WRI

DEVELOPMENT

CHALLENGES IN LATIN AMERICA'S RECENT AGROEXPORT BOOM

Sustainability and Equity Of Nontraditional Export Policies In Ecuador

by Lori Ann Thrupp

Growing global markets bring North American shoppers a year-round supply of fresh fruits, vegetables, and flowers, flown in from Latin America and the Caribbean. In the countries of origin, agribusiness in fashionable diverse "nontraditional" agroexport (NTAE) products is booming. In Ecuador, for example, the total value of NTAEs tripled between 1985 and 1991, reaching $35.9 million; and among the new crops, flower production has blossomed remarkably, increasing 15-fold in volume and 30-fold in value between 1985 and 1991.[1] At the same time, the growth of NTAEs is sparking enthusiasm among many investors and policy-makers. International aid agencies, especially the U.S. Agency for International Development (USAID), and local governments have been promoting these products in Latin America over the last decade, hoping to overcome economic stagnation and to add diversity to the "traditional" agro-exports of bananas, coffee, and sugarcane. *(See Box 1.)* The NTAE strategy is a key part of trade liberalization and economic restructuring.[2]

While these products are very profitable for some investors in the South and satisfy the appetites of many Northern consumers, this agricultural development strategy poses major challenges in terms of its economic and environmental sustainability and social equity. Indeed, NTAE growth is plagued by considerable uncertainties and problems. Evidence from several countries reveals that NTAEs have significant social and environmental costs and entail disturbing inequities and high risks. The problems are particularly serious for small-scale, poor farmers. They are also highly vulnerable to declining prices.[3] Some economic studies suggest that earnings from NTAEs are not "trickling down" to contribute to broad economic growth and alleviate poverty.[4] These socioeconomic and environmental outcomes are repeating patterns typical in some traditional agroexport crops.[5] They call into question the sustainability and equity of the NTAE sector.[6]

To help increase understanding of the progress and challenges of this sector, this report analyzes NTAEs in Ecuador, summarizing preliminary findings. The study is based mostly on field surveys, policy analysis, and discussion in multisectoral workshops. *(See Box 2.)* It analyzes the policies and institutional factors shaping the NTAE sector, identifes the environmental and socioeconomic impacts of NTAEs and the causes of problems, and suggests policy implications and recommendations to avert negative impacts and make agricultural development more sustainable and equitable. Ecuador has been largely neglected in previous NTAE studies, but this sector has boomed recently, bringing new opportunities and concerns. This analysis suggests a need for changes in agricultural development patterns to achieve sustainability and equity aims and identifies additional research needs.

Box 1: Definitions

Nontraditional agroexports refer to various agricultural products destined for export markets, other than the "traditional" export crops such as coffee, bananas, cotton, beef, and sugarcane. An export is considered nontraditional if it: 1) is not produced in a particular country before, such as broccoli in Ecuador; 2) was traditionally produced for domestic consumption but is now exported; or 3) is a traditional product but is now exported in a new market.[7]

Sustainability refers to the environmental soundness, economic productivity, and social suitability of a development strategy over the long-term. *Equity* refers to the equitable distribution of benefits in society.[8]

Box 2: Methodology

The methods used in the study were: Review and analysis of secondary data and literature; a field survey of 105 workers and 54 technical managers in NTAE plantations in the Highland region of Ecuador focusing on pesticide-use issues and environmental questions; a field survey of the majority of Ecuador's fresh flower producers for general production issues; systematic interviews with policy officials and analysts who are concerned with NTAEs, analysis of primary production data; multi-institutional workshops (in Quito and Guayaquil) in June 1992, to identify priority problems and opportunities of NTAEs; and a survey of 120 women workers in NTAE plantations and processing plants.

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I. BACKGROUND ON AGROEXPORT PRODUCTION

Export-led growth has a long history in Ecuador, as in many countries of Latin America and the Caribbean, dating back to the colonial period. The development model from the mid-1800s until the 1960s was based on the production and export of primary commodities, mainly cacao, coffee, and bananas. At the end of the 19th century, Ecuador was the continent's leading cocoa exporter.[9] In the 1950s, Ecuador became the world's leader in banana exports, a position retained until 1982.[10] Key features of this agroexport economy include large-scale, monoculture agriculture, relying on high inputs of chemicals, dependency on Northern markets and foreign capital, and the exploitation of low-wage workers and natural resources.[11] Ecuador's agrarian structure has long been characterized by highly unequal distribution of land and a gap between the export sector and the rest of the economy. The rural economy is marked by dualism typical in Latin America—the concentration of resources in a relatively small number of wealthy large-scale export producers (i.e., farms greater than 100 hectares) and the marginalization of large numbers of small-scale poor farmers (i.e., farms under 5 hectares).[12]

From the early 1960s to the late 1980s, Ecuador shifted to an inward-oriented model of Import Substitution Industrialization (ISI) as the external terms of trade and fiscal problems worsened. This ISI regime includes policies to stimulate local productive capacities, agricultural modernization through technological innovation, the centralization of enterprises, and the expansion of the State's role in regulating fiscal conditions. Yet, the economy has remained largely export-dependent. One significant element was the oil boom that began in 1972: it increased the nation's GNP by 51 percent between 1975 and 1985, and oil represented two thirds of all export earnings during this period.[13]

Through the 1970s and 1980s, the government still tried to support the growth of agricultural production and exports, but the production of basic food crops for the internal market and traditional export crops declined.[14] In the 1980s, Ecuador's economy faced increasing debt, poverty, socioeconomic inequities, and unemployment.[15] Hunger and malnutrition affected a growing number of the population. These problems were tied to the global economic recession and to the dramatic decline in the international prices of oil and traditional agroexports, as well as to the ineffectiveness of the ISI policies. Ecuador therefore fell victim to the characteristic "boom and bust" cycles that have historically shaped many Latin American export-dependent economies.[16] Reliance on monocultural export commodities made Ecuador's economy highly vulnerable and unstable.

At the same time, agriculture suffered from increasing deterioration of the natural resources upon which production is based. For example, severe soil erosion affects 12 percent of agricultural land in Ecuador, hindering fertility and productivity.[17] Deforestation of marginal land unsuitable for agriculture has also accelerated in recent decades, exacerbating resource degradation. Problems from misuse of agrochemicals have undermined productivity and created social costs.[18] These environmental predicaments have aggravated the impoverishment of rural people.

During the 1980s, the state enacted various policies and measures in response to the problems. Under President Borja, for example, the government attempted to control inflation, continue protecting national producers, and meet the poor's welfare needs. But such efforts were thwarted by numerous constraints, including pressures from international agencies to repay the debt, which reached $12.4 billion in April 1990.[19] Clearly, Ecuador's crisis has interlinked economic, social, political, and environmental elements.

II. DEVELOPMENT OF NONTRADITIONAL AGROEXPORTS

A. The emergence of policies and institutions for NTAEs

Struggling to overcome the crisis in the rural sector, institutions have tried to build new development strategies and policies. Some groups have promoted local food security and agricultural strategies that emphasize meeting the poor's needs and/or goals of environmental sustainability. On the other hand, international financial agencies and government institutions have supported export-based agribusiness and structural adjustment. Given the immediate pressures for debt repayment, such policies have been predominant in the late 1980s and 90s, while sustainability concerns became secondary. The emphasis on export-based growth is linked to attempts to open markets and to liberalize foreign trade. The development of diverse nontraditional crops is a central part of this strategy supported by international agencies.

