

# Chapter 2

## The Diversification of Export Products: Expanding Non-Traditional Agricultural Exports (NTAEs)

### **Introduction**

For Latin American countries, which have tended to depend on exports of a limited number of primary commodities, the diversification of exports is an important task. Since the end of the 1960s, new agricultural products, destined mainly for export, have been introduced into the region. These are termed Non-Traditional Agricultural Exports (NTAEs).

In the process of economic liberalization during the 1980s and 90s, many countries shifted their development strategies from import substitution industrialization to export promotion. Along with trade liberalization, tariff rates were reduced and the costs of imported inputs decreased. At the same time, foreign markets became more accessible. This change facilitated modernization in their agricultural sectors.

The volume of NTAEs has expanded in many countries in Latin America. In some countries, the government took the initiative in carrying out research on potential export products, and played an important role in facilitating their production. In other countries, NTAEs were introduced by international aid agencies as a part of development programs. Foreign investors and transnational corporations also participated in the development of the sector.

As a result, the volume of NTAEs greatly increased during the 1980s. Since the value of NTAEs is much greater than that of traditional crops such as maize and wheat, many producers and exporters received large profits. However, not everybody gained from the NTAEs. While there are high po-

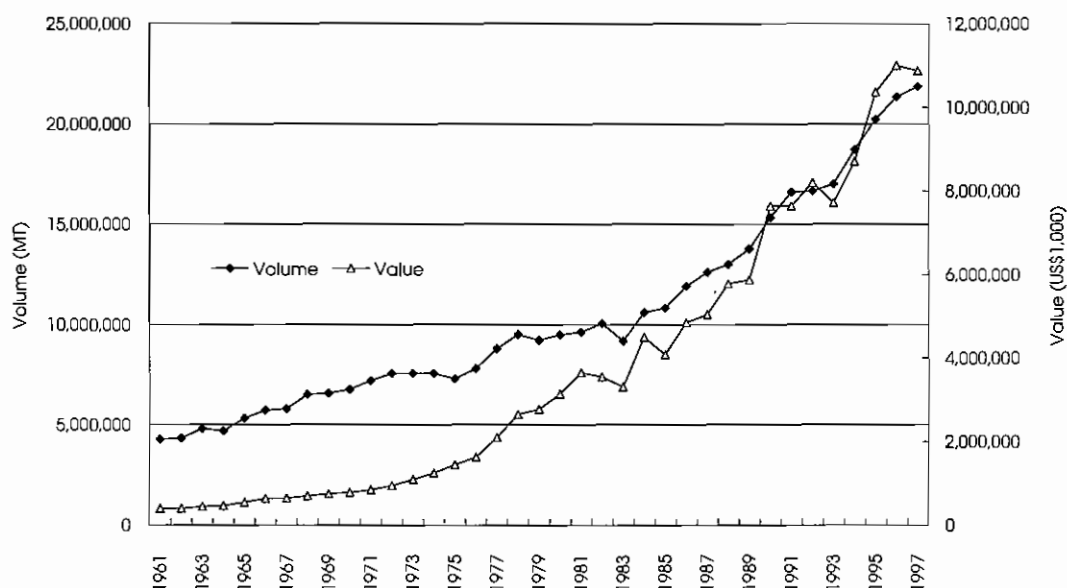
tential revenues for producers due to high land productivity and other natural resource endowments, the technological and investment requirements are also high and often exceed the means of small-scale producers. Thus, in practice, many have failed in the production of fresh fruits and vegetables.

This chapter is divided into three parts. Section 2.1 looks at the expansion of NTAEs and problems for further development, Section 2.2 discusses strategies for sustainable expansion, and Section 2.3 examines the current situation of agricultural exports in Peru.

### **2.1 The Expansion of NTAEs and Problems**

The term NTAE refers to agricultural products whose production and export has been promoted recently in an effort to modernize agricultural sectors and diversify export supplies. Some of the most important NTAEs in Latin America are fruits and vegetables. Figure 2-1 shows the export volume and value of fruits and vegetables from Latin America and the Caribbean. Since the 1960s, both export volumes and values have consistently increased. From 1980 to 1997, exports increased by 130% in volume, and by 247% in value. The fact that value is growing faster than volume demonstrates the fact that exports are shifting toward high-value products.

Among fruits and vegetables, the products whose exports are growing most rapidly are those that are consumed fresh, such as cauliflower, asparagus, melons, and grapes. For example, exports of melons from Central America tripled between the beginning of the 1980s and the late 1990s, in

**Figure 2-1 Exports of fruits and vegetables from Latin America and the Caribbeans**

Source: FAOSTAT

both volume and value. Grape exports from South America, for example, increased from 21,000 MT in 1970 to 556,000 MT in 1997. Similar trends can be seen for exports of cauliflower and asparagus (Table 2-1).

### 2.1.1 The Background of the Expansion of NTAEs

There are several reasons behind the rapid increase in exports of fresh fruits and vegetables. They include the geographical advantage of Latin America, developments in transportation and storage, and changes in consumer preferences.

Latin American countries are located in the Southern hemisphere, and thus the harvest period is different from that in the Northern hemisphere. Therefore, producers there can provide fresh fruits and vegetables at times of the year when they are not available in Northern markets. In addition, a stable temperature throughout the year in low latitude-area highlands allows temperate zone vegetables to be grown throughout the year. In addition, there are many varieties of tropical vegetables

that can only be grown in tropical zones.

The export of these products only became possible with the development of transportation and storage services. Through the use of air freight and "cold chains," in which the farm produce is kept refrigerated throughout the distribution channel from the farm to the supermarket, fruits and vegetables are delivered fresh to consumers just a few days after the harvest. For example, modern storage facilities in a suburb of Santiago, Chile, can maintain grapes fresh for several months, and apples for up to 12 months.

Changes in the preferences of consumers in the North are also one factor behind the expansion of markets for fresh fruits and vegetables. As the income level of consumers rises, they become willing to pay more for fresh produce that is not generally available during the off-season. Furthermore, they come to seek exotic produce, such as tropical fruits, which were previously unknown to them.

Although the major markets for NTAEs are in the developed countries of the North, the demand for NTAEs is also increasing in some developing countries. In the major cities of Latin

**Table 2-1 Export Value of Selected Fruits and Vegetables**

(US\$1,000)

Year	Name/ Origin	Melons/	Grapes/	Cauliflower/	Asparagus/	Asparagus/
		Central America	South America	Central America	Central America	South America
1961		7970	2515		123	
1962		8209	2686		156	
1963		4899	2551		187	
1964		9872	3118		215	
1965		12172	3184		179	
1966		11324	3132		231	
1967		10262	3049		204	
1968		6630	4414		251	
1969		9637	5365		331	
1970		11795	5760	432	599	
1971		12881	6203	1440	847	
1972		11852	6269	1778	837	
1973		11958	5463	2166	805	
1974		12339	6796	1951	1242	
1975		13715	15135	1684	1304	
1976		12836	17415	44	767	
1977		9450	23181	16	758	
1978		34779	33857	173	613	
1979		11202	49298	200	1273	
1980		61001	56188	369	1423	
1981		48779	74716	1200	1980	9
1982		30619	100967	600	3551	215
1983		9615	120844	208	4171	773
1984		2283	171159	250	2500	2363
1985		26532	217702	896	5460	2274
1986		51319	253279	277	6475	3832
1987		67112	221378	417	9352	3843
1988		57371	281831	4502	9014	4399
1989		112149	272677	9427	8272	3884
1990		93671	363708	9790	21650	4841
1991		132514	314154	8724	31904	5159
1992		115537	335203	11701	31939	12283
1993		98586	347106	25289	41131	19429
1994		119981	364889	20153	40492	23026
1995		134028	366561	36895	70058	28563
1996		118079	452653	37588	81557	35987
1997		181985	438641	43484	111961	41051

Source: FAOSTAT

America, large-scale supermarkets similar to those in the United States sell fresh fruits and vegetables, limiting their selection to ones in good condition, and washing and packing them into neat and attractive bags and boxes. These products are targeted at the urban middle and upper classes.

