the crop reached an export value (FOB) of \$66 million, placing it among Peru's top five agro-export products. During this period, artichoke production grew by 2,414 percent, the area under cultivation grew by 2,212 percent, and the total export value grew by 7,949 percent. This report estimates that the artichoke value chain currently generates the equivalent of 20,500 full-time jobs.

Although recent economic growth in Peru has had limited impact reducing high poverty rates in a sustained way, particularly in rural areas, the emergence of an export market for artichokes presents new prospects for promoting agricultural and rural development in Peru and expanding opportunities for the inclusion of resource poor farmers and workers in a dynamic and high value added market. The growth in artichoke production however, poses a series of new challenges for public policy and for development projects—particularly if policymakers are concerned with integrating small farmers, and women in particular, into the export chain. This research brief highlights some of the key challenges and opportunities associated with a pro-poor expansion of the chain.

METHODOLOGY

This report uses a variety of methodologies to conduct a socio-economic analysis of the incidence of costs and benefits in the value chain. The purpose is to examine ways to improve income distribution across the chain, increase productivity, and distribute the benefits gained from employment in the chain to a greater number of poor men and women workers and farmers.

The analysis adopts a pro-poor growth approach that explores the economic, organizational, and asymmetrical relationships that exist between the actors who participate in the various segments of the value chain. The report analyzes the income and value added generated in the value chain, the purchase and sale prices obtained by actors along the chain, and the potential economic spillovers secured by other sectors. It also presents several simple forecasts to explore the potential absorption of labor under different hypothetical scenarios of expansion.

Complementing the value added analysis, a “Sen Approach”^{*} was used to: explore existing entitlements and capabilities of actors along the chain, analyze opportunities for promoting and maximizing the inclusion of the poor (men and women), and identify ways to improve the terms of their participation and engagement in the chain. The report also explores the differential participation of men and women through a sex-segmentation analysis of the labor market, analyzing their diverse roles and contributions and uncovering the economic and organizational asymmetries that exist between the actors in the various segments of the chain.

A total of 159 producers and 144 workers were surveyed in September 2005 in order to gather primary data about their participation in the value chain.[†] Twenty six percent of the producers and 49 percent of the workers surveyed were women. The survey collected information about prices, costs, yields, employment, and remuneration throughout the chain. It was conducted in the four regions with the greatest concentration of artichoke production: Lima, Junín, Ica, and Ancash. In addition, 30 interviews were conducted with key informants from the private sector, the government, non-governmental organizations (NGOs), and international development agencies. Finally, this information was complemented by two focus groups, one with women workers and another mixed focus group with male and female farmers. The first focus group was held with 4 small and medium producers in Junín, and the second was conducted with workers from the Ica region.

THE ARTICHOKE VALUE CHAIN

Two types of artichokes are grown in Peru: the thorny artichoke and the thornless artichoke. The thorny artichoke (also known as *criolla*) has been cultivated for many years in the central highlands, primarily in the region of Junín. It is grown to supply a rather small domestic market, and is sold fresh to local intermediaries who deliver the artichokes to produce markets in a number of cities. With the expansion of the export-oriented artichoke market some producers are now also beginning to process thorny artichokes for export. Thorny artichokes are produced following the traditional production practices of highland producers: they are planted on a portion of land a farmer owns or rents, and are an integral part of his or her livelihood strategy for achieving food security and generating income.

Thornless artichokes, on the other hand, were introduced on the coast in the late 1990s in response to the increased demand for non-traditional agricultural exports. Subsequently the thornless artichoke was introduced in the highlands, where its almost 10 month harvest season, occurring in the second semester of each year, would complement coastal production of artichokes. Introduction of the thornless variety enabled small local producers to become involved in the export chain. Finding a viable way to link small farmers into higher value added production is particularly important in the highlands where the majority of the poor and indigenous are concentrated.[‡]

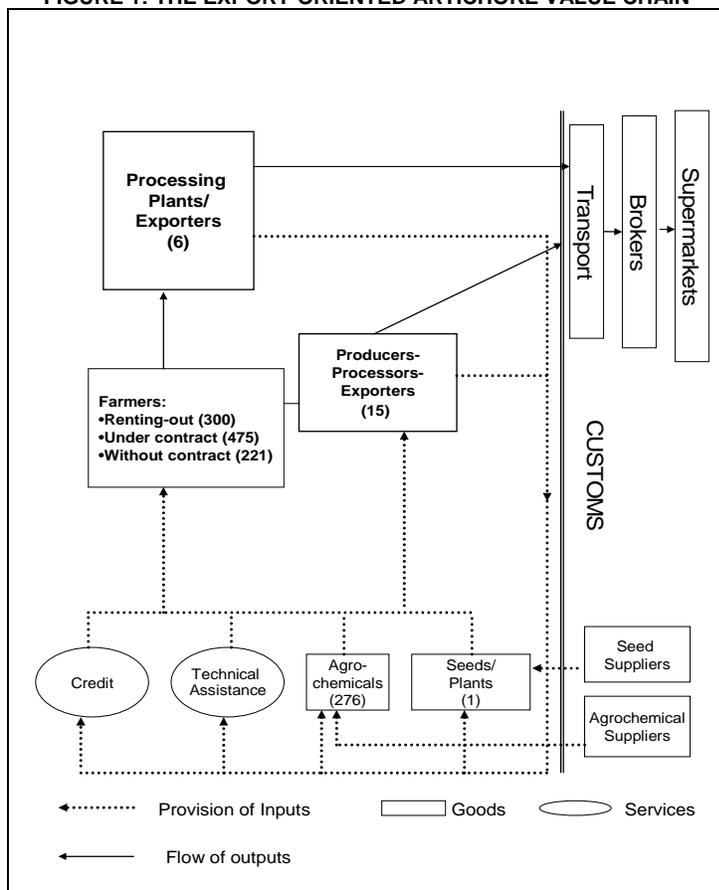
^{*} The analysis of entitlements and capabilities uses Sen’s theoretical framework (1999). According to Sen, entitlements are a bundle of resources that an individual or group possesses for purposes of consumption, production, or exchange. Capabilities, on the other hand, include the freedoms of an individual or group and their ability to use their resources.