A notable example of the expansion of nontraditional exports is in coastal shrimp production. Ecuador had become the second largest exporter of shrimp in the world by the 1980s.[20] More recently, most attention has been focused on such high-value crops as flowers and fresh and processed fruits (particularly mango, melon, pineapples, passion fruit, and strawberries) and vegetables (mainly broccoli, asparagus, small squash, and artichokes). Wood products and manufactured goods from *maquiladora* industries (where parts are assembled into final products) are also being promoted.

The main purposes for supporting NTAEs are to generate foreign exchange to repay debts, to diversify crops to reduce dependency on the low-priced traditional export crops, to increase employment (particularly jobs for rural women) to build private enterprise/agribusiness and to revitalize economic growth.[21] In Colombia and Bolivia, where narcotics production is prevalent, another motivation of development agencies is to develop NTAEs as high-value alternatives to coca. The NTAE strategy is also seen as a response to the

demands of Northern consumers for fresh produce year-round.

International development and aid agencies, particularly USAID, are the main supporters of the NTAE strategy in Ecuador, as in many other developing countries. In 1984, AID dedicated $2.8 million to Ecuador to develop the Program for the Export of NonTraditional Agriculture (PROEXANT) and $7.5 million to banks for NTAE credit.[22] The main purposes of PROEXANT are to promote production and marketing of NTAEs. PROEXANT's central programmatic activities are policy dialogue for the development of export facilitation laws and for other aspects of state support, promotion of marketing and investment through trade conferences, communication and promotional services on NTAEs for foreign investors, market development research, control of quality and post-harvest management, and technology transfer for agricultural development, which includes activities on phytosanitary practices and environmental impacts.[23] PROEXANT serves clients who produce or export NTAEs, and it collaborates with such government institutions as the Ministry of Commerce and Industry, Ministry of Agriculture, and with banks, trade associations, and relevant foreign agencies (such as the United States Food and Drug Administration) to develop policies and services for export promotion.

Besides USAID's promotion program, other development agencies that support NTAEs include the Commonwealth Development Corporation, which dedicated $4 million to NTE promotion; the German government, which is providing some technical assistance in production; and the Canadian government, which is assisting on NTAE transport.[24] The World Bank and the Interamerican Development Bank (IDB) also support this agroexport strategy.[25] For example, in late 1993, the IDB approved a $1-million loan for NTAE promotion in Ecuador, which is intended to strengthen the National Coordinating Committee for the Promotion of Exports and Investments, support flower and wood industries, and to help develop export and import policies and sectors.[26]

Ecuador's government has rescinded some of its protectionist policies and now supports export-led growth and trade liberalization. It has *not* established major subsidies for exporters, but rather it has slowly reduced national export barriers through macroeconomic reforms and has decreased subsidies for national food production.[27] Some goverment agencies have established specific export-promotion activities. For example, Ecuador's Corporación Financiera Nacional (CFN), the state lending agency, provides credit for NTAE producers, gives technical assistance to creditors, and carries out marketing research and feasibility studies on selected NTAE crops. All loans are made on a competitive basis, and credit policies favor affluent export investors, as opposed to smaller NTAE farmers who represent higher risks. CFN also helps formulate export laws, keeps records on export values and volumes, and finances some NTAE companies. The Ministry of Industry and Commerce also has a NTAE-promotion program: it offers training and short courses on product quality and market standards, disseminates market information, conducts studies of promising NTAE crops, participates in international trade fairs, and analyzes bottlenecks. Trade associations also strongly support NTAEs. For example, the Federation of Exporters (FEDEXPOR) supports all kinds of export businesses, while EXPOFLORES, a guild, defends the interests of flower businesses.

B. Growth trends in NTAEs

In Ecuador, as in many Latin American countries, NTAE production has burgeoned in recent years. *(See Tables 1 and 2 and refer to Appendix for trend data in Latin America.)* The overall value (FOB) increased 3.5 times (350 percent) while volume more than doubled. Flowers and processed products enjoyed particularly high export growth, as shown in Table 2. *Quinoa*, a traditional rural food with high protein content, is a unique product of the Andean region and was exported for health-food markets. Among the fresh fruits, honeydew melons are important. Among vegetables, broccoli ranks first: the value of exports grew from zero in 1989 to $32,400 in 1990 and to $552,200 in the first 10 months of 1991.[28] Ecuador exports to eight countries, which are, in order of importance, the United States, Germany, France, Great Britain, Chile, Belgium, Venezuela, and Colombia. The United States is by far the largest market. Most products are transported by air, to assure freshness upon arrival, but some products such as frozen foods are shipped.

Table 1: Export of Agroindustrial and Nontraditional Products – Ecuador, 1985–1991

Year	Volume (1000 MT)	Value ('000 US$)
1985	7,700.60	$8,009.10
1986	9,566.50	9,937.60
1987	12,927.30	13,233.70
1988	16,746.80	15,074.00
1989	24,169.90	21,643.00
1990	26,169.90	28,608.80
1991 (1)	26,829.60	35,981.80

(1) January – October

Source: Banco Central/Fedexpor, Quito (1992, unpublished data)

Table 2: Export of Nontraditional Products - Ecuador 1985–1991 (in thousands of US dollars)

Product	1985	1989	1991 [1]
Processed cereals	9	26	85
Fresh vegetables [2]	7	53	796
Processed vegetables	77	626	1862
Fresh fruit	1341	1973	1232
Banana products	1089	5174	6155
Fruit jellies	69	263	700
Fruit juices	1006	1418	2393
Spices	127	70	68
Various processed foods	3730	1658	5812
Plants	20	4	187
Flowers	526	9225	16584

1) January–October

2) Includes refrigerated, frozen, and jellied

Source: Banco Central-Fedexpor (1992; unpub. data)

III. KEY CHARACTERISTICS OF NONTRADITIONAL AGRICULTURAL PRODUCTION

A. General features of NTAEs [29]

Although the crops and production methods on NTAEs are diverse, several characteristics typify NTAE production:

- Requirement to fulfill strict marketing demands of Northern importers, including:
  - high quality (e.g., esthetic "perfection" standards) ;
  - specified times and volumes;
  - stringent phytosanitary and sanitary standards;
  - tolerance limits for chemical residues in products;
  - complex export procedures, such as customs processes, financial permits, legal contracts, and inspections;
- High perishability (short shelf-life) of fresh products, requiring special production technologies, packaging, and transport systems;
- Large capital investment, to cover high input costs;
- Dependence on high inputs of imported technology, especially heavy use of pesticides, and complex information for managing the technology;
- Centralized decision-making by managers and exporters over labor, and dependency on cheap labor by unskilled workers, many of whom are temporary;
- Need for well-developed marketing channels, transportation, and infrastructure, for inputs and for sales; and strong involvement of and links to foreign investors;
- Monocultures with standardized crops and production methods;
- Stress on maximization of short-term returns; and
- Stiff competition with other NTAE businesses in Ecuador and from other countries.

As discussed later, these basic characteristics shape the practices, results, benefits, and costs of NTAE production, and some pose constraints for farmers. Some of the particularly influential factors are demands to fulfill many complex requirements far outside producers' control, high inputs of chemicals and information, and stiff competition in the industry. Esthetic specifications for fruits and vegetables, which include detailed standards for "acceptable" size, shape, and ripeness, color, and percentage content of juice and sugar, are set and monitored by institutions in importing countries, such as the Agricultural Marketing Service of the U.S. Department of Agriculture (USDA.) Besides meeting these requirements, another hurdle for farmers is taking advantage of certain import windows, when products are permitted and prices are high. For example, honeydew melon producers can sell their fruit profitably to buyers in the United States only during peak demand from mid-November through mid-January. They cannot compete at other times because the United States places a higher tax on melons and protects U.S. growers.