### 2.1.2 Characteristics of NTAEs

In comparison with basic crops such as maize or rice, NTAEs are very labor-intensive

products, and their land productivity is also very high. The revenue per unit of land of NTAE products is much higher than that of basic crops. For example, in Guatemala the production of snow peas yields gross revenues 15 times higher than that of maize. With the cultivation of NTAE products, a household can earn twice as much profit as with basic crops, and 1.6 times more than with traditional vegetables such as potatoes and tomatoes (von Braun, Hotchkiss and Immink 1989, p.11).

### **2.1.2.(1) Intensive Production and Aid Policy**

In addition, NTAE production is much more labor intensive than that of basic crops and traditional vegetables. In the areas of sowing, weeding, applying fertilizers and pesticides, and harvesting, NTAE products require very intensive care. Therefore, hiring waged laborers can be very costly and can eat into profits. Some also argue that waged labor is not suited for the cultivation of products that require intensive care, because it is difficult to induce such workers to make efforts without a proper monitoring system. On the other hand, when family labor is used, increases in profits as a result of intensive care can induce family members to work hard.

It is believed that this type of intensive production gives peasants with small parcels of land and surplus labor force the chance to improve their income levels. Therefore, international aid agencies such as the United States Agency for International Development (USAID) have promoted NTAE production in Central America and the Caribbean region during the 1980s.

### **2.1.2.(2) Contract Farming**

Although small-scale farmers are aware of the high profits that can be gained from NTAE production, in many cases they are unable to start cultivation because of a lack of resources such as capital and technology. The system of contract farming has received much attention as a means to solve this problem. Under this system, the buyers of the produce provide input materials, such as seeds, fertilizers, pesticides, and technical assistance, to the producers. At the same time, they sign a contract in which the producers agree to sell their products to the buyers, and the buyers pay them a predetermined price. After the harvest, the buyers give the producers revenue from the harvest, minus the cost of the inputs they provided. In theory, this contract farming system can make up for the deficiencies of the market.

Commercial banks often are reluctant to provide financing to the agricultural sector because they believe that lending to the sector is very risky. Harvests depend on unpredictable weather conditions, and it usually takes a year or more before the banks can retrieve the loans from the producers. The banks prefer to make loans to lower-risk sectors, where the loans can be recovered in a shorter period. In addition, small-scale producers often lack sufficient collateral to cover the costs of input materials.

Therefore, even though producers know that they can increase their income by shifting production from basic crops or traditional vegetables to NTAE products, they find themselves unable to make the change unless they can obtain financial help. With the system of contract farming, even small-scale farmers with few resources can start producing NTAEs. Thus, contract farming can make up for deficiencies in the financial markets.

Also, by signing a contract, the producer and buyer share the risks involved in the production and sales of farm produce. Since the sales price from farmers to buyers is fixed, the farmers only bear the risk of the harvest. The sales risk, that is the difference between contract price and market price, is born by the buyers. Therefore, thanks to the contract, producers can reduce risks and estimate their revenues more accurately.

Longer-term contracts can reduce transaction costs between producers and buyers. Since the producers know that the buyers will buy their products at a fixed price, they do not need to find buyers every year. At the same time, buyers can count on the producers with whom they have made contract to provide them with farm produce. Especially for buyers who are food processors, it is important to secure a continuous supply of high-quality material. Instead of buying materials on spot markets, in which quality, quantity and price may vary, the buyers can obtain a stable supply through contracts, thus reducing transaction costs.

### 2.1.2.(3) Satellite (Outgrower) Farming

In addition to contract farming, the satellite or outgrower farming system has been used for the production of NTAEs. Under this system, producers and buyers do not have a prior arrangement. After harvesting their products, growers look for buyers offering the best price. Although the buyers have little control over cultivation practices in this system, risk-averse buyers prefer to obtain the products through this system because it does not require any large investment. The risks associated with production, such as weather, pests, etc., and with sales, such as transportation and market prices, are borne by the farmers.

Through either the contract or satellite farming systems, the introduction of NTAEs was expected to contribute to the development of the agricultural sector and the improvement of income levels for small and medium scale producers in Latin America. However, it turned out not to be a great success for many producers in the region. In some cases, the introduction of NTAEs initially appeared to be successful, but the success lasted for only a few years. In the next few sections, we will introduce case studies from Central America and the Caribbean, in which development projects financed by the United States failed to achieve the sustainable development of NTAEs.

### 2.1.2.(4) Guatemala

In Guatemala, for example, the production of export-oriented vegetables, such as cauliflower, broccoli, snow peas and Brussels sprouts started in the 1970s (von Braun, Hotchkiss and Immink 1989, p.11). USAID, along with private companies and Guatemalan agricultural agencies, started projects to promote the production of those vegetables. They helped small-scale farmers organize cooperatives, provided financing for the purchase of seeds and other input materials, transferred technologies for cultivation, built storage facilities, and established export channels for the produce. A study on the project found

that it increased employment, including that for women and children. In addition, producers who obtained new cultivation techniques through the production of the NTAEs products applied these techniques to basic crops, allowing higher yields.

In addition to the aid agencies, private companies started operations in Guatemala. Hanover Brands, a U.S. food processor and distributor, established a subsidiary in Guatemala in 1976, called Alimentos Congelado. Initially, the company obtained materials from their own farms or from relatively large-scale producers. However, the company soon realized that the quality of the produce cultivated by small-scale producers was better than that from other sources, and shifted it purchasing from large-scale to small-scale producers. As a result, many small-scale farmers obtained higher income. Within a few years, new houses and shops emerged along the main street of that small town.

However, there were many other cases in which the expansion of production was short-lived. One involved the production of snow peas and broccoli. In the mid-1980s, the U.S. Food and Drug Administration (FDA) discovered that residual pesticide levels on these vegetables were much higher than the level the FDA permitted for agricultural produce. Instead of usual sampling tests, the FDA decided to examine all snow peas and broccoli from Guatemala. According to FDA statistics, from 1984 to 1994, a total of 18 million dollars' worth of Guatemalan farm produce, on 3,000 occasions, failed to pass the FDA examination (Thrupp 1995, pp.97-102).

In case of melons, another NTAE product promoted by the aid agencies for the Guatemalan lowlands, the harvest fluctuated heavily from year to year. When bad harvest persisted for several seasons, small-scale producers found themselves unable to afford to continue production.

### 2.1.2.(5) Costa Rica

USAID also promoted NTAEs in Costa Rica during the second half of the 1980s, through a project called "Agriculture of Change (Agricultura

de Cambio)" (Conroy, Murray and Rosset 1996, p.35). In the place of traditional crops such as beans and maize, farmers were encouraged to cultivate melons, squash, potatoes, cacao, broccoli, cut flowers, and other NTAEs. However, in many cases, the expansion of such products did not last long. One good example was a squash project in an area called El Indio. The project offered technical assistance, certified seeds, financing to purchase inputs, and sales contracts with an export company, to twenty selected farmers in the area.

In the first year, the gross revenues of these producers became up to forty times higher per hectare than their maize-cultivating neighbors. This success induced other farmers to plant squash in the second year. However, neither the certified seeds, nor the sales contracts were offered to the other farmers, and less technical assistance was given than in the first year. Many producers failed to achieve cultivation because of the poor quality of the seeds. Furthermore, the market price of squash fell in the U.S. market due to increased supply from other countries. Most producers who managed to cultivate the squash could not find buyers. As a result, 50% of the producers defaulted (Conroy, Murray and Rosset 1996, p.37).