[†] The final estimates of employment in the chain were based on the survey data as well as parameters from key informant interviews and secondary data from the Ministry of Labor.

[‡] The Highlands area reports poverty rates in excess of 57 percent, more than 17 percentage points higher than poverty in urban areas. Indigenous households where Spanish is not the primary language spoken at home report poverty rates of between 15 and 20 percentage points higher than non indigenous households.

The export value chain for artichokes, based primarily on the thornless variety, is much more complex than the thorny artichoke value chain because it requires processing and packaging before export (see Figure 1).

FIGURE 1: THE EXPORT-ORIENTED ARTICHOKE VALUE CHAIN



The artichoke value chain consists of the following actors:

Agricultural Producers. Artichokes are cultivated by a variety of producers with different sized plots of land and under different types of contracts. For the purposes of this study, farmers with more than 10 hectares of land are considered large producers. Medium-sized producers are those who have between two and ten hectares of land, and small producers are those less than two hectares of land. According to this definition, 3.5 percent of all producers are large producers; 28.8 percent are medium-sized producers; and 67.7 percent are small producers. Land-holdings in the chain are quite unequal. The distribution of the cultivated areas by size of producers reveals that large producers occupy about 56.2 percent of the total land dedicated to artichoke production; medium-sized producers occupy 17.4 percent; and, the small producers have 26.5 percent.

In addition to farm size, the producers can be categorized by four production modalities:

1. **Producers-Processors-Exporters.** There are 15 agro-exporters that cultivate land and process for export.
2. **Renter-Producers.** Export companies rent land, paying the owner a certain amount in exchange for ceding control of all agricultural activities. The activities are undertaken by technical experts and day laborers hired by the company. It is estimated that there are 300 renter-producers throughout the value chain.
3. **Contract Farmers.** Producers sign contracts with the processing plants to sell their produce at a fixed price or within an established price range and according to specific standards (size, shape, etc). Most of the producers in the highlands work in this way, selling to the three processing plants located in the region. Institutions like Caritas of Peru and the Poverty Reduction and Alleviation (PRA) Project have played a role facilitating the links between these processors and small and medium-sized farmers in the region. It is estimated that approximately 475 small and medium-sized producers throughout the chain operate under a previous commitment established with the buyer.
4. **Independent Farmers.** Artichoke producers without previously arranged purchasing agreements with agro-industry are considered to be independent farmers. It is estimated that some 221

* Since the standards are quite rigid, some contract farmers complain of significant wastage. Only 34 percent of the total volume cultivated is actually purchased in gross weight for processing. Of this, only 26 percent is retained in processed weight for export.

producers operate as independent farmers without contracts or prior sales commitments with agro-export companies.

Labor. Both the production and processing of artichokes are labor intensive activities. The export chain generates approximately 20,500 jobs per season, 51 percent of which are filled by women. Roughly 12,155 jobs are created at the production level. Of these, 9,521 are salaried and include farmers working on their own lands or laborers on land rented by agri-businesses located on the coast. (In the latter case, the workers are presumed to have rights to statutory minimum wages, and if they qualify through continuous employment, to health care and pensions benefits under the existing agricultural labor laws.) The remaining 2,634 full-time equivalent positions comprise remunerated workers, unremunerated family workers, and the informally employed on small and medium-sized farms. The 21 processing and export plants provide another 8,294 jobs per season, primarily in La Libertad and Ica. Approximately 48 percent of all workers on large farms are women, while on small and medium-sized farms women comprise only 27 percent of the workforce.

Service Providers (Credit and Technical Assistance). This category is made up of two types of services of particular importance.

- **Credit.** Initially, artichoke cultivation was financed through credits obtained by large companies already operating in the agro-export chain. In the highlands, however, many of the processing plants provide seeds, technical assistance, and credit. Credit is advanced or inputs are purchased and the cost of the credit or inputs is deducted from the final price paid to the producers for the artichokes. In some cases, the companies act as guarantors for government credit programs enabling small farmers to access credit through programs run by the Financial Corporation for Development (COFIDE).
- **Technical Assistance.** Both the domestic and export-processors often supervise the application of agrochemicals and guide the farmer throughout the cultivation and harvesting process. In the highlands, the processing plants provide technical assistance as part of a package of inputs that includes seeds, agro-chemical products, and credit. In return they require a sales commitment from the farmers at a previously agreed upon price or in an established price range. NGOs and donor-financed projects like the PRA Program and Caritas of Peru also complement these activities by facilitating access to other types of technical assistance including product development and marketing, and by linking farmers to processors.