These features of NTAEs contrast sharply with those of crops for local markets or for subsistence. Producers of local crops invest comparatively little capital and use chemicals sparingly (mainly due to economic and agroecological differences), rarely plant monocultures (usually preferring diversity), and do not have to meet strict foreign demands. On the other hand, many features of nontraditional production are similar to those of such *traditional* agroexport crops as bananas and coffee. For example, the chemical intensity, technical sophistication, competition, labor relations and dependency on foreign demands, are comparable. (In some cases, NTAE farmers apply even more chemicals per hectare than those who produce traditional export crops do, mainly because of perishability and quality requirements.) Unlike traditional agroexports, NTAEs do not require enormous tracts of land; small plots are sufficient for establishing a profitable business in some high-value NTAE crops. But large capital investments are necessary. For example, the average initial investment for export flower plantations is *$200,000 per hectare. (See Box 3.)* In this sense, NTAEs mirror the patterns of previous export booms, though the products themselves are distinct.

B. Production areas and product types

NTAEs in Ecuador have been developed in two main regions—the highland (Sierra) region surrounding Quito and the coastal provinces near Guayaquil, mainly because these areas are close to international airports and maritime ports and also have good climates for growing particular NTAEs. For example, flower yields are higher in relatively high altitudes near Quito, where sunlight and temperatures are optimal for flower production.

Proponents and producers of NTAEs have focused on the crops that grow best and have the highest financial potential. PROEXANT, banks, and other agencies concentrate

BOX 3: Costs of Export Flower Production

The initial installation and preparation of greenhouses and fields for flowers involves many months and a remarkably large capital investment, estimated at an average of $200,000 per hectare. Annual input costs are also high, especially for agrochemicals. A feasibility study carried out in 1989 by a rose entrepreneur reports that 9 fertilizers, 6 fungicides, and 4 insecticides would be applied on a regular basis to roses in a total of 1.42 hectares. Table 3, a summary of the data contained in the feasibility study, represents typical costs on a rose plantation. In the first full year of production, this firm planned on spending $18,913 on agrochemicals in the following proportions: fertilizers (69.9 percent), fungicides (9.3 percent), and insecticides (20.9 percent). Costs per hectare per year, according to this source are $9,306 for fertilizers, $1233 for fungicides, and $2780 for insecticides.

Table 3: Sales and Costs of Production, in an Exemplary Ecuadorian Flower Plantation 1989–1992 — (in dollars)[1]

Year	Income (sales)	Costs, production [2]	Costs, operations [3]	Labor, taxes [4]	TOTAL
1989	0	26,597	25,278	0	(37,350)
1990	172,800	53,194	50,555	25,030	69,050
1991	201,600	53,194	50,555	25,539	97,850
1992	201,600	53,194	47,212	36,682	101,193

1) Converted from sucres, exchange rate, 1990: 720 sucres/$US. (Figures are rounded.) Based on proposed production budget.

2) Includes direct and indirect labor costs, inputs, office supplies, maintenance and repair, fuel, insurance, electricity, uniforms, transport, petty cash, and depreciation.

3) Includes mail, telex, phone, maintenance on vehicles, insurance, taxes, audits, rental costs,.

4) This category refers to 15% of utilities paid to workers, and income tax.

Source: Original data from flower producer, 1989 (W.Waters)

their marketing and technical support and credit services on these key crops too. Flowers and several high-value vegetables and fruits are priorities, and such native crops as quinoa, nuts, and tropical ornamental plants have also attracted some interest. Decisions about priority crops are made mainly by market analysts in development agencies (such as USAID), PROEXANT, and other business analysts and investors from trade associations. The choices are based on market studies of demand, competitive potential and market windows, and to some extent, on climatic conditions. Some of the priority crops promoted by NTAE proponents, such as broccoli, asparagus, squash, and berries, had never been grown or eaten before in Ecuador until recently; transferred from temperate countries, they require foreign seeds and unfamiliar technologies. For some crops, such as flowers, inherent soil characteristics are not seen as major concerns because the producers use very high inputs of chemical fertilizers, soil additives, and pesticides to create "artificial" conditions for maximizing yields.

Processed NTAEs, especially frozen and canned fruits and vegetables, have some advantages over fresh products. They are less perishable, they can be stored longer, and they enjoy more stable year-round demand, so they have wider markets.

After processing and packaging, they usually have added value over fresh products, and the local processing industries generate rural jobs, meeting an important socioeconomic need. However, production and transportation require relatively sophisticated and expensive technological capacities.

As of 1992, the estimated area devoted to NTAEs totalled 16,703 hectares,[30] currently a small percentage of the total area under agricultural production in Ecuador. This area will probably expand, and NTAEs have a very high value per unit of land. Remarkably little data is available on the size of plots and land tenure of the NTAE producers, except in flower production. *(See Box 4.)* But according to experts, most NTAE farms range from 10 to 100 hectares, and few exceed 100 hectares. For flower production, average farm size totals only 6.88 hectares.[31] Even so, most NTAE producers are well-endowed businesses in terms of their capital and income, not typical "small-scale" farmers.

C. Economic and trade policies and regulations affecting NTAEs[32]

As noted, macroeconomic policies, trade liberalization and political conditions mandated by development agencies influence the development of agroexport production. Ecuador's government has been slow to implement policy support for NTAEs, partly because some decision-makers and analysts oppose these changes and instead have interests in protecting local producers and meeting local food needs first. Until the 1990s, Ecuador still had regulations that constrained exporters. Indeed, until mid-1992, exporters were required to follow numerous bureaucratic procedures to export any products. They had to fill out 40 original forms and submit multiple copies, obtain 254 signatures, acquire legal permits from several agencies (such as the Central Bank, Ministries of Agriculture and Commerce, and the Customs Agency), and make multiple financial arrangements, undergo many inspections, and comply with certification processes—all of which on average took 138 hours per shipment, according to a study by PROEXANT.[33] Most exporters had to hire specialists to handle the requirements, and this bureaucratic quagmire discouraged potential new NTAE businesses and contributed to a decline in the number of export companies from 160 in 1988 to 50 by 1992. In reaction, export promotors and entrepreneurs, including PROEXANT, USAID, FEDEXPOR, the Ministry of Commerce, and trade associations pressured government representatives to eliminate these complex paperwork requirements. After over two years of long debates by the Legislative Assembly and the President's office, a significant reform known as the Export Facilitation Law was passed in early 1991. This law reduced and simplified the requirements for exporters, creating a "single window" (*ventanilla unica*), through which the Central Bank now oversees the permits, processes, and requirements.

BOX 4: Features of Flower Production [34]

From 1985 to October 1991, flower production in Ecuador grew by **1,522** percent (15-fold) in terms of volume and **3,055 percent** in value, and between 1990 and 1992 alone, the number of producers doubled, reaching about 70. This remarkable boom stems from several factors, especially the high value of the end product, technical development, an increase in the varieties of flowers demanded and exported, access to foreign capital, and such baseline conditions as an excellent climate for flowers and the availability of inexpensive labor.

45 percent of surveyed firms received some foreign investment, and 75 percent work with foreign brokers. While most plantations were founded by Ecuadorian investors, foreign investors—in many cases, Colombian flower producers looking for secure investment alternatives—have entered the sector. Two out of three investors are businessmen from urban areas. Virtually all firms export 90 percent or more of their production, mostly to the United States, but also to Western Europe, Canada, and Japan.