### **2.1.2.(6) Dominican Republic**

In Caribbean nations as well, the promotion of NTAEs failed in many cases. During the 1980s, the U.S. Reagan administration started a development policy for the region called the "Caribbean Basin Initiative." One of its programs was the promotion of NTAEs. In the Dominican Republic, the production of oriental vegetables, such as Japanese eggplants, fuzzy squashes, bitter melons, long beans, etc., increased rapidly, and this success attracted foreign investment.

However, due to high pesticide residue levels, and an outbreak of thrips in the primary oriental vegetable-farming zone, many shipments to the U.S. market were detained and lost. During the 1989-90 season, losses to the whole industry were

projected to amount to between \$16 million and \$35 million.

### **2.1.3 Problems in Production**

Although NTAE production was considered suitable for producers with small parcels of land and abundant labor, there were several problems: high costs and risks, the weak position of producers, unequal distributions of profits, the intensive use of chemicals, reductions of basic crop production and unstable employment.

#### **2.1.3.(1) High Costs**

The production of NTAEs requires very large initial investments, and the cost of inputs is very high. In addition, cultivation technology is complex and new to producers accustomed to cultivating basic crops and traditional vegetables. In some cases, the initial investment for NTAEs is 15 times, and the cost of inputs three to four times those of traditional vegetables such as cucumbers, tomatoes and potatoes, and thirteen times those of maize (von Braun, Hotchkiss and Immink 1989, p.40). In case of Guatemala, production costs for one manzana (0.7 hectare) are \$220 for beans and maize, and \$650 to \$1,150 for cucumbers and tomatoes. By contrast, they are \$1,700 for Brussels sprouts and \$3,100 for snow peas (Conroy, Murray and Rosset 1996, p.128). Because small-scale producers are usually unable to borrow such amounts due to the lack of collateral, they cannot start NTAE production without help from the government or aid agencies.

#### **2.1.3.(2) High Risks**

The risks associated with NTAEs, such as failed harvests, drops in market prices, and the interruption of transport services, are also high. The high costs of initial investments and inputs can leave producers highly indebted when there is a bad harvest. In the case of traditional crops, seasonal price

changes can be forecast, and producers can prepare for changes. However, the prices of NTAEs in the international markets are influenced by various factors that cannot be predicted by the producers. In addition, because the value of NTAEs depends on their freshness, if problems emerge in the distribution channel and the freshness is lost before they reach consumers, their value can be totally lost.

If producers have sufficient resources, they can reduce these risks in various ways. For example, transnational corporations that engage in banana production own extra production fields in different areas and countries. If labor disputes, changes of government policy to the disadvantage of the corporation, deteriorations of economic condition, or pest outbreaks occur, the corporation can shift production to other areas and countries. In addition, holding the excess capacity can help the company to control the price in the market.

Small and medium scale producers in satellite or outgrower farming systems usually do not have the means to avoid these risks. Buyers and exporters purchase farm produce based on the current market price. In some cases, exporters pay the producers after selling the produce and deducting the commission and cost of freight. In these cases, both the risks of production and sales are borne by small-scale producers who have little information on the market. The buyers and exporters, can earn commissions without significant investment, and when the production in the area decreases, or the quality of the produce deteriorates for some reason, they simply leave the area and find new farmers who can supply the produce. As a consequence, the producers who have lost their market are left with nothing but large debts.

### **2.1.3.(3) The Weak Position of Producers**

The system of contract farming was supposed to help small-scale producers by allowing them to enter into NTAE production and by securing markets for their produce. In many cases, contract farming was introduced as part of develop-

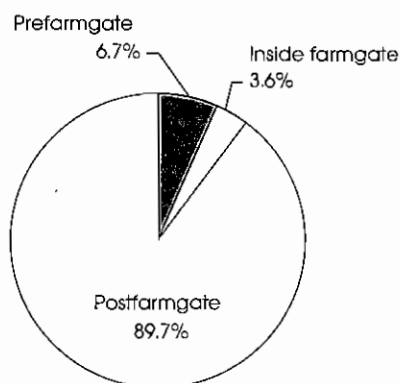
ment programs that aimed to modernize the agricultural sector and to increase farmers' incomes. Foreign and domestic private companies also introduced this contract system to promote production in the region.

In many cases, the projects were successful for the first few years. The producers' revenues increased dramatically compared to when they produced basic crops and traditional vegetables. Many other small-scale producers in the same area, who observed the success of their friends, also signed contracts and started NTAE production.

However, there have been breaches of contracts between the producers and buyers, and in many cases the buyers or the producers with more capital have been in a better position than others. As the supply of produce increases, the producers' dominant position as suppliers of scarce resources deteriorates. When the price on the spot market falls below the contract price, buyers have an incentive to purchase the produce from the spot market. In that case, they apply stricter quality standards than usual and try to reduce the amount they purchase based on the contract. On the other hand, when the price of produce on the spot market is higher than the contract price, it is the producers who have an incentive to breach the contract and sell their produce on the spot market. However, because people do not usually consume the NTAEs locally, demand and prices for the products on the local market are not very high. Few producers can independently access the outside market. Therefore, most producers have no choice but to sell to the buyers at the price in the contract, and the buyers gain by purchasing the products at low cost.

Although in theory the contract farming system appears to be beneficial for both buyers and producers, it is not so in practice because of information asymmetry between the two sides: the buyers, with large capital, have better access to market information than the small-scale producers; those with more information always have stronger bargaining power.

**Figure 2-2** Distribution of value added in melon commodity chain (melons from El Salvador, 1991)

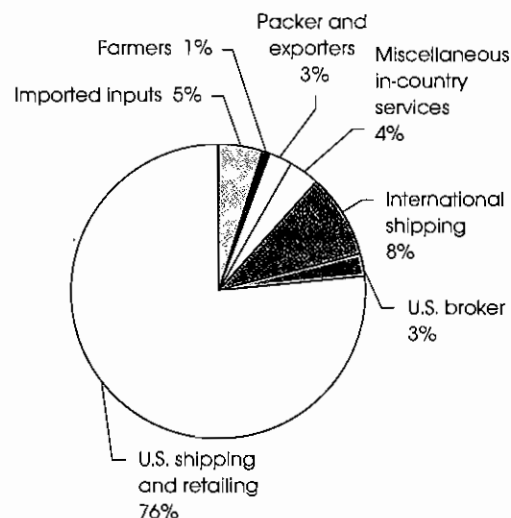


Source: Conroy 1996, p.105 (originally quoted from Caodas F., Roberto [1991]. *Exportaciones Agrícolas No Tradicionales de El Salvador: Producción de Melon de Exportación*. San Salvador: PREIS.

#### 2.1.3.(4) Unequal Distribution of Profits

The production of NTAEs and their distribution to final consumers involve many factors and processes. In a 1991 study on melons from El Salvador, the process was divided into three parts: prefarmgate, inside farmgate and postfarmgate (Conroy, Murray and Rosset 1996, p.104). Prefarmgate includes the manufacture of input materials such as fertilizers, pesticides, farm tools and equipment, seeds, etc., as well as services to finance inputs, such as bank loans or credit from buyers. Inside farmgate includes the farming itself, such as plowing, planting, weeding and harvesting. Postfarmgate includes all activities after the harvest and before the supermarket, meaning packing, freezing, transporting, wholesaling, etc. Among these three stages, the study shows that 6.7% of total value added comes from prefarmgate, just 3.6% from inside farmgate, and 89.7% from postfarmgate (Figure 2-2).

**Figure 2-3** Distribution of revenues in the melon commodity chain (melons from El Salvador, 1991)



Source: Conroy 1996, p.105 (originally quoted from Caodas F., Roberto [1991]. *Exportaciones Agrícolas No Tradicionales de El Salvador: Producción de Melon de Exportación*. San Salvador: PREIS.