Input Suppliers (Seeds and Agrochemicals). Thornless artichoke production adheres to a strict cultivation regime that requires farmers purchase a significant quantity of inputs. The two primary inputs—seeds and agrochemicals—are usually imported.

- **Seeds.** Agro-export companies' need to have a homogeneous and uniform product for processing has led to the widespread use of hybrid thornless artichoke varieties that are reproduced using seeds that are imported. In some cases, thornless artichokes can be propagated through grafting, using shoots and cuttings. The primary provider for seeds in Peru is the company SF Almacigos.
- **Agrochemicals.** The production process for thornless artichokes is quite sophisticated and requires the rigorous application of agrochemicals such as fertilizers and pesticides at specific points in time during the period between planting and harvest. The use of imported inputs requires a significant investment of time and resources by the farmer. In the first year, the cost per hectare of cultivating thornless artichokes is a little under \$300 more than the cost of cultivating thorny artichokes. Subsequently, this cost difference increases to as much as \$600 per hectare.

Processors and Exporters. Twenty-one enterprises in the chain process and export artichokes. Three of these enterprises (Sociedad Agrícola Virú, Camposol and Danper) report earnings that comprise over 77 percent of export revenues (f.o.b.). Most of the processors and exporters are found on the coast and fifteen of them also cultivate artichokes, while the six remaining enterprises only process and export. Of the six processor-exporters, three are located in the highlands.

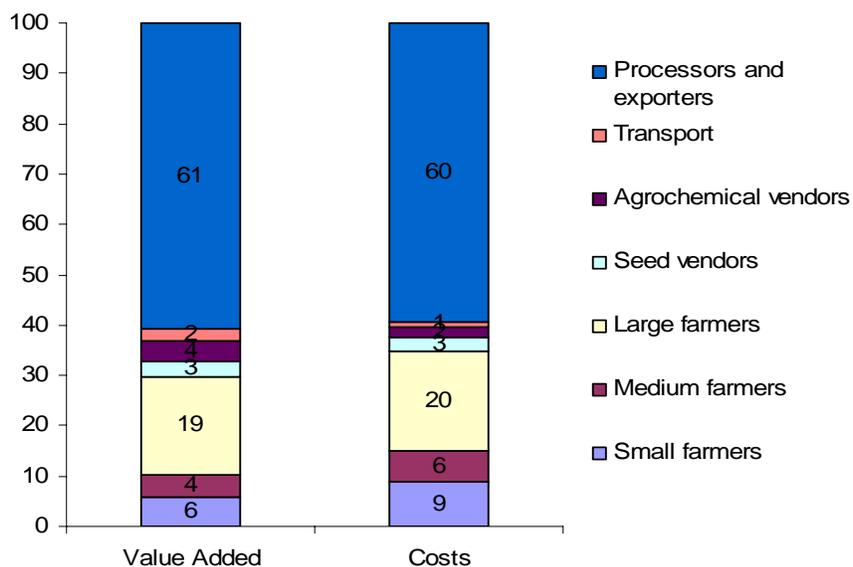
SOCIO-ECONOMIC ANALYSIS

This report calculates the value added and profit accruing to each segment of the artichoke export chain and provides estimates of employment and labor segmentation in the chain by sex in order to explore ways of increasing the profits reaped by small producers and improving the labor situation of the workers. These estimates are complemented by an analysis of forward and backward linkages in the chain to determine the economic “spillover” effects of the expansion of artichoke production and to explore ways in which the low income segments of the chain can increase their participation and capture a greater percentage of the value added.

Value Added and Profit. Yields and profits vary significantly in the chain with the larger farms on the coast securing the highest yields per hectare, while farmers in Ancash, Apurimac, Huánuco and Huancavelica report the lowest yields per hectare. Small farmers typically report lower yields than larger farmers and complain of greater wastage and loss from growing the thornless varieties of artichoke. Some small farmers obtain greatest profits from growing the thorny artichokes and selling to both agro-processors and local markets. The cost of growing thornless artichokes is significantly higher than the cost of growing the thorny varieties because of the use of purchased inputs and agrochemicals.

The distribution of value added is shown in Figure 2. Most of the value added is concentrated in the processing and export plants. It is estimated that approximately 61 percent of the total value added stays in the hands of the agro-exporters that carry out the processing activities. Approximately 10 percent of value added stays with the small and medium-sized farmers, and around 3 percent is attributed to the seed vendors. Nearly 4 percent goes to the agrochemical suppliers. Finally, an estimated 2 percent of the value added is captured by transport services from independent fleets not associated with the agro-export companies.

FIGURE 2. DISTRIBUTION OF VALUE ADDED AND COSTS IN THE ARTICHOKE VALUE CHAIN



As Figure 2 shows, the distribution of costs reflects similar percentages. Processors assume about 60 percent of the total costs in the value chain, while large producers incur about 20 percent. Six and nine percent of total costs are borne by medium and small producers respectively.