Most flower production in Ecuador is carried out in the highland region, near Quito and the airport. The plantations have sophisticated infrastructure. The flowers are grown in plastic-covered greenhouses, which are usually protected by wind-breaks made of locally-available bamboo. Flower beds are prepared, levelled, and planted with imported seedlings. The farms have complex irrigation and drainage systems and electric lights for night lighting. Post-harvest handling, sorting, packaging, and loading takes place in buildings with sophisticated cooling systems. Many flower businesses also have management offices, cafeterias for workers, maintenance facilities, and vehicles. Flower production is systematically planned, timed, and executed to meet specific market demands and high-quality standards. Demand peaks during special holidays in North America—particularly Valentine's Day and Mothers' Day.

Chemical fertilizers and pesticides are applied heavily and frequently, on a calendar basis by laborers. Unlike food products, flowers are *not* inspected for residue-tolerance levels by importers, so producers have relatively little concern about residues. The environment within the greenhouses is artificial and chemically "sanitized." The aim is to fully control all variables. Since sophisticated scientific knowledge and inspections are thus required, many producers hire specialists in floriculture from Holland, Colombia, and other foreign countries to manage their farms. If the quality or timing is not right, they incur great financial losses.

Table 4 provides data on 47 flower plantations surveyed in 1990.[35] The total area of export flower production totals less than 400 hectares. The average enterprise is only about seven hectares, even though the the investment per hectare is large. Flower production is very labor intensive *(see Table 4)*: only 13 of the 47 firms surveyed employ fewer than 50 workers, and the worker to area ratio is 15.4 per hectare. Of 5,058 workers surveyed, 3,149 (62 percent) are women. Because most plantations are concentrated in a comparatively small area, labor can be relatively scarce so growers must offer wages that may exceed the legal minimum and provide other benefits, which may include medical services, lunch, and transportation.

Table 4: Features of Ecuadorian Flower Plantations, 1991 Land and Labor

	Mean	(SD)*	Min.	Max.
Size (hectares)	6.88	(5.87)	1	30
Number Workers	107.62	(112.18)	17	596
Number Female Workers	67.00	(70.90)	11	400
Number Male Workers	40.43	(55.38)	0	301
Women Supervisors	3.74	(4.32)	0	20
Women Part-time	1.72	(8.33)	0	55
Men Part-time	1.30	(4.58)	0	26
Age of Operation	3.73	(2.18)	1	9

* standard deviation

Source: W. Waters, 1992. "Restructuring of Ecuadorian Agriculture and the Development of Nontraditional Exports: Evidence from the Cut Flower Industry." Unpublished paper. Quito: Universidad San Francisco de Quito.

Although this policy change has cut some red tape, exporters still face additional commerce regulations and barriers once the product reaches the importing country. For example, an exporter aiming for the United States must pass through customs permits, pay taxes, and pass phytosanitary, sanitary and quality inspections by the Food and Drug Administration (FDA) and the Department of Agriculture, and aesthetic standards set by food marketing industries. *(See Figure 1.)* (The FDA randomly checks for pesticide residues, for instance.)

Beyond the trade laws, the rate of exchange is another macroeconomic influence on NTAEs' profitability. During the 1980s, the prevailing exchange rate was disadvantageous for exporters because the local currency (sucre) had been overvalued vis-a-vis the dollar, creating financial stress for many NTAE producers. In 1991, the exchange rate improved somewhat for exporters, but financial instabilities may undermine it again. Other economic policies also affect NTAE producers in the 1990s. Getting credit is increasingly difficult, imported inputs are subject to a 10-percent tax, and fluctuations of market prices and trade barriers in importing countries—outside of producerss control—have eroded NTAE profits.

In the development of agroexport policies, most decisionmakers and investors have focused on maximizing growth and foreign exchange earnings, responding to immediate pressures from international finance agencies, while giving relatively little consideration of sustainability and equity of NTAEs. The implications of this orientation are discussed below.

Figure 1: Production Challenges for an Exporter of Nontraditional Agroexport Crops

Main Types of Challenges in Latin America:

- Developing Market Opportunities (Market Research Links with Buyers)
- Credit and Finances
- Production Challenges (e.g. Pests, Climate, Pesticide Use, Soils)
- Packing and Transport (Post Harvest Management)
- Export Laws/Processes (e.g. taxes, permits, customs)
- Fulfill Market Demand, Quality, and Timing, Residue Standards

Import Requirements and Regulators (in the U.S.)*

An Exported Product must pass through:

- **U.S. Customs Service** — Collects taxes on imports and statistics on trade/commerce; prevents contraband
- **APHIS—Animal Plant Health Inspection Service** — Regulates fresh products, plants and plant products, animals and animal products
- **Food Safety Inspection Service (in USDA)** — Regulates meat and poultry; certifies packing facilities
- **Agricultural Marketing Service (in USDA)** — Applies "market orders", regulates grading standards and aesthetic standards
- **Food and Drug Administration (FDA)** — Applies EPA laws on pesticide tolerances, regulates fresh and processed products for containments

This information is adapted from a figure by Robert Bailey, LACtech, Chemonics

IV. REPERCUSSIONS OF NTAE PRODUCTION: BENEFITS, COSTS, AND RISKS

The growth of NTAEs in Ecuador has generated not only benefits, but also economic, social, and ecological costs that need to be considered.

A. Economic and social benefits

1. Economic returns, investments, and diversification

The growth rate of NTAEs has been impressive. As Tables 2 and 3 show, this sector has generated substantial foreign exchange, reaching nearly $36 million in 1991. In addition, the types of products exported and the number of NTAE producers have both increased significantly. As of December 1991, some 124 kinds of nontraditional agricultural products were exported. The total number of producers has not been calculated, but PROEXANT serves about 400 clients, who represent less than half of the total. Another spin-off of NTAE production is the formation of production guilds or trade associations for NTAEs, which serve the interests of the producers and exporters. Ecuador still has fewer than twenty agroprocessing companies involved in freezing, canning, or drying nontraditional export crops, but the potential for growth is great.

Both foreign and national investment in NTAEs have increased. Direct support comes from the Commonwealth Development Corporation and the International Finance Corporation. *(See Table 5.)* The main investors in Ecuador's NTAEs are affluent entrepreneurs (both producers and distributors) who have close ties to foreign capital.

2. Employment benefits and opportunities for women

NTAE growth also generates jobs. Many NTAE crops are labor-intensive compared to other crops. For example, flower production uses an average 204 person days per hectare per year (as compared to 150 person days for potato production, 31 for bananas and 44 per hectare per year for coffee).[36] Nobody has comprehensively surveyed labor statistics in this sector. One evaluation by PROEXANT shows a total of about 28,427 jobs in NTAE production as of 1992. *(See Table 6.)* But some producers consider this estimate low. The jobs in NTAEs enable many workers to acquire new skills, especially in processing. Some of the workers have their own small plot of land and work in NTAE plantations for supplementary income.