The same study gives a detailed distribution of the revenue. One pound of Salvadorian melon was sold for 65 cents in the United States, with 76.6% of this going to U.S. shipping and retailing. A mere 0.6% was for the farmers' profit (Figure 2-3, Conroy, Murray and Rosset 1996, p.104). This analysis clearly shows that most of value added for the NTAEs is created not by the cultivation itself, but by the distribution, whose purpose is to find market demand and deliver the produce within a short period of time.

#### 2.1.3.(5) The Intensive Use of Chemicals

There are several negative effects caused by the intensive use of chemicals, such as pesticide. The first is the high cost of production. Studies show that in Ecuador's rose production, 35% of operating costs were for agrochemicals. In Guatemala's melon production in the late 1980s, \$735 to \$2,206 per hectare was used on pesticides. Pesticide purchase, application, and technical as-

sistance costs accounted for 22.5% of total production costs for NTAE vegetables (Thrupp 1995, p.96).

The second effect is losses derived from rejections of import into the U.S. market due to the excessive level of pesticide residues. The damage to Guatemalan producers was explained above.

The third effect is damage to the ecological system. Imported pesticides are generally very effective on their first use. However, as farmers apply them continuously, pests acquire resistance. In order to kill these pests, the farmers increase the amount of the pesticide, and the pests develop even stronger resistance. Some people call this vicious cycle the "pesticide treadmill." In some cases, the pesticide kills the natural enemies of the pests, and the surviving pests damage the crops. In other cases, the pesticide eventually kills the pests, but its excessive use induces outbreaks of other insects. Those previously harmless insects are upgraded to pests because the pesticide killed their natural enemies (Murray 1994, pp.37-42).

This was seen in the case of the Constanza Valley in the Dominican Republic. Once the agro ecosystem is devastated by the excessive use of pesticide, it becomes far more difficult to develop alternative integrated pest management strategies, in which natural enemies are skillfully utilized against the pests in the place of pesticide (Murray 1994, pp.79-81). In addition, outbreaks of pests affect not only NTAEs, but also the crops small farmers cultivate for their own consumption.

The fourth effect is health hazards. Many agricultural workers do not use proper protective gear when they apply toxic chemicals because they are not fully aware of the danger of those chemicals. As a result, they develop chronic symptoms such as headaches, allergies, dizziness, dermatitis, blurred vision, etc.

Buyers and exporters have taken some measures to avoid the problems caused by the intensive use of pesticides. Since they work with a large number of small producers, is not easy for the buyers to strictly control the producers' pesticide application practices. For example, when the pesti-

cides become ineffective, many farmers simply increase the amount they apply, contrary to instructions. In other cases, farmers fail to use the expensive chemicals provided as a part of the contract package. Instead, they sell them and use less expensive substitutes (Murray 1994, p.80). In order to tackle these problems, the companies have begun to send their own crews to farms and apply pesticides according to a schedule. Other companies have shifted purchases from many small-scale producers to a few large-scale producers. As a consequence, small-scale producers have lost buyers.

### **2.1.3.(6) Decreasing Basic Crop Production**

While the production of NTAEs increased in the 1980s, the production of basic crops such as maize, beans and rice decreased. According to a study by Conroy, Murray and Rosset (1996, P.31-32), per capita production of basic crops in Central America decreased from 1,100 pounds for maize at the beginning of the 1980s to 900 pounds at the end of the decade. In Guatemala, the production area devoted to wheat decreased by 20% in the 1980s.

One of the reasons behind the decrease was economic liberalization. During the debt crisis of the 1980s, many Latin American countries went through Structural Adjustment Programs. The government stopped subsidizing the agricultural sector, and abandoned guarantees for producers' prices. In addition, surplus crops from the United States flowed into developing countries as aid put downward pressure on the market prices of basic crops.

The concentration of government projects on the promotion of NTAEs reduced the resources available for traditional crop production. It became more difficult to obtain technical assistance and financing for crop production. For example, the credit available for basic crop production decreased by 40% from 1983 to 1987 in Guatemala, and by 70% in Costa Rica (Conroy, Murray and Rosset 1996, p.33). As a result, the profitability of basic crop production fell further and production itself decreased.

### **2.1.3.(7) Employment Instability**

The expansion of NTAE production is also associated with increasing instability of employment. NTAE products require large amounts of labor only at certain stages of production, such as weeding and harvesting. Therefore, producers hire only a few permanent laborers, and the rests are hired on a temporary basis.

In addition, the introduction of NTAEs has raised the opportunity cost of agricultural land. Small-scale producers without the means to enter NTAE production have sold their land, with some of them becoming day laborers.

According to a study on large-scale fruit farms in Chile, 85% of laborers had permanent employment in 1965, but the figure had decreased to 52% by 1980. Although fruit production is a highly labor-intensive industry, the introduction of new equipment, machines and chemical fertilizer reduced the number of farm hands necessary for production. At the same time, the government introduced a new labor law that made it easier for farm operators to hire temporary laborers (Collins and Lear 1995, pp.199-201).

## **2.2 Strategies for Sustainable Expansion**

### **2.2.1 Alternatives Suggested by Previous Studies**

Some measures have taken in Latin America to avoid the adverse effects brought by the expansion of NTAEs. Thrupp (1995, pp.115-134) wrote about some of the attempts by producers and exporters with help from international donor agencies. These are: strengthening financial sustainability, introducing integrated pest management (IPM), expanding organic production, and promoting organization and grassroots movements.

Business management training, market information services, and credit access have been integrated into NTAE promotion projects. In some cases, infrastructure and transport systems have

been built as part of the projects. However, as privatization proceeds in Latin American countries, the room left for aid agencies to provide financial support is growing smaller and smaller. This change may hinder the further development of small-scale producers.

IPM is an attempt to reduce the use of pesticides and avoid residue-related detentions of products and the negative effects on producers' health as well as on the environment of the region. For melon production in Honduras, techniques have included the introduction of plant barriers to keep pests out of the fields and the elimination of weeds and post harvest melon plants, which served as hosts for the pest populations during the off-season (Murray 1994, p.87). Guatemala has also focused attention on IPM. With support from USAID, it researches on IPM tries to apply it to snow peas, tomatoes, broccoli and other vegetables.

Growing demand for organic products in North American and European markets has favored the development of organic production. In addition, it is beneficial for small-scale producers to avoid adverse environmental and health effects, and moreover, consumers are willing to pay premium prices for the products, 40 to 70% higher than those for non-organic products in the United States (Thrupp 1995, p.123).

By organizing themselves, resource-poor farmers may be able to obtain greater bargaining power, and well-organized farmers can market their produce more effectively.

### **2.2.2 Management and Marketing**

Considering the alternatives suggested in previous studies, three points should be emphasized in order to make the expansion of NTAEs sustainable. They are: the improvement of management and marketing capabilities, organization of producers and exporters, and reexamination of the role of the public sector.

It is important to understand that the production of NTAEs is very different from that of tra-

ditional agricultural products. The production of basic crops and traditional vegetables does not require many inputs. Farmers use the seeds from the previous harvest. The application of fertilizers is minimal, and the cultivation technique is simple. Harvested crops are sold on the local market. By contrast, NTAE production involves many factors. To succeed, the farmer must be capable of not only cultivating the crops, but also managing related activities, from obtaining financing for inputs to finding secure and favorable markets.

While basic crops offer producers small but stable revenues, NTAEs offer chances to start new "businesses" and increase revenues. The revenues can be very large, but so are the risks. Once the new flow of capital and products is established, the producers can significantly increase their profits. However, in order to maintain high profits, they constantly need to improve product quality and explore new markets.

### **2.2.2.(1) The Dairy Industry in Argentina**

Although milk is not one of the NTAEs, one milk producer organization in Argentina may provide a good example of improving the management capabilities of farmers.