A comparative analysis of the price per kilogram in the export chain reveals that Peruvian farmers and processors capture only 24 percent of the final price for which artichokes are sold in the United States. The remaining 76 percent is distributed among shipping companies, insurers, wholesalers and retailers outside of Peru. One strategy for capturing a greater proportion of the final price and increasing value added is to diversify the types of processed artichokes. Increasing the “presentations” available such as producing salads, tapenades, and individually frozen (IQF) packets of artichokes for export is also likely to increase the value added and the final price. Although few processors have experimented with different

types of presentations, at least two of the Highland processors expressed an interest in diversifying their product presentation. Diversifying product presentation would involve some limited upgrading, training of workers and the installation of new machinery. The Highland processors who expressed an interest in diversifying the presentation did not think the costs associated with diversifying production were prohibitive. Additionally, diversifying the type of product offered may increase the volume of the artichoke plant used and reduce wastage and loss—particularly for small farmers and those processors with capital operating at less than full capacity in the highlands.

Value Added and Spillover Effects. The analysis of the forward and backward linkages shows that while strong forward linkages from farmers to processors exist, there are fewer backward linkages to other sectors. In the artichoke value chain, the majority of inputs like seeds, packaging, and agrochemicals are imported. As a result, the linkages with the national economy are neither very dense nor very broad, a fact that limits the size of the multipliers and reduces the spillover effects. The analysis also demonstrates that the actors with the greatest backward linkages in the value chain (small and medium-sized farmers) are also those that generally capture a smaller percentage of the total value added. Therefore, while there are denser links with the national economy lower down the chain, the spillover effects are not very great. The opportunities to maximize national content in the chain lie in the production of agrochemicals and in the use of local packaging materials for exporting the final product. The capacity exists to produce agrochemicals locally and also to produce organic supplements. Additionally, if more linkages are promoted and the sales price for small and medium-sized producers improves, the spillover effects could be amplified, with the potential to benefit the poorest sectors and actors.

The estimates of forward and backward linkages can be used to calculate the multipliers in the chain,[‡] adding the direct, indirect, and induced effects.[§] The direct effects are the immediate impacts on income or returns within the value chain. The indirect effects are driven by the purchase of inputs throughout the chain. Finally, the induced effects are changes experienced in other sectors due to an increase in the consumption expenditures of workers in the chain. In 2006, the estimated total spillover effects in the value chain were \$199.2 million. When these estimates are applied, the multiplier is calculated to be 1.82, which means that for each one dollar increase in income in the chain, some 82 cents are generated in final demand in the national economy.

This multiplier is not large and indicates that the economic spillover effects are quite limited.* A comparative analysis of the multipliers from a variety of domestic and export crops may help to highlight where and how policy and programs could maximize backward linkages and increase the economic spillovers from export agriculture.

Bargaining Power. For small farmers, becoming part of the value chain offers them the opportunity to improve their income by producing an export crop that is usually more profitable than their traditional crops of potatoes and corn. However, small artichoke producers growing thornless artichokes generally do not have much bargaining power when compared with other actors in the chain, which limits their ability to negotiate the terms and conditions of contracts with buyers. This is due, in part, to growing a new crop for which there is no local market and for which they must secure a buyer before beginning to produce. Consequently, small producers may end up accepting what they consider to be sub-optimal contracts with processors. A number of small farmers complained that they: did not understand the terms and conditions of the contract; encountered significant wastage (since processors can reject a substantial portion of their crop at purchase); paid too much for inputs; and, received prices that do not exceed those in the domestic market for thorny artichokes.

[‡] The multiplier analysis is based on the input-output methodology of Miller and Blair "Input-Output Analysis: Foundations and Extensions," Prentice-Hall, Englewood Cliffs, N.J., 1985 and of Song (et al). "Multiplier Analysis for Agriculture and Other Industries." Oklahoma State University, Division of Agricultural Sciences and Natural Resources. 2003.

[§] Booyong Song, Mike D. Woods, Gerald Doekson and Dean Shreider. "Multiplier Analysis for Agriculture and Other Industries." Oklahoma State University, Division of Agricultural Sciences and Natural Resources. 2003.

* Multipliers for agriculture typically range from about 1.2 to a little over 2.5. See for example Song et al. 2003, and Stanley. "The Economic Impact of Mariculture on a Small Regional Economy." World Development. 2003.

Organizing farmers into producer groups may provide small farmers with opportunities to negotiate better input and produce prices, capture economies of scale with suppliers and vendors, and secure more advantageous contracts with processors. Unfortunately, social capital in the chain appears to be weak. Small farmers in the highlands demonstrated significant reluctance to organize; with the exception of several groups that export processed tubers, few such farmer groups have formed or been successful. Notwithstanding, the Peruvian government is exploring opportunities to increase support for small farmer organizations through the *Sierra Exportadora* program.

Risk. Small farmers clearly produce a variety of agricultural products for sale and household consumption. They manage their livelihood needs and subsistence requirements alongside their need to generate income. Many small farmers in the highlands farm multiple and dispersed small plots some of which they own or rent-in. The fragmentation of land into numerous small plots reduces the farmers' ability to switch into higher return crops which require the careful and continuous administration of inputs and agrochemicals. Additionally, cultivating higher value added crops on small and dispersed plots in the absence of well-functioning producer organizations limits the farmer's ability to capture economies of scale. Finally, small farmers may not be able to bear the risk associated with shifting to a greater proportion of higher value added crops which require significant quantities of purchased inputs to secure higher productivity and greater uniformity.