A significant proportion of NTAE workers are women. As indicated on the table, in 1991 an estimated 8,646 of all workers (or 69.3 percent) in Ecuador's NTAE production were female. Preliminary appraisals in NTAEs show that

Table 5: Investment Generated - Nontraditional Agroexports

Institution	Beneficiary	Sector	Investment (Million $US)
Private Sector	Various	Maquila	15
CDC	Exporter	Fresh Flowers	8
CDC	Exporter	Fresh Fruit	2
IFC	Exporter	Wood	10
IFC	Foundation	Forestry	1
Total			**$36 million**

Source: Trimestral Reports/PROEXANT, 1992

Table 6: Field Workers, Production and Export

(US $) *Field Workers*

Products	Area (hectares)	Men	Women	Total	Export Value ($)
Artichokes	17	16	4	20	--
Cucumbers	4	2	3	5	--
Blackberries	20	14	14	28	--
Maracuya	2,662	639	2,555	3,194	4,399,900
Melon	550	250	50	300	1,020,600
Strawberries	80	16	94	110	563,600
Mango	1,100	440	110	550	75,900
Asparagus	700	60	140	200	229,200
Cut Flowers	350	1,100	4,400	5,500	19,248,600
Broccoli	200	32	126	158	688,300
Pineapple	400	320	80	400	1,516,000
Tomatoes	1,100	500	160	660	171,800
Palm Oil	300	144	36	180	1,526,500
Beans	1,800	216	864	1,080	720,000
Lemons	200	90	10	100	100,000
TOTAL	**9,483**	**3,839**	**8,646**	**12,485**	**30,260,400**

Source: PROEXANT, 1992

most of the women employed in NTAEs are young (i.e., early 20s), single, and childless. Managers seek these characteristics among female job applicants, partly to avoid paying child-care and pregnancy leaves.[37] Wages are low in many areas of NTAE production. But where the labor market is tight, NTAE managers have raised wages to attract women workers, and tend to pay higher than those in charge of traditional plantations.[38]

Although women have traditionally produced food throughout Ecuador, export plantations and processing give women new opportunities in *wage-based* agriculture. Managers interviewed prefer women laborers for this kind of work. They say that women are better suited to and skilled at pruning, harvesting, sorting, selecting, and packaging, that require considerable dexterity. Also, studies by certain firms have shown that women are more efficient and productive than men in this line of work. For example, a study of a rose plantation showed that the average female worker cut 4.5 flowers per minute, compared to 1.8 flowers per minute for males. In addition, some managers realize that women are often willing to work for lower wages than men. Managers interviewed in a comprehensive study of work conditions further mention that women are "more submissive, obedient, capable, and honest" workers than men in such jobs.[39]

To better understand the impacts of these jobs, it is helpful to consider how women spend NTAE wages: In preliminary appraisals of expenditures in Ecuador, women workers interviewed said they spent their wages on food and household needs and occasionally clothing, and on children's health, education, and clothes. These same women reported that their earning power increased their self-confidence, respect from their families, and their decision-making influence in the household.

In sum, NTAEs have generated job opportunities, particularly for women, and the growth of processing plants could further increase employment. However, more research is needed to assess the impacts of employment on workers' well-being.

B. Socio-economic costs and inequities

The NTAE development strategy also entails risks and costs that require attention. Some of these social costs are hard to quantify, but it is nevertheless important to ask who benefits from NTAEs and whether NTAEs contribute to broad-based and sustainable socio-economic development for the majority of Ecuador's people.

The most significant social concern of the NTAE strategy is *inequitable distribution of benefits* from NTAE growth. Since nontraditional export and production in Ecuador is carried out largely by entrepreneurs with substantial capital, resources, and connections to foreign markets, the main beneficiaries are often industrialists, bankers, and other businesspeople, using NTAE investments to diversify their portfolios. Although the NTAE farm sizes are rarely large, very high investments are required. Poor farmers in Ecuador with small holdings have great difficulties competing in the NTAE market, with its numerous entrance requirements, including high investment, sophisticated technology and information, complex transport and marketing linkages. Constrained by lack of access to credit, technology, and information, they are usually unfamiliar with the crops prioritized by PROEXANT. Few of them have access to PROEXANT services for NTAEs because they cannot pay the fees to get these services. (A producer must pay at least $100 for the initial membership fee to FEDEXPOR and $25 per month.)

An exception is the involvement of small-holders in Ecuador's NTAEs is in quinoa production, through contract farming. In the highlands, a dozen small farmers produce quinoa and sell it to a large and successful producer/exporter called INAGROFA. This company rents land to small producers and also buys quinoa from larger producers and has its own quinoa plantations. But most small farmers lack such opportunities in Ecuador. Most NTAE entrepreneurs, banks, and PROEXANT directors consider contract farming too risky, they do not encourage small-farmer involvement. Few cooperatives of small farmers have been organized for NTAE production in Ecuador, though they have in Bolivia and Guatemala[40] (where farmer organizations and cooperatives have different capacities.) If Ecuador's NTAE growth con-

tinues along current lines, poor producers will remain outsiders in this business. This situation raises doubts about the social sustainability of NTAEs.

Although NTAEs have produced new jobs, several labor-related problems are also evident. Many jobs in this sector are insecure, sporadic, and unpredictable—like most temporary and seasonal work. A significant proportion of the laborers lack legal contracts and employment benefits. Moreover, fluctuations in market demand mean that, at times, very few workers are required, especially in fruit and vegetable processing. During most of the year, processing plants operate far below capacity, because the supply of raw produce is low, so much of the labor force is idle. But when market demand is high—for instance, during holiday seasons for flower production—workers must work nights, weekends, and double-shifts, sometimes in violation of labor laws. Furthermore, workers in Ecuador are rarely unionized and are discouraged from organizing; so it is difficult for them to work together to negotiate changes.

Labor conditions in NTAEs create particular problems for women workers.[41] *(See Box 5.)* Recent studies of plantations and processing plants show that women sometimes receive lower wages than men for similar work and that they work longer hours, receiving no extra pay for overtime hours. The large majority of these women laborers are burdened with "double-day" demands; that is, after a full day's work out of the home, they must complete household chores at home, with little help from men.[42] When women work double-shifts during peak seasons, some children must be left at home alone; and few companies provide child care. In NTAE processing factories, many women have suffered from health disorders in their abdominal organs, provoked by standing long hours on hard floors.[43] Violations of Ecuador's minimum wage law have been reported in some NTAE plantations, especially vis-a-vis women.[44]

NTAEs are not the only export crops plagued by these labor-related concerns, but the instability and insecurity of the NTAE market can exacerbate the problems. Such patterns, along with health risks from chemicals discussed below, raise questions that require immediate attention.

C. Environmental impacts and their socioeconomic repercussions

NTAE production depends upon and affects natural resources, including soils, water, and plants. The *specific* environmental impacts of NTAEs vary with crops, agricultural technologies, and agroecological conditions. However, several general types of adverse impacts impair productivity,

BOX 5: Women Workers in NTAEs: Labor Conditions and Impacts[45]

A comprehensive survey of 120 women workers in NTAE businesses (80 in plantations and 40 in processing plants) undertaken by CEPLAES (Centro de Planificación y Estudios Sociales) in late 1993 reveals useful information about women working in this context, their labor conditions, and the impacts of this work. The majority of the women are very young; in processing plants, 73 percent are younger than 24 years and in the plantations 60 percent are younger than 29 years. About half interviewed (48 percent in plantations and 55 percent in processing plants) are single. About half of the women did not have any other wage-earning job before starting this NTAE work. Most of them are using their earnings to supplement family income; the majority belong to families that have small subsistence farms (i.e., mostly under one hectare).

Some 70 percent of the women in plantations earn monthly wages between about $33 (i.e., 66,100 sucres, the minimum wage) and $67. In processing plants, monthly earnings for the majority are between $68 and $101. But managers rarely pay fixed salaries; they vary the payment arrangements, sometimes paying on a daily or weekly basis and at other times on a basis of the job completed (e.g., per bag of vegetables picked). In addition, 80 percent of the women in NTAE plantations and *all* of the women interviewed in processing plants work extra over-time hours in their companies. The frequency of overtime working is high; and 15 percent of them work overtime two or three times per week. Overtime work is particularly frequent among single women. Yet, few are paid extra wage for this overtime work (as legally required).