The members of an organization of dairy farmers in Buenos Aires province called Regional Consortium of Agricultural Experiment (Consortio Regional de Experimentación de Agrícola: CREA) have achieved high productivity in milk production. While the average milk production per hectare in the region is 74 kg, the CREA member farms achieved 210 kg (Casaburi 1999, p.107). CREA was founded in 1957, based on the model of cooperation among producers in France. It consists of a number of small local groups, with an average of 12 member farmers in each group. The objective of the group is to improve farm management by sharing information and experiences and seeking professional advice. Once a month, the members meet at one of the farms. The owner of the particular farm explains

the overall management during the previous year, including technical, managerial, and financial issues, investment decisions, tax payments, etc. The group also hires an agronomist who gives professional advice on issues of concern to the members. According to Casaburi, this sharing of information and experiences among farmers and the attempt to improve their management skills represents a "break with the traditional individualism of farmers" (1999, p.107). These farmers are well aware of how improving management capability can be beneficial to increasing productivity.

### **2.2.2.(2) The Cut Flower Industry in Colombia**

As explained above, the major part of value added for NTAEs is created after the produce has left from the farms. Therefore, marketing is a very important factor for producers and exporters to increase their share of the profit. The producers who gain large profit from NTAEs not only produce high quality of produce, but also find buyers who purchase their product consistently with favorable price. One of the successful examples of NTAEs development is the cut flower industry in Colombia.

Cut flower exports account for 4.6% of official total Colombian exports, and is the third largest agricultural product, following coffee and bananas. The value of exports, which was US\$976,000 in 1970, increased rapidly to US\$97 million in 1980, US\$229 million in 1990, and US\$477 million in 1995. The types of flowers produced there include roses, standard and miniature carnations, and pompon chrysanthemums. Roughly 95% of the products are exported, mainly to North America (80% of total exports) and Europe (15%). In 1994, 450 producers cultivated flowers on 4,200 hectares of land, and 75,000 people were employed by the industry, with an additional 50,000 being associated with related industry such as exports and the manufacture of shipping boxes (ASOCOFLORES 1995).

Until the 1950s, flowers were produced in the suburbs of the major cities of the North American

east coast, as they are highly perishable. Roses last three to five days, and carnations up to 10 days. The production of cut flowers requires great labor force for cultivation, harvest, sorting and shipment. As the cost of labor and the price of land increased around the major cities, and as the highway network developed, production sites moved away from the major cities toward Florida and California, and then to outside the country (Mendez 1991, pp.37).

Colombia is graced with favorable conditions for the cut flower industry. It is located near the Equator, and has more hours of sunlight than does North America. The temperature in the Bogota area is stable, and suited for flower cultivation. An unskilled and cheap labor force, consisting mainly of women, is widely available. A horticulturist from California first started growing flowers for export in the middle of the 1960s. The production cost for cut flowers was 30% lower than that in the United States.

In 1969, a group of businesspeople from the United States established a flower production and export company called Floramerica. It soon became a major success. Many Colombian groups followed in their footsteps, succeeding by copying the production and marketing methods of Floramerica. In order to transport their products to the U.S. market, growers and exporters convinced airline companies to make special arrangements for the shipment of the products. In addition, some established flower-handling companies in Miami airport so that their flowers could be kept refrigerated and in good condition.

Thanks to these efforts, the Colombian flower industry became capable of providing a wide variety of low-price cut flowers throughout the year. According to Mendez, this availability reduced the costs and risks associated with holding large inventories of flowers, and allowed non-florist outlets, such as supermarkets, to sell the products (Mendez 1991, p.11). Major supermarket chains in the United States, such as Krogers and Safeway, opened flower departments in many of their stores. Consumer demand was fueled by these changes.

These two examples show that improving

management capabilities and developing marketing channels are very effective measures for the development of NTAEs, and increase the value added for the producers and exporters.

### 2.2.3 Organizing Producers

Many NTAE producers are small-scale farmers with few resources. As individual producers, they are in a weak position vis-a-vis the buyers, with their large capital, in negotiating the terms of trade, such as sales prices. The same can be said about the relationship between local buyers and national exporters or transnational corporations. In order to overcome the problems arising from the weak bargaining power of small actors, producers and exporters can organize themselves. Casaburi discusses cooperation among producers and small companies as a way to generate collective comparative advantages or collective efficiency (1999, p.101).

The discussion of cooperation or organization among producers is not a new one. In the agrarian reforms of some Latin American countries, cooperatives were formed and given license to operate farms collectively in order to improve the efficiency of production, taking advantage of economies of scale. With the introduction of NTAEs, cooperatives were formed among Guatemalan small-scale producers, and they became the recipients of aid projects that promoted NTAE production. However, in many cases productivity failed to improve. Many small-scale Guatemalan producers went bankrupt. It seems clear that organization by itself is not a sufficient condition for the successful development of NTAE production.

In successful cases of organization, the members were well aware of the advantages and disadvantage of cooperation. For example, purchasing large amount of inputs as a group can reduce costs. Members can improve farm management by sharing information on cultivation techniques, market prices, government programs, etc. Producers are more likely to find buyers when they can supply their products, as a group, in a constant large

amount. Excellent examples of cooperation among producers and exporters can be found in the fruits industry in Chile, and the dairy sector in Mexico.

### 2.2.3.(1) Grape Exports from Chile

Chile is one of the world's largest grape exporters, along with the United States and Italy. Its exports have increased dramatically, from US\$1.3 million in 1961 to US\$402 million in 1998 (Figure 2-4). Its share in the world export market was less than 5% in the late 1970s, but by the 1990s, had reached 25% in volume and 20% in value. In addition to grapes, exports of fresh fruits such as apples, pears, peaches, nectarines and kiwis have been increasing in recent years.

There are several reasons why Chile is a strong exporter of fresh fruits. First, its location in the Southern hemisphere enables it to produce and ship fresh produce at times when it is not available in the major markets in the Northern hemisphere. Second, thanks to the long north-south extension of its territory, the country can produce a stable supply for a relatively long period by shifting the harvest from south to north, for example. In addition, its narrow territory makes access from fields

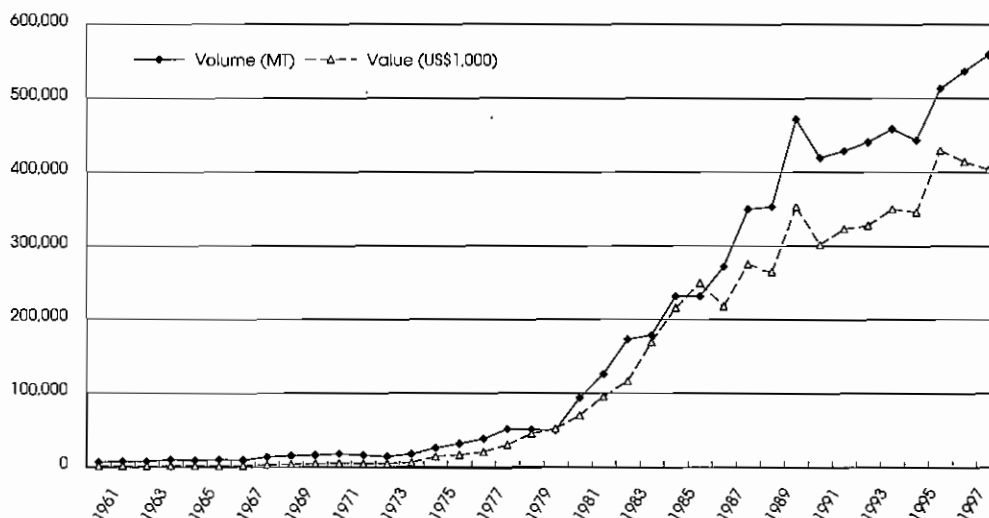
to ports easy. Third, it is surrounded by natural barriers, such as the Andes mountains to the east, deserts to the north, and an ocean to the south and west, making it free from pests and disease. Fourth, fruit production is a labor-intensive industry, and labor costs in Chile are cheaper than those in the industrialized countries in the North. Fifth, it is closer to the U.S. and European markets than other competitors in the Southern hemisphere, such as New Zealand and Australia, and South Africa was unable to gain access to many markets until the early 1990s because of its apartheid policy. A last and very important reason for its success in fruit exports is the stable macro economy and the exchange rate, which is favorable for exports.