Poverty and Capabilities in the Value Chain. Small farmers and laborers in the chains have low levels of entitlements and capabilities. Laborers are typically landless and small farmers were found to farm an average of 1 hectare of land. According to data from the Ministerio de Educación, average levels of education are particularly low in the highlands where less than 37 percent of Peruvians living in rural areas have completed secondary school. In our sample, 64 percent of landless laborers and 43 percent of all farmers had not completed secondary school. There was no significant gender difference in education levels for workers, with 63 percent of women and 65 percent of men having not completed secondary school. Small farmers possessed less formal education, with 51 percent of men and women having not finished secondary school. There was no significant difference in education levels of male and female farmers indicating that both are equally marginalized from education opportunities.

The poverty levels of artichoke producers were estimated using household food expenditures per capita and comparing them with the poverty line in Peru (measured in terms of the basic basket of goods). Poverty levels of up to 70 percent were estimated for agricultural day laborers and 67 percent for small producers. Although the small producers and day laborers are poor, they are less poor than those engaged in growing other products. This reveals that the poorest of the poor are not the ones who have been able to enter the artichoke value chain. Additionally, these poverty rates indicate that those who have entered the chain have not been able to significantly reduce their likelihood of being poor when compared with farmers and laborers cultivating other crops.

The opportunity to increase the benefits reaped by small producers in the value chain is currently limited by the fact that processors in the highlands make up only about 2 percent of the total value of exports (f.o.b.) within the chain. To date it is primarily these processors who have developed contractual arrangements with small and medium-sized producers.[†] A generalized expansion of the chain will not necessarily translate into the increased involvement of small producers in the chain nor will it guarantee an improvement in small producers' income. Nevertheless, the agro-export model that has been developed in the highlands—where small farmers are linked to agro-processing through the provision of credit and technical assistance—has the potential to be used strategically to increase the participation of small farmers, upgrade their capabilities, boost local and regional economies, and reduce poverty.

* Greater understanding of the impact of artichoke production on poverty levels would require panel and time series data to understand changes over time.

[†] Occasionally, processors from the coast come to the Highlands to purchase artichokes to cover any shortfall in their supply. This tends to drive up spot market prices and has contributed to some small farmers breaking their contractual agreements with the Highland processors.

Labor Segmentation and Informality in the Chain. The report also conducts a labor segmentation analysis to highlight the different roles and contributions of men and women throughout the value chain.

The artichoke value chain reveals consistent sex-segmentation by occupation, type of activity, and level of insertion in the chain. Artichoke production and processing generates the equivalent of some 20,500 full-time jobs, and women hold 51 percent of those jobs (see Table 1). Men and women cluster in different occupations, undertake distinct activities in the fields and processing plants, and work different hours with different degrees of security. The intensity of female labor increases in processing. Approximately 80 percent of the labor used in processing activities like peeling, cutting, and de-leaving is female labor, while men are more involved in the activities related to operating and maintaining the machinery.

In agro-processing (in the fields and processing plants) about 79 percent of all men and 84 percent of all women work jobs which do not guarantee them any job security. They are seasonal workers who are hired for specific periods of time and subsequently let go. A greater proportion of workers in the fields have insecure tenure than workers in the processing plants. Approximately 93 percent of women and 80 percent of men in the fields hold insecure job tenure and are hired and let go for periods between 1 and 3 months. In the processing plants, 70 percent of men and 60 percent of women face such insecure tenure.

Gender wage gaps are evident throughout the chain although more marked in certain segments. Women workers on small and medium-sized farms receive about 88 percent of men's wages. Women workers in agro-processing in the fields and on large farms earn equal pay with men, or occasionally slightly higher. In processing plants women workers without defined job tenure make 86 percent of men's wages and those who hold contracts for a specified time period make 93 percent of men's wages per hour.

TABLE 1. EMPLOYMENT AND WAGES IN THE ARTICHOKE VALUE CHAIN, SEPTEMBER 2006

	Men	Women	Total	% F	% Informal	F/M Wages
Farmers	6,890	5,265	12,155	0.43	0.82	0.98
Small and Medium-Sized	1,923	711	2,634	0.27	0.85	0.88
Large	4,967	4,554	9,521	0.48	0.82	1.01
Processors	3,152	5,142	8,294	0.62	0.64	0.94
Transport	57	3	60	0.05	--	--
Total	10,099	10,410	20,509	0.51	0.75	0.96

Source: CEPES/dTS survey

There appears to be a slight wage premium for the more insecure jobs in the chain. In some cases, greater job security means lower wages and larger deductions for social security and pensions. But workers with more job security are more likely to receive the statutory benefits their contributions are intended to secure. Workers without job security are less likely to be able to claim benefits for the deductions taken from their pay.