These women lack basic labor rights and benefits. Of the 80 interviewed in plantations, 56 percent receive none of the benefits specified in the labor law (such as social security and health benefits), and of the 40 women in the processing plants, 20 percent do not have any kind of benefits. The law also requires maternity leave *with pay* for three months before or after childbirth, and also requires that women workers be given time off for nursing babies (15 minutes for each hour of work) for a year after birth. However, none of the women interviewed is given this time off with pay. Furthermore, the women consistently lack knowledge about their labor rights and benefits. A surprisingly high percentage of women—80 percent in plantations and 60 percent in processing plants—do not have any labor contract. Three months is the common duration of contracts for the few workers who have them. In most cases, the labor relationship is established through an informal oral contract.

Worker organizations or unions do not exist in the many NTAE companies included in this survey. The NTAE owners emphasize that the workers must not become involved in worker organization or try to form one. Anybody caught trying to do this is fired. The majority of the women interviewed (58 percent in plantations and 60 percent in processing plants) think that they have no possibility of advancing within their companies. Women's positions are low in the hierarchy. The majority say that promotions are not possible; higher positions are reserved for men only.

The women generally spend their earnings on food, health, and educational purposes. The single women have slightly more varied expenses, such as clothing or savings; but they also generally contribute their earnings to basic family needs. Most also maintain control of their own income. The large majority of the women in this survey undertake demanding domestic tasks and child care, and expressed concern about the physical and psychological pressure this places on their lives.

In spite of problems in the labor conditions, about 60 percent say that they do not want to stop working in wage-earning jobs. However, the large majority (about 85 percent) said that they would like to change the particular kind of work that they do, if it were possible. They expressed preference for artisanry, sewing, or sales; and many young single women said they would prefer to study to get into better positions.

health, and ecosystem functions. Some jeopardize producers' profits, while others are "external" costs to society.

1. Pesticide Use and Repercussions

A survey of 54 growers and 104 workers in 1991 revealed that for most NTAE crops, producers use high volumes of pesticides. Many kinds of pesticides, including nematicides (for controlling nematodes), insecticides (for aphids and other insects), and fungicides (for diseases) are applied on a regular basis. The producers surveyed consider intensive chemical use essential for meeting the phytosanitary standards, quality requirements, and yield goals for foreign markets. Consumers' demands for "blemish-free" produce is a particularly strong inducement to use chemicals heavily. Another influence is the greater susceptibility of monocultures in NTAE plantations to pests and diseases.[46] Pesticide inputs are especially high on such perishable crops as flowers, pineapples, mangoes, and strawberries, which are subject to stringent quality controls. The production of crops for canning or processing, such as "industrial-grade" tomatoes for making tomato paste, usually requires less pesticides, since these foods need not look "perfect." The survey confirmed that 63 percent of the growers spray chemicals prophylactically —before pest outbreaks occur. In contrast, only 22 percent spray once the pest appears. Growers also apply with high frequency: 29 percent of the total apply pesticides 16 to 20 days per month; and the rest apply between 5 and 15 days per month. Producers are generally aware of standards concerning permitted products and residue tolerances in the exported products, but they do not have capacity to monitor residue levels. This happens when the produce enters the markets of the importing nations.

In Ecuador, NTAEs produced organically or under Integrated Pest Management (IPM) methods (that is, the use of a combination of pest-control methods and minimal use of chemicals) have been tried only experimentally and on a very limited commercial basis so far. None of the producers surveyed use economic threshold assessments, which are central to the IPM approach, to determine how much pesticides to apply. Although organic NTAEs are increasingly grown successfully in Central America, Ecuador's producers are not investing in such alternatives, partly because they lack information and experience.

Farm managers interviewed generally rely on instructions from pesticide salespeople or product labels, and training for pesticide use has been minimal. Among the technicians interviewed, 28 percent received no training, 18 percent learned from pesticide salespeople, 29 percent learned from the distributors or buyers, 11 percent learned from private institutions, and 16 percent from state institutions, they reported. Most know about the phytosanitary requirements for their crops and use chemicals in the hope of keeping products pest- and blemish-free. However, the survey and observations reveal that workers rarely take adequate measures to insure their own safety and protection of the environment and rarely receive instructions on the risks of and safety measures for chemical use. Nor do most technicians and supervisors provide safety equipment to workers.[47] Thus, though pesticides can help to curb losses in the short run, they also have multiple costs, especially if they are used improperly:

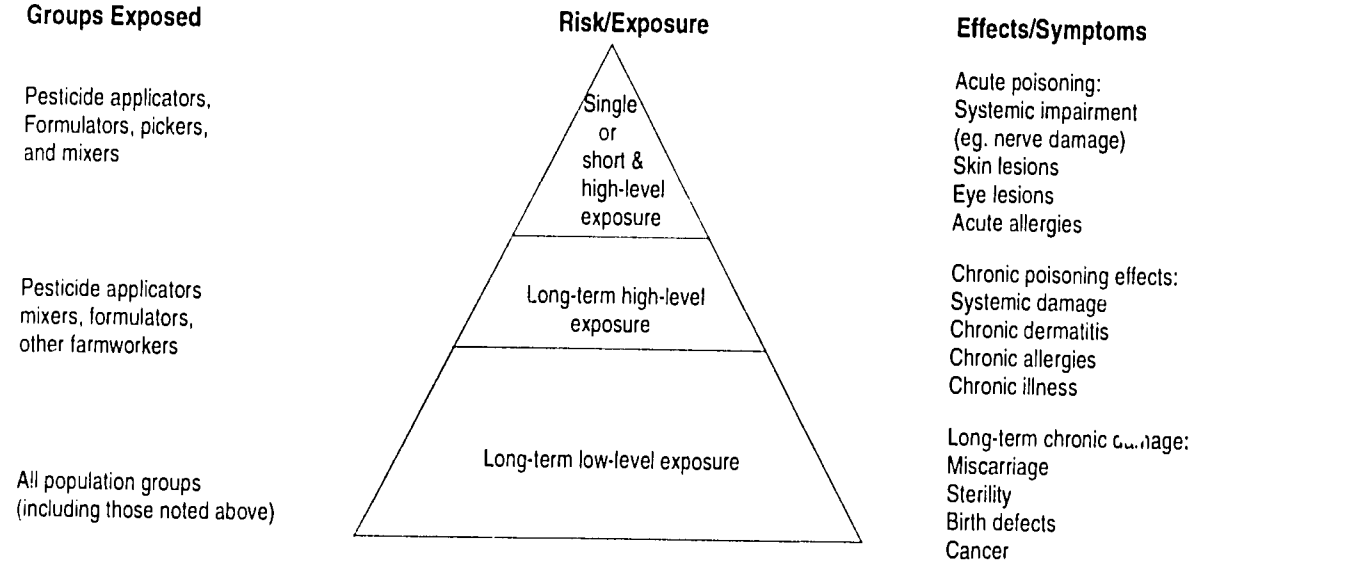
a) Direct costs: Pesticides are expensive, representing a significant proportion of the total costs of inputs. For example, one average flower producer interviewed spent an estimated $30,000 per year per hectare on chemical inputs, which was over half of the total production costs.[48] In another estimation of flower production, $18,913 (about 35 percent of operational costs) was spent in one year on agrochemicals, and of this, 30 percent was for fungicides and insecticides.[49] All of the chemicals are imported and taxed. Also, inadequate adjustment and maintenance of spray equipment commonly results in wastage, which raises costs.

b) Residues: When pesticides are applied excessively or too close to the harvest time, the residues accumulate in foods in levels that exceed the tolerance standards established by the governments of importing countries. Since residues pose health hazards to consumers, the entire shipment of the product is rejected when violations are detected, resulting in serious financial losses to the producers. Few Ecuadorian exports have been rejected for this reason. Thoughnone of the interviewees had experienced this problem, U.S. Food and Drug Administration records showed that Ecuadorian products were rejected for containing excessive pesticides 10 times in the U.S. ports between 1985 and 1992. In 1992, strawberries containing chloratolonil above tolerated levels were rejected, and in 1990, string beans with excessive amounts of methamidaphos and pirimiphos were found.[50] Additional violations have occurred in European ports as well.