### 2.2.3.(2) The Producers' and Exporters' Association in Chile

Because small and medium-scale fruits producers in Chile shared common problems, the objectives as the organization were clear when they formed an association.

In Chile, 15 major fruit exporters handle approximately two thirds of the total fruit exports. In general, the exporters maintain long-term relation-

Figure 2-4 Chilean Export of Grapes



Source: FAOSTAT

ships with producers. They provide the financing that the producers need for investment, and support cultivation by giving technical advice. In return, the producers sell their harvests to the exporters. After the exporters sell the products, they subtract the cost of marketing and a commission, and pay the remainder to the producers. Under this system, the producers bear all the risks of production and marketing. In addition, they are unable to obtain any information about the market situation once the products have left their hands. Producers have demanded that the exporters give them detailed information on the market prices and the costs, but the exporters have been unwilling to do so stating that the process was very complicated.

An organization of producers called FEDEFRUTA (Federacion de Agricultores de Fruta) has been pressuring the exporters to make the contracts more transparent (Casaburi 1999, p.121). The group published guidelines for producers to allow them to improve contracts with exporters by reducing uncertainty and increasing disclosure of information.

FEDEFRUTA has begun to publish prices paid to growers by exporters. With this information, the growers can find their own positions in the market, and gain a better position in negotiating with the exporters. Some growers have succeeded in adding to their contracts a clause stating that the price they receive must be no less than 10% of the highest price on the list, or within 5% of the average (Casaburi 1999, p.130). In addition, the organization is trying to eliminate a practice under which the contract is automatically renewed if a grower owes money to the exporter at the end of the season.

Not only producers, but also exporters have organized themselves in order to expand Chile's fresh fruit exports. The association of exporters is an interest group of fruit-exporting firms. Because there is no official quality control for Chilean fruit exports, the association has established voluntary quality norms for its members. Most of the exporters follow these norms, and this contributes to maintaining the high quality and repu-

tation of Chilean fruit exports.

The association is also in charge of the fumigation program for fruits. Many countries require strict phytosanitary controls for imports of fresh farm produce. The fumigation program was first started by the public sector, but later transferred to the association during the liberalization of the economy under the military regime.

### **2.2.3.(3) Milk Producers' Union in Mexico**

An organization formed by dairy farmers in Guanajuato, Mexico, can provide some hints on the benefits of cooperation among small-scale producers that can be applied for NTAE producers.

"Organization" is not something new for the Mexican dairy industry. Dairymen's associations have long existed at the local and state level. However, these associations only played bureaucratic roles such as issuing tax receipts and health certificates for cows that are required for their sale (McDonald 1999, p.43). Mexico is not self-sufficient in milk production, and is one of the world's largest importers of powdered milk. Because the government has kept the price of milk low, but has done little to help producers to modernize production, many small-scale producers using traditional production methods have been unable to modernize their production.

In the face of the implementation of NAFTA (North America Free Trade Agreement) as well as rising production costs and falling milk prices, dairy farmers in Guanajuato came to realize that they needed to take some actions in order to survive. They understood that it would be more profitable if they formed a group and sold their products directly to a milk processor rather than selling them individually to a middleman. They formed a cooperative called Dolores Hidalgo Milk Producers' Union in 1994.

One of the reasons behind this move was the search for a stable market for their products. The Danone de Mexico yogurt plant had been constructed in the same state, and was looking for suppliers of high-quality milk. Initially, the company purchased milk from Dolores Hidalgo through

middlemen, but had trouble with the middlemen because they adulterated the milk. The company came to the producers and negotiated with them. As a result, the milk producers organized themselves to produce high-quality milk, with the company buying the product at a fair price. To maintain the quality of the milk, the cooperatives invested in milk refrigeration tanks and pick-up trucks using government loans from the rural development bank.

The benefits of the organization were not limited to just marketing. By purchasing commercial cattle feed, medicine and fertilizers in bulk, production costs were reduced. The introduction of new technology was also facilitated. The group purchased Canadian cattle to improve the quality of their milk. Some members who milked by hand purchased gas-powered milking machine with a subsidy from the state government. The leader of the group is well informed about government projects, and sometimes researches commodity prices on the international market through the Internet. This access to the information has significantly improved the group's position (McDonald 1999, pp.51-54).

Many of the examples shown do not involve NTAEs, though the products have similar characteristics, such as being highly perishable, and having the major portion of value added created not by the production itself, but by the processing and distribution of the products. Therefore, these examples suggest some hints for the sustainable development of NTAEs even for small-scale producers.

#### **2.2.4 The Role of the Public Sector**

In the second half of the century, many Latin American countries adopted import substitution industrialization policies, in which the public sector played a large role in the national economies. However, the debt crisis in the 1980s revealed that public sector initiatives were not very effective for economic development. Neoclassical economic reforms became the standard prescription for recovery from economic crisis. Fiscal expenditures were cut and the presence of the public sector in the

economy was minimized. At the same time, currencies were devaluated and trade liberalization promoted. Chile started to liberalize its economy in the 1980s under the military regime, earlier than other countries in the region.

Although it is widely said that the success of Chile's export industries has largely depended on a stable macro economy and a favorable exchange rate for exports, the role of the public sector in the development of the Chilean fruits industry, which grew rapidly during the 1980s and 90s, has attracted a great deal of attention. The production of export-oriented fruits in Chile was first promoted in a government plan called the Fruit Development Plan (Plan de Desarrollo Frutícola) during the 1960s, which laid the ground for the development of the industry.

CORFO (Corporación de Fomento de la Producción) is a state development agency that formulated and carried out the fruit plan in order to "jump start" the fruit exports. The plan included the study of the foreign markets, phytosanitary requirements, the areas in Chile best suited for cultivation, etc. In order to develop basic infrastructure for fruit exports, such as packing, cooling and shipping facilities at ports, a public investment program was carried out. The agency also provided preferential loans to farmers who switched to the cultivation of fruits for export (Casaburi 1999, pp.35-36).

In addition, the government played an important role in transferring technologies by collaborating with the state of California in the United States. With the facilitation of the U.S. government's Alliance for Progress program, the University of California and the University of Chile started a 10-year technical collaboration program in 1965. As a part of the program, Chilean students studied fruit production at the graduate school of University of California at Davis. Meanwhile, faculty members of UC Davis were sent to Chile to give lectures and conduct research on fruit production in the country (Collins and Lear 1995, pp.188-189).

With regard to technology transfer, Chile Foundation (Fundación Chile), which is not a public but rather an independent entity, played a very

important role. The foundation has a unique origin. It was established in 1976 under an endowment of US\$50 million which had been originally donated by a U.S. corporation, ITT, expropriated during the Allende government, and later compensated for during the Pinochet regime. The foundation is dedicated exclusively to transferring technology to Chile to make use of its natural resources. The aim of its agribusiness section is to diversify agro exports. First, it identifies new products with potential markets, carries out research on their potential adaptation to the country's soils, and then transfers technology to farmers who wish to start growing the new varieties. In addition, the foundation gives advice on post-harvest handling, processing, quality control, investment and management, environmental program, etc. (Casaburi 1999, p.92-93).

In terms of the sales of Chilean products, Pro-Chile is very active in promoting sales in overseas markets. It was created in 1974, first as a public-private entity, and then converted to a public organization. Its function is to collect information on foreign markets and provide it to potential exporters, as well as to provide information on Chilean products to foreign buyers. In addition, Pro-Chile finances Chilean exporters who wish to exhibit their products at trade fairs in foreign countries. Some of the recent growth of Chilean wine exports is due to the continuing effort of Pro-Chile to improve the image of the Chilean brand.