Informality in the chain refers to the absence of fixed contracts, the lack of statutory benefits, and labor insecurity. Under this definition of informality, an estimated 75 percent of workers in the value chain are informally employed, and in spite of the fact that many are on the payrolls, not all of them receive the statutory minimum wages and health and pensions benefits established by law. Their jobs are unstable (in part due to the seasonal demand for labor) and a substantial number of workers complain that their labor conditions are unacceptable (see Box 1).^{*} High levels of informality coupled with weak labor laws and insufficient labor inspections, contribute to limited access to benefits, like pensions and medical insurance, for workers in agro-industry. In spite of the fact that men and women workers are on the

^{*} Based on interviews with workers and personnel from Centro de Asesoría Laboral (CEDAL), Comisión de Derechos Humanos de Ica (CODEHICA), Asociación Aurora Vivar, Oxfam, Federación Provincial de Mujeres de Ica (FEPROMU).

payrolls, many do not receive the benefits that they are due. Although 47 percent of men and 44 percent of women workers who are remunerated report having social security payments deducted from their pay, a significant number of these workers claim that they are not able to access these benefits. The same is true of pensions' deductions for the National Pensions System (SNP) and the Pension Fund Administration (AFP).

BOX 1. WORKING CONDITIONS IN AGRO-PROCESSING

The workers interviewed complained of mistreatment in the processing plants and the fields. The majority was contracted casually for a period of days, weeks or months. There was widespread use of intermediaries or services to contract workers—particularly in the fields. These intermediaries recruited workers and transported them to the fields, shifting many of the costs of employment from the employers to the workers. The workers hired in this fashion paid for their transport and equipment:

“Equipment? Provided by the company? ... We take everything ourselves. If you don't bring it with you, there is no work for you.” Field worker, Ica.

“Or if you do get equipment, they charge you for it. For the boots you pay 15 soles and the day that they let you go you have to return them.” Field worker, Ica.

The transport provided by these intermediaries is frequently dangerous and insecure. Furthermore, once the field workers arrive at their jobs they are transported on farm vehicles that do not meet the requirements for safety required by public transport.

“They transport us to work in trucks, all crammed together. Two women fainted; and they just left them in the road.” Field worker, Ica.

The failure on the part of the Ministry of Labor to undertake sufficient labor inspections in conjunction with a limited budget contributes to generalized labor abuses and irregularities in labor hiring—particularly on the coast. The workers in the focus group conducted in Ica stated that while many of them were officially on the books and had their social security and health benefits deducted from their pay, they had not been able to access these benefits or found that they were not registered with the pensions and health-care services. Additionally, they complained that they were routinely not paid their overtime hours nor paid at the rate that they should have been compensated for overtime.

“We work more than 8 hours but they don't recognize that we do.” Field worker, Ica.

“They deduct the payments required by law. But it is a swindle. They [the employers] don't maintain a record of what they deduct from you. Or, if you go to the Administration for Pensions Funds (AFP) you find that you are not registered.” Processing plant worker, Ica.

“They made me work with false documents. I had to take someone else's documents. This was so that they wouldn't have to pay me more and so as to avoid paying overtime.” Agro-export worker, Ica.

Notes: This box distinguishes between workers who work in the fields and in the processing plants. An agro-export worker may work in the fields or in the processing plants.

Source: Key informant interviews and focus group with women workers in Ica.

OPPORTUNITIES AND CHALLENGES IN THE CHAIN

The emergence of export-oriented artichokes provides an opportunity for enhancing agricultural and rural development in Peru. Currently the benefits in the chain are highly concentrated and barriers limit the entry of small producers. At the macro-level, the report highlights the need for public programs and policies directed at improving road infrastructure and the development of dense networks of supply chains. Signing the Trade Promotion Agreement (TPA) with the United States will assist Peruvian exporters of artichokes in maintaining preferential access to US markets, thus securing a market for artichokes. However, a chronic deficiency in water-management threatens the expansion of the chain both on the coast and in the highlands. Improved water management will need to be fostered by good public policies and practices.

At the meso level, the *Sierra Exportadora* program presents one of the most interesting opportunities for the chain. The program includes an emphasis on linking small producers with sellers and buyers, a role of particular importance for agricultural development in the highlands. Since the majority of small producers are in the highlands, *Sierra Exportadora* offers the possibility of integrating poorer farmers into export chains and linking them to higher value added production. *Sierra Exportadora* also promotes collaboration between the public and private sector to conduct research and disseminate information on a variety of export crops with the aim of raising yields and improving technical assistance delivery to the producers.

Finally, at the micro level, the research identified opportunities for improving the existing functions and capabilities of different actors in the chain, providing technical assistance, and facilitating access to credit and other financial instruments. The report also considers the advantages of diversifying the packaging and presentation of processed artichokes. With a supply of products like tapenades, salads and frozen artichokes IQF style, processors will be able to obtain more profit and minimize wastage. If wastage is minimized, it will be possible to include more small producers, reduce their risk of entering the value chain, and increase the purchase price for the raw materials.

These opportunities notwithstanding, the report identifies persistent challenges for the expansion of the value chain in the highlands, especially given the desire to increase the participation of the small producer. Among the existing challenges for incorporating small producers continues to be their inability to bear risk; their lack of confidence in producer associations; concerns about how to promote and capture economies of scale and improve sale and purchase prices; the multiple, small and dispersed plots of land cultivated; and the shortcomings in the current contracting mechanisms.