Ecuador's residue problem in NTAE products is far less serious than that of Guatemala, Costa Rica, Chile, and a few other countries, which have experienced hundreds of violations and rejections of snow peas and other NTAE crops shipped to the United States, worth millions of dollars. (For example, 510 shipments of Guatemalan NTAEs—mostly snow peas—were found in violation of pesticide standards in 1992, mainly due to clorathonil residues, and there were 119 violations in 1990.[51]) Yet, this residue problem poses a significant *risk* to Ecuadorian exporters and it will probably grow more serious as NTAEs expand under present patterns. Most producers interviewed voiced concern about this risk, especially farmers with small or medium-sized operations who find it harder to respond to risks than to farmers with better access to information, capital, and technical assistance.[52]

Pesticide residues may also pollute the environment, particularly water sources, soils, and vegetation. This contamination can raise costs for producers or engender social costs, though most are never calculated. Several of the analysts and producers interviewed stated that pesticide pollution of water is a problem in NTAE production, but the extent of the contamination has not been measured in

Figure 2: Categories of Health Impairment from Pesticides and Population Groups at Risk



Source: Adapted from Davies et al, 1983, and WHO, 1990

Ecuador, where technological capacity for residue monitoring is limited.

c) Resistance: Another negative impact from the continual use of pesticides is pest resistance. Through genetic selection, pests evolve to tolerate the toxic impacts of pesticides over time. As pesticides become ineffective, high economic losses ensue. Farmers then become trapped into increasing pesticide inputs in the attempt to regain control. The process is accelerated if pesticides are used excessively, or if one product is used season after season. Resistance is sometimes accompanied by the death of natural pest enemies, leading to outbreaks of secondary pests. The resulting "pesticide treadmill" has affected many agroexport crops in Latin America.[53] In the survey of NTAE growers in Ecuador, very few reported battling pest resistance so far. But few possess the knowledge needed to detect the problem and resistance takes several growing seasons to build up, so this problem is likely to become increasingly serious as long as chemical-intensive methods remain prevalent.

d) Health Hazards: Harm and hazard to workers' health are prevalent and growing impacts from pesticide use. Increasing numbers of people are being exposed and impaired, and increasing numbers are suffering both acute poisonings and chronic damages. *(See Figure 2.)* Most of the victims are agricultural workers in NTAEs—the poorest of those involved in NTAE production. Usually provoked by direct exposure to toxins, acute poisonings can bring on vomiting, fever, vertigo, diarrhea, delirium, muscular convulsions, neural damage, or even death. The number of acute pesticide poisonings in Ecuador's NTAE sector is not known, but descriptions from farmworkers in the survey and other studies provide evidence of occasional poisonings. Chronic effects include headaches, allergies, dizziness, dermatitis, blurred vision, or carcinogenetic disorders that emerge over years. In the survey of workers, 62 percent said that they had suffered health disorders from exposure to pesticides while working. Of these, almost 25 percent had experienced more than three symptoms, and 36.5 percent experienced two to three symptoms, while the remaining 10.5 percent had single symptoms, often headaches.

These problems are particularly serious in flower production because highly toxic nematicides such as Temik (aldicarb) and Nemacur (fenamifos) are widely used, because the closed hot greenhouses intensify the risks to chemicals, and because most managers have relatively little concern about residues. Although Temik was banned in Ecuador in late 1991, it was still used in flowers as late as 1993 because growers value this product's effectiveness over worker safety. Even workers who do not spray the chemicals can be harmed by working in the chemically-saturated environment. Flower production managers sometimes withdraw field workers after spraying, but only for 30 minutes—an inadequate waiting period. Many workers not only report symptoms of low-level pesticide toxicity, but also show clinical signs monitored through blood tests.[54] In a study cited by Blumberg, blood tests of about half of the workers in one large flower firm showed declines in the cholinesterase levels of 27 people, to 30 percent below normal, indicating risks of short-term health damage and potentially long-term kidney or liver damage, according to physicians.[55] Of these 27 people, 23 were women. According to studies by Fundación Natura, blood analyses of workers in

flower plantations also indicate that workers face significant health risks from pesticides.[56]

These health impacts not only cause suffering; they also lower the workers' productivity. Many of the victims need intensive medical treatment that they cannot get or afford. Women are particularly vulnerable to both acute poisonings and long-term damage from toxic pesticides because women's reproductive systems and other organs are intrinsically more sensitive than men's.[57] Such health problems are likely to increase if production methods are not changed.

*e) **Sum of pesticide impacts:*** Together, these actual and potential problems from intensive pesticide use create costs that are often ignored. Were these costs fully accounted for, the economic returns from the chemicals would look less favorable. Economic losses from pesticide-contaminated foods are particularly threatening and show how excessive pesticide use is self-defeating. Given these problems, *91 percent* of supervisors interviewed expressed interest in reducing pesticide inputs.

The proximate causes of the pesticide-related risks and problems often cited are unsafe or excessive use of products, users' lack of knowledge and training on the dangers and application measures, and the absence of appropriate equipment. However, it would be wrong to blame the applicators. The more fundamental causes are the failure of agrochemical distributors and managers to provide full information and protective equipment to workers and the prevalent features of NTAE production itself—particularly, pressures to maximize short-term returns and to produce high-quality cosmetically "perfect" produce and heavy reliance on agrochemicals. In many cases, credit agencies and fruit/vegetable brokers require producers to use pesticides and other specified production technologies as an obligation to receive credit; and these pressures are additional motivations for heavy chemical inputs.

2. Land-use, crop diversity, and food security:

The growth of NTAEs has inevitably involved changes in the use of land, soils, and resources. No comprehensive assessment has been done to determine the land use before NTAEs. Preliminary appraisals suggest that forest cover has been cleared for NTAEs in a few areas. More commonly, diverse subsistence crops or foods for local markets give way to new crops. These land-use changes may reduce food availability locally and therefore could hinder food security, but research is needed to determine exactly how NTAE production affects local food consumption and nutrition.[58]

The use of chemical fertilizers in NTAEs is widespread and high. All of the supervisors interviewed said that they regularly apply chemical fertilizers. Some 93 percent said that they also incorporate organic matter into the soil. The heavy use of chemical fertilizers has reportedly led to water pollution from runoff in some areas, posing risks to water users,[59] though how often is unknown. Measurements of soil erosion in NTAE farms have not been completed, but erosion appears to be a problem in some places where production takes place on steep slopes.