The aim of neoclassical economic reform is to eliminate the presence of the public sector in the economy. However, as seen in the cases of Chile, the role of public sector in laying the long-term groundwork for industry, such as infrastructure, technology transfers, etc., may have contributed greatly to the development of the export industry.

## **2.3 NTAEs in Peru**

### **2.3.1 The Evolution of Agro Exports**

Peru's Ministry of Agriculture classifies the export of agricultural products into traditional and

non-traditional ones. The traditional products consist of coffee, sugar cane, and cotton. The non-traditional products include fruits, colorants and condiments (Table 2-2). In 1997, Peru exported US\$796 million worth of agricultural products, of which roughly 60% were traditional products, and 40% non-traditional products.

Peru's non-traditional agricultural exports expanded from US\$65 million in 1990 to US\$319 million in 1997. Some of the major NTAEs include asparagus, cochineal (a colorant), mangoes, marigold flowers, onions, and tomato paste. Most of the NTAE products are produced in the coastal area of the country, where the fields are irrigated, and access to the Pan Pacific Highway is relatively easy.

### **2.3.2 Asparagus Production**

One of Peru's fastest growing NTAE products is asparagus. Export of fresh asparagus grew from 461 metric tons (MT) and US\$600,000 in 1980 to 19,683 MT and US\$36 million in 1998. Together with canned and frozen products, total exports of asparagus products have expanded from 27,030 MT and US\$30,856 in 1990 to 78,775 MT and US\$113 million in 1998 (Figure 2-5, Ministry of Agriculture 1999).

Asparagus occupies an important position in Peru's exports of agricultural products. In 1998, canned asparagus was the second biggest export product, next to green coffee. Fresh asparagus was in fourth position, and frozen products were in eighth position. The total of these three products represented 18% of Peru's agro export in 1998.

### **2.3.3 The Economic Liberalization of the 1990s**

The expansion of some export products like asparagus has been partly due to the agricultural sector reforms carried out in the 1990s. Throughout the 1980s, stagnant productivity in the sector was a serious problem for the country. The productivity of major crops such as maize, potato, rice

and wheat failed to improve much, and for many crops production could not even catch up with population growth. The per capita production of some crops such as maize and wheat dropped during the decade. The following factors are considered to have hindered the development of agriculture: limited water supplies, price controls on agricultural products by the government in favor of consumers, and holdings and operations of farms

by cooperatives and communities. Therefore, improving productivity in the agricultural sector through modernization was an urgent task.

At the beginning of the 1990s, the Fujimori government carried out economic liberalization (Vasquez, 1996). In the agricultural sector, the distribution of major crops, which had been monopolized by state enterprises, was liberalized, and at present prices are determined by the market. Cus-

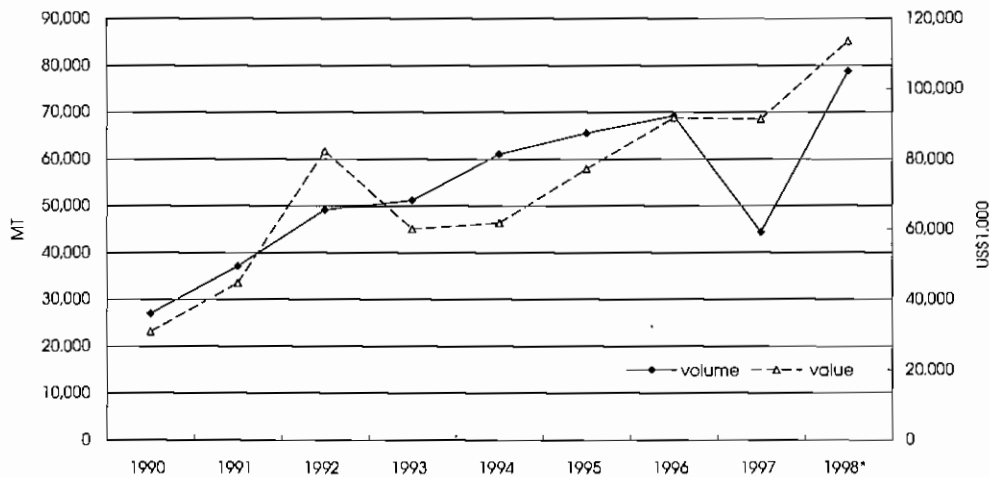
**Table 2-2 Peru's Agroexport**

(by volume, MT)	1990	1991	1992	1993	1994	1995	1996	1997	1998*
Asparagus	27,030	37,121	49,154	51,162	61,017	65,535	69,221	44,349	78,775
Canned palm heart	329	677	441	650	580	1,233	1,481	1,363	1,363
Onions	213	76	51	736	650	5,267	24,537	11,731	21,766
Tomato paste	203	36	994	3,221	7,826	5,879	6,169	8,954	4,657
Cocoa	6,759	6,346	6,461	6,713	4,900	6,767	7,570	5,521	5,591
Mangoes	2,483	2,173	6,574	4,984	7,374	7,876	12,168	8,021	10,541
Brazil nuts	1,504	1,104	1,027	1,067	1,394	1,613	1,951	2,667	1,096
Olive	816	1,151	1,064	931	1,185	2,586	4,573	7,787	4,016
Grapes	2,287	1,411	1,182	520	568	1,837	6,816	4,077	725
Lemon essential oil	317	649	929	2,707	3,880	6,055	7,644	7,511	30
Cochineal	230	176	229	175	173	259	416	361	386
Origanum	111	185	219	312	374	314	799	575	829
Marigold flour	5,482	5,239	7,110	9,771	10,815	8,814	7,695	10,378	4,666
Dried beans	1,800	1,640	2,246	6,487	13,216	16,669	12,280	10,925	8,219
Passion fruit juice	1,461	2,671	2,399	1,593	1,164	702	1,133	776	1,289
Fresh flower	2,559	3,256	2,423	1,294	1,032	1,197	1,151	1,254	986
Giant white corn	2,505	2,285	2,071	2,077	4,044	3,586	2,177	2,358	3,601

(by value, US\$1,000 fob)	1990	1991	1992	1993	1994	1995	1996	1997	1998*
Asparagus	30,856	44,727	82,241	60,106	61,802	77,220	91,764	91,304	113,491
Canned palm heart	667	1,611	899	1,353	1,083	2,646	3,328	4,077	3,270
Onions	632	936	1,110	4,380	4,323	6,655	13,103	8,444	11,064
Tomato paste	182	29	1,714	3,242	6,725	4,856	4,341	7,229	3,740
Cocoa	13,048	14,015	10,491	11,471	14,019	21,580	19,925	16,496	17,092
Mangoes	2,313	2,014	6,406	4,993	6,599	6,599	10,790	8,371	11,827
Brazil nuts	4,083	3,119	2,106	2,316	3,523	4,335	5,920	8,907	3,354
Olive	667	1,595	916	1,348	1,749	3,443	5,636	7,500	5,110
Grapes	434	244	233	572	512	1,289	3,503	2,419	1,326
Lemon essential oil	4,292	5,182	4,677	6,303	8,935	9,225	6,582	5,935	2,714
Cochineal	5,765	2,638	3,480	2,324	2,688	12,917	31,928	26,212	11,362
Origanum	125	219	390	955	1,029	603	1,017	990	1,723
Marigold flour	6,577	7,652	16,199	19,239	18,963	13,846	14,836	20,179	10,599
Dried beans	1,096	1,166	1,566	5,942	10,402	12,554	10,995	8,743	6,190
Passion fruit juice	1,513	3,379	3,451	2,474	1,546	1,524	2,594	1,556	2,398
Fresh flower	5,290	6,797	5,899	3,623	3,817	4,900	5,205	6,234	3,975
Giant white corn	2,020	1,933	1,677	1,859	4,423	3,049	1,634	1,734	2,979
Total NTAEs	65,446	112,652	140,965	185,124	223,746	273,029	331,505	318,870	268,692
Total agroexport	259,703	307,439	255,376	261,301	451,030	613,941	624,401	795,727	596,125

\* Preliminary

Source: Ministry of Agriculture

**Figure 2-5 Export of Asparagus from Peru**

\* Preliminary

Source: Ministry of Agriculture

toms duties on many agricultural imports were abolished or reduced. The state agricultural bank was dissolved, and loans to the agricultural sector were left to commercial banks and the rural banks (Cajas Rurales de Ahorro y Crédito), which are private financial institutions whose goal is to connect local savings to investment opportunities inside communities. The municipal banks (Cajas Municipales) whose shareholders are municipalities, as well as financial institutions run by non-governmental organization, play important roles in lending to the agricultural sector.