CONCLUSIONS

The export-oriented artichoke value chain shows a great deal of dynamism in Peru. Exports have increased dramatically throughout the last ten years and there is potential for sustained growth. However, the participation of small producers in the value chain is minimal and localized in highlands, where there have been specific initiatives to incorporate them into the agro-export chain. In addition, while artichoke production has created job opportunities on the Peruvian coast, many of these jobs are informal and precarious. In order to expand the value chain to benefit poor men and women, strategies should seek to boost local economic development and maximize the benefits for small and medium-sized producers and workers who participate in the chain.

In order to maximize economic spillovers, efforts should be made to increase the density of the backward linkages and reduce the use of imported agrochemical inputs. Another strategy includes integrating larger numbers of small and medium-sized producers in the chain. Because the processing plants in the highlands are not operating at full capacity, the search for additional products that could be processed in these plants would also increase capacity utilization.^{*} In addition, the processing industry would benefit from diversifying the presentation of the artichokes, producing tapenades for example, in order to capture a greater value added nationally. Peruvian actors along the chain capture only 24 percent of the final price for which artichokes are sold in the United States. Raising the value added captured in the Peruvian links of the chain may increase the income accruing to workers and small producers.

A more pro-poor development of the chain requires the incorporation of producers who are less able to participate in the export-oriented production of artichokes and who would need support to overcome various deficits that limit their participation. If, as the *Sierra Exportadora* Program maintains, there is a potential area of 9,500 hectares of land for producing artichokes in the highlands, this would represent a 140 percent expansion when compared with the 6,769 hectares harvested for export in 2006. Coordinated action between public and private actors would be required to guarantee the sustainable and equitable expansion of the chain.

Furthermore, while the production and processing of artichokes on the coast offers opportunities for thousands of workers to insert themselves directly in the labor market, these jobs are frequently insecure and precarious. The agro-export sector's ineffective labor laws combined with inadequate government supervision, contributes to limited or reduced labor rights. This, in effect, transfers the costs associated with flexible and contingent hiring practices to the workers themselves. In spite of the fact that many workers are on payrolls, high levels of labor insecurity persist. Many workers complain about the lack of compliance with labor laws, the failure to pay due overtime, the inability to qualify for pensions, and inadequate equipment and protection. The individual and social costs associated with precarious

^{*} Some processors, most notably in the Highlands, are operating at less than full capacity. Estimates are that approximately 60 percent of the capital is currently being fully utilized over the course of a year.

employment are translated into risks for the workers; these costs are not being borne by the private sector but are instead shifted to the individual or to society at large.

The precarious nature of employment also affects women and men differentially. The perception that men are primary breadwinners can affect decisions about hiring female labor and may be used to justify casual and contingent labor for women. As casual and contingent workers, women are unable to formally enroll in the pension and health system; this undermines their wellbeing in the short and long term (especially since women have longer life expectancies) and also puts them at risk during their reproductive years. It is necessary to intensify efforts to guarantee labor rights for both men and for women, especially in light of commitments for improving labor conditions included in the Peru Trade Promotion Agreement.

RECOMMENDATIONS

The following table synthesizes policy and program recommendations emerging from the report. The matrix offers suggestions for improving income distribution, increasing productivity, and benefiting a larger number of the men and women who participate in the value chain.

**EXPORT CHAIN FOR ARTICHOKES:
POLICY AND ACTION MATRIX FOR DEVELOPMENT THAT BENEFITS THE POOR**

PROBLEMS	ACTIONS	ACTIVITIES	INDICATORS	GENDER INDICATORS	RESPONSIBLE AGENCIES
Low Productivity	Develop and promote the adoption of an appropriate technological package	<ul style="list-style-type: none"> ▪ Adapt low cost appropriate technologies that increase use of small-scale drip irrigation ▪ Train farmers in the optimal use of fertilizer ▪ Develop local irrigation tanks and systems ▪ Implement demonstration parcels in production areas. 	<ul style="list-style-type: none"> ▪ Level of information and adoption of appropriate technology packages ▪ Number of farmers with access to irrigation tanks ▪ Yields per hectare ▪ Reduction in wastage at point of sale 	<ul style="list-style-type: none"> ▪ Number of farmers trained (men and women) ▪ Number of women in leadership positions on irrigation control boards ▪ Increment in yields on farms/plots managed/owned by male- and female-headed households ▪ Development and adoption of appropriate technologies that do not increase women's time burdens. 	USAID through its programs INIEA MINAG <i>Programa Sierra Exportadora</i> La Molina National Agricultural University Regional and local governments COFIDE Irrigation Control Boards Private enterprises
Inappropriate use of agrochemicals	Regulate the agrochemical market Educate and raise awareness among farmers	<ul style="list-style-type: none"> ▪ Rigorous oversight of agrochemical sales and content ▪ Develop popular education programs for good agricultural practices ▪ Undertake research on the benefits of certification for organic production for small farmers 	<ul style="list-style-type: none"> ▪ Level of knowledge and adoption of good agricultural practices ▪ Increase in the number of farmers and associations following good agricultural practices 	<ul style="list-style-type: none"> ▪ Number of farmers trained (men and women). ▪ Number of farmers (men and women) with knowledge of good agricultural practices ▪ Number of farmers (men and women) following good agricultural practices 	USAID through its programs INEIA SENASA MINAG Private enterprises NGOs Network of Ecological Agriculture
Failure to comply with contracts and weak links between actors in the chain	Design simple and transparent contract mechanisms	<ul style="list-style-type: none"> ▪ Provide credit lines to small producers in producer organizations ▪ Develop training programs on the use of contracts ▪ Promote comprehensive production packages (credit, technical assistance, inputs and seeds) ▪ Forge commitments between businesses to provide incentives for compliance with contracts ▪ Foster contracts that allow farmers can sell part of their 	<ul style="list-style-type: none"> ▪ Simplified contract formats ▪ Placement of small producers ▪ Differences between market prices and prices stipulated in contracts ▪ Services covered by contracting companies 	<ul style="list-style-type: none"> ▪ Greater levels of understanding of contracts on the part of the men and women ▪ Credit given to farmers (men and women) 	USAID through its programs MINAG AGROBANCO COFIDE Cáritas of Perú

* In particular focus on the yield differentials and the feasible price increments.

PROBLEMS	ACTIONS	ACTIVITIES	INDICATORS	GENDER INDICATORS	RESPONSIBLE AGENCIES
		production on the <i>spot</i> market (immediate delivery and cash payments)			
Idle capital in the highlands	Promote cultivation areas and varieties of artichokes with less seasonality variability Design agricultural product portfolios that guarantee continuous movement of raw materials	<ul style="list-style-type: none"> ▪ Increase use of native artichoke in agro-exports ▪ Foster market linkages that encourage multipurpose processing plants in the highlands ▪ Diversify the presentation of the processed product 	<ul style="list-style-type: none"> ▪ Use of native artichoke in the value chain ▪ Increased processing of other products and vegetables (chili peppers, <i>aji</i> peppers, <i>pimientos</i> etc.) ▪ Diversification of product presentation 	<ul style="list-style-type: none"> ▪ Greater participation of women farmers in the value chain 	INIEA UNALM Private enterprises ADEX PROMPEX
Lack of organization in the value chain	Promote farmers organizations	<ul style="list-style-type: none"> ▪ Promote links between farmers associations, input providers, and purchasers to provide greater incentives for organization ▪ Promote economies of scale in the purchase of raw materials and inputs ▪ Condition access to the benefits of public programs (credit, public purchases etc.) on commitments to work in organizations ▪ Promote ties between government programs like <i>Sierra Exportadora</i> and small farmer associations 	<ul style="list-style-type: none"> ▪ Number of farmers who are members of associations ▪ Small farmers who are beneficiaries of programs like <i>Sierra Exportadora</i> ▪ Reduction of price per unit in the purchase of inputs ▪ Increase in prices received by farmers 	<ul style="list-style-type: none"> ▪ Greater participation of women farmers in the associations ▪ Greater participation of women in leadership positions in the associations 	USAID through its programs MINAG <i>Programa Sierra Exportadora</i> NGOs
High levels of labor informality in the value chain	Strengthen mechanisms for labor supervision Promote the formalization of employment in the value chain	<ul style="list-style-type: none"> ▪ Increase the number of labor inspectors ▪ Develop measures for agricultural and agro/- industrial workers to gain access to AFP (pension plan) ▪ Review and update labor laws in the fields of agriculture and agro-industry ▪ Invest in the development of greater state capacity ▪ Disseminate information on labor rights and 	<ul style="list-style-type: none"> • Number of workers on the AFP rolls • Number of workers on the Social Security rolls • Number of processing plants with agreements and certifications for fair trade or ethical trade • More random inspections 	<ul style="list-style-type: none"> ▪ Increase in the number of women in the value chain with access to AFP ▪ Increase in the number of women in the value chain with access to Social Security ▪ Increase in level of formalization within the feminized segments of the value chain 	USAID through its programs Government of the Republic of Peru Ministry of Labor Processing plants ADEX PROMPEX

* See <http://www.ethicaltrade.org/>

PROBLEMS	ACTIONS	ACTIVITIES	INDICATORS	GENDER INDICATORS	RESPONSIBLE AGENCIES
		responsibilities <ul style="list-style-type: none"> ▪ Train actors in the value chain on labor rights and responsibilities ▪ Promote fair trade through initiatives like the Ethical Trading Initiative (ETI) 	<ul style="list-style-type: none"> • Greater compliance with labor laws • Reduction in the use of informal recruitment mechanisms and labor intermediaries 		

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ABOUT THE GREATER ACCESS TO TRADE EXPANSION (GATE) PROJECT

The GATE Project, funded by USAID's Office of Women in Development and implemented by Development & Training Services, Inc. (dTS), works with seven USAID Missions to better integrate gender considerations into economic growth and trade-related programs in order to help expand areas of opportunity and mitigate the adverse effects of economic and trade expansion for poor women and men. This full report was produced for USAID/Peru by the GATE Project. The report was prepared by Guillermo Rebosio of the Centro Peruano de Estudios Sociales (CEPES), and Sarah Gammage and Cristina Manfre from the GATE Project.

To receive the full report, or for more information on other gender and trade-related research, please email GATEProject@onlinedts.com or call 703-465-9388.