In order to facilitate investments in the sector, the agricultural investment promotion law (Ley de Promoción de Inversiones en el Sector Agrario) was legislated in 1991. The law permitted the purchase and selling of agricultural land, and allowed owners to use land as collateral for loans. Corporations were also given permission to own agricultural land, and cooperatives and communities were permitted to convert themselves into corporations based on the consensus of their members. These reforms aimed to facilitate highly productive agriculture operated by enterprises. At the same time, the creation of land market facilitates to convert lands into intensive and efficient operations.

A special program for the registration of land

titles was started in 1992. The objective was to transfer the ownership of land, which traditionally belonged to the state, to cooperatives and individuals, and thus to establish private ownership of agricultural land. By doing so, the government expected that private producers and corporations would gain incentives to make investments into their own land and improve productivity. According to the Ministry of Agriculture, most of the coastal region land had been registered by the middle of 1999, and the program itself will end by 2001.

### 2.3.4 Further Development of NTAEs

As mentioned in the above sections, the production and export of NTAEs has raised some problems for Peru's producers or exporters. Although the value of NTAEs is very high compared with traditional crops, the major portion of the profits goes out of the country to the international transporters and the distributors in the market countries. In order to improve the industry's profitability, some producers and exporters have started to organize themselves to improve management, transfer technology, and cooperate to build infrastructure, etc. Some examples of cooperation are presented below.

The Association of Agricultural Enterprises (Asociación de Empresarios Agrarios del Perú) is a private entity consisting of enterprises in the fields of agriculture, livestock farming, agro-industries and forestry. It acts as an interest group of member companies who are seeking to promote modernization of the agricultural sector. Through the media, it appeals to the government to promulgate appropriate laws and regulations on private property, water use, and exploitation of forestry resources.

One group organized in a specific sector of agriculture is the Peruvian Institute of Asparagus (Instituto Peruano de Espàrragos: IPE). IPE was formed in 1998, and consists of farmers with asparagus farms of 20 hectares or more. Processing companies are also members. The main objective of the institute is to collect technical and marketing information and provide it to its members. It publishes a biannual magazine, and organizes annual symposiums and seminars to promote the transfer of technologies and marketing information. In 1998, the IPE and the Information Office of the Ministry of Agriculture conducted the First National Census on Asparagus Producers and Processors in which over 2,000 producers in the coastal region were surveyed.

ProCitrus (Asociación de Productores de Cítricos de la Costa Central del Perú) is a similar group of citrus producers in the central coastal region. Some 70 producers, who together cultivate over 3,000 hectares, are working as a group to learn about post-harvest technology and marketing techniques.

An association called Frío Aéreo is another example of a group of asparagus and fruits exporters. Until recently, there were no reliable refrigeration facilities at the terminal of the Jorge Chávez International Airport in Lima. Each exporter stored its own products in refrigerated storage chambers outside the airport. Therefore, the cold chain was broken immediately before the products were loaded aboard the airplanes, and it was possible that the quality of the products might deteriorate. With help from PROMPEX, a government commission set up to promote Peru's export, the exporters, who

were mutual competitors, formed an association and invested nearly US\$1 million into constructing refrigerated storage facilities. The association began to offer storage services and standardized packing and shipping materials, thus contributing to a reduction of shipping costs. In addition, it launched a new system of statistical information to keep track of daily shipments and the quantity of projects to handle in the following week.

It appears that the economic liberalization of the 1990s has cleared many of the obstacles that hindered the development of the agricultural sector in past decades. However, as seen in the example of the development of the fruits industry in Chile, there is still room for the public sector to play a role.

The creation of the National Service of Agricultural Sanitation (Servicio Nacional de Sanidad Agraria: SENASA) shows the efforts of the Peruvian government in promoting agro-exports. At the beginning of the 1990s, the Ministry of Agriculture was restructured and downsized. In particular, the number of personnel at the National Institute of Agricultural Research (Instituto Nacional de Investigación Agraria: INIA) was slashed from 5,007 in 1990 to 449 in 1996. However, the newly-created SENASA was further strengthened during the period and now is working to eliminate fruits flies and foot-and-mouth disease.

Another role for the government has been to provide agricultural financing. After the shutdown of the Agricultural Bank (Banco Agrario) and state development financial institutions aimed at the agricultural sector, obtaining financing for agriculture has become very difficult. Many farmers do not have sufficient collateral to make investments into NTAE production, and even when they do have collateral, commercial banks are reluctant to lend them due to uncertainties regarding harvests and the long period needed for the recovery of loans. The government currently has plans to establish a private financial institution to provide financing to the sector, following the model of Mibanco, the financial institutions for small enterprises.

## Conclusion

Thanks to economic liberalization and technological progress in transportation, NTAEs have expanded in many Latin American countries. They have contributed to the modernization of the agricultural sector and benefited many producers and exporters. Although the potential of NTAEs products is high due to land productivity, cheap labor forces and other natural resource endowments, the managerial, technological and investment requirements are also high and often exceed the means of small-scale producers. In many cases, successes have lasted only for a short period, and many producers have suffered great losses and discontinued production, or have been forced to sell their lands.

To ensure the future success of NTAE development, three factors will be important: management and marketing, organizing producers, and the role of the public sector. It is clear that the production of NTAEs is completely different from traditional agriculture, and requires producers to possess modern management skills. Because most of the value added is created not in the production process itself, but in the transportation, distribution and sales, it is important for the producers to also think about marketing the products to increase profits. Another measure to increase the profits of the producers is for them to cooperate with each other. As a group, they can use the advantages of economies of scale to reduce the costs of input materials, improve productivity by sharing technical and managerial know-how, make efficient joint investments, and obtain stronger bargaining power in marketing their products. Although the presence of the public sector in economic activities has been significantly reduced through the recent economic liberalization, there is still room for it to play important roles in facilitating the development of NTAEs.

Examining the problems arising from previous cases of NTAE development, a few things can be suggested. The most important factor in the

development of NTAEs is building business management capacity among producers. The production and export of NTAEs is completely different from that of traditional agriculture. It is a new "business," rather than agriculture.

Latin America's experience during the 1980s demonstrates that the public sector is not a very proficient player in the process of economic development. However, as seen in the development of Chile's fruit industry, there is still room for the public sector to facilitate the agricultural industry. Especially, since the NTAE business is very different from traditional agriculture, the public sector can contribute to the sector's development by helping to identify potential products, train producers with managerial skills, and create systems in which the profits are distributed in a fair way.

In Peru, the economic liberalization that started in the 1990s presented opportunities for both NTAEs producers and exporters. Entrepreneurs and foreign investors have entered into the industry. Also, some producers have switched from traditional crops to NTAEs. The development of NTAEs has just begun in the coastal region, and the potential is still high. In addition, some producers and exporters have organized themselves and are cooperating to increase their shares of profit.

However, competition in the production of asparagus, for example, is getting more and more severe. Other countries in the region are also increasing their production. In order to keep NTAE development sustainable, it is important to continuously improve various aspects of the industry, from production to distribution.

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