Other resource-related impacts arise from changes in crop diversity and species. The conversion to NTAEs often entails a switch from diverse polycultural systems to monocultural systems. Only 30 percent of those surveyed said they rotate crops, and only 23 percent said they used intercropping. The percentages are even lower in the coastal areas. As required by Northern markets, standardized foreign varieties and uniform genetic stock are used regularly. Although the loss of crop diversity and the introduction of exotic species can boost production efficiency and simplify marketing, they can also increase the agroecosystems' vulnerability to pests and diseases, as well as increase the economic risks of farmers who grow a single species. For example, when strawberries from Europe were introduced in Ecuador, the entire crop was wiped out during the second growing season in the highlands, by a disease unknown to experts from Ecuador, Europe, and the United States brought in to analyze the situation.[60] Producers had to switch varieties to deal with the problem.

D. Other socioeconomic challenges and uncertainties

Various problems are perceived as priorities in the NTAE sector. In the survey in the highland region, nearly half of 54 farm managers interviewed said that pests and diseases were the main source of losses in production, in spite of the heavy use of agrochemicals. Losses to pests usually top those from any other factor. Bad weather (noted by 26 percent of managers surveyed), market factors (noted by 17 percent), post-harvest handling (9 percent), and transport problems (2 percent) can also take an economic toll. Others interviewed outside the survey consider inadequate post-harvest transport systems, lack of refrigerated storage, and difficulties in meeting market demands key constraints too.

These constraints raise questions about Ecuador's institutional and technical capacities for sustaining NTAE production and marketing. Some investors and policy-makers interviewed believe that NTAE's economic sustainability depends largely on maintaining profitability and building a supportive policy environment and marketing services for NTAE growth. Although these changes are taking place to some extent, transport systems, technologies, and technical services still remain underdeveloped. Current services for NTAEs are largely dependent on foreign aid. It is questionable whether this support can be maintained, given rising financial limitations.

Another vital concern about the NTAE strategy is the *uncertainty* in the international market and demand for NTAE products. Indeed, the NTAE strategy has been described as "legal gambling."[61] Some producers subject to increasing competition for narrow market windows will inevitably get squeezed out, and though some market studies suggest that Northern demand for NTAEs will increase,[62] the market may not grow enough to absorb all the new supplies. Economic recession in the North, as well as changes in

consumers' tastes, can reduce the demand and thus limit opportunities. Many of these crops are "trendy" luxury foods—especially susceptible to instabilities. Moreover, USAID and other agencies are promoting the same NTAE crops in many other countries, so market saturation is a risk. The effects of possible changes in trade policies, such as GATT (General Agreement on Tariffs and Trade), are also uncertain: although the decline of trade barriers is likely to open up new opportunities, whether these changes will lead to equitable and sustainable growth for the rural population of Ecuador and other South American countries remains a question. Demand for NTAEs in local markets and in other parts of the region is very low and is unlikely to increase substantially since few crops match local dietary preferences and since those nontraditional crops sold in Ecuador have much lower prices than in export markets.

The recognition of these uncertainties, costs, and dilemmas points to the need for measures to ensure equity, sustainability, and socioeconomic viability in any NTAE strategy.

V. DISCUSSION AND IMPLICATIONS

A. Overview of central dilemmas

This preliminary analysis of the characteristics and impacts of NTAEs in Ecuador higlights opportunities and challenges faced by producers, exporters and policy-makers in North and South. It also shows how economic production, ecological factors, and social conditions are interlinked. The overall benefits and costs of NTAEs cannot be quantified, given the remaining unknowns. But it is certain that the NTAE strategy entails significant risks as well as benefits. Growth of this sector along current lines probably cannot fulfill the needs of the majority of rural Ecuadorians. Currently, most benefits are being reaped by relatively few companies, and very few resource-poor farmers can meet the entrance requirements of NTAE production.

These socioeconomic and environmental predicaments have also dampened NTAE production in other countries, such as Mexico and Central American nations. In Guatemala, for example, many small farmers producing NTAEs have been squeezed out of the market by larger producers and have borne high losses when their produce shipments have been rejected for violations of residue standards.[63]

The proximate causes of environmental and socioeconomic problems in this sector often include lack of information or capital. However, the *root* causes are generally associated with inequitable agrarian structures , the intrinsic features of NTAE production, along with unstable international market conditions and skewed development policies. By neglecting these root causes and focusing excessively on short-term maximization of export earning, agricultural policy-makers and development agencies and policies may be sacrificing the future of the majority of Ecuador's people. Although wage earnings from NTAE production help some families boost their income and purchasing power, the "trickle down" effects appear minimal, local food production still stagnates, and hunger and insecurity among the majority of rural people continue to grow.[64]

These dilemmas raise concerns about the future of this sector: Should development agencies continue funding this strategy, in view of other pressing social needs and the problems with NTAEs? Could the benefits of NTAE growth be spread more widely? Can support for export growth become better balanced to ensure that sufficient attention is given to local food security needs for the majority of the rural poor? Even if the private sector can sustain NTAE growth independently, these unanswered questions remain as critical challenges.

B. Emerging responses

A few of the concerns identified here are being addressed by PROEXANT and other institutions. For example, PROEXANT (supported by AID) and government agencies are attempting to improve economic capacities for NTAE marketing through promotion programs, changes in export regulations, and the provision of information and services. Some officers in PROEXANT and in AID have begun to raise questions about NTAEs' sustainability as well. PROEXANT's project on plant protection and pesticide/pest management includes such activities as training seminars on pesticide precautions and experiments in the use of biological control methods. APHIS from the United States and the Plant Protection Division of Ecuador's Ministry of Agriculture are assisting these efforts. A few other agencies and private companies, including FUNDAGRO's organic agriculture project and LATENRECO, are also developing biological control methods, such as *trichogramma*, for nontraditional crops. Production of organic NTAEs is also being researched and tried by the FUNDAGRO project, which has enjoyed considerable success in experimental plots.

Although these efforts are important, alone they cannot meet the urgent needs in this context; the lack of attention to environmental and social impacts may jeopardize authentic socioeconomic development goals—feeding poor people and ensuring environmental health.

C. Implications for policy changes, actions, and research

To avoid the negative impacts of NTAEs and to make agriculture in Ecuador more sustainable, government institutions and the private sector in both the United States and Ecuador will have to make comprehensive changes in agricultural development strategies, addressing the root causes of the problems and will also need to coordinate their efforts in this context. Environmental policies and measures cannot be separated from production and economic policies; rather they must be linked together.

1. Policy and institutional reforms

Although policies increasingly favor the expansion of NTAEs, additional policy and institutional reforms will help minimize the adverse social impacts of this course of action, support local food needs, and make agriculture more sustainable.

Both policy dialogue and decision-making on agricultural development need to involve a broader cross-section of interests. Currently, a narrow range of institutions participates in NTAE decision-making. Absent are representatives of environmental NGOs, public sector environmental agencies, workers' associations, small farmers' associations, public health institutions, and agroecology programs. Including the interests and ideas of all parties directly affected or interested in this field will help translate concerns about social and economic sustainability into policy changes.

More specifically, the following policy reforms can help to mitigate negative environmental impacts and build sustainability and equity of agricultural production:

- improved enforcement of pesticide policies and labor laws;
- incentives for farmers to adopt nonchemical pest control, soil conservation, and agroforestry;
- removing subsidies for using high-chemical-inputs;
- NTAE marketing services geared to meet the needs of farmers who have little land and capital;
- consistency and clarity of standards for residue tolerances and phytosanitary requirements;
- regulations to assure access and security of land tenure and resources for small holders;
- effective environmental impact reviews for agricultural policies and activities; and
- policy support for meeting local food needs, and to improve food security and nutrition needs of the poor and to balance current support for exports.

Economic policies affecting NTAEs also need to be reformed. For example, credit policies and import/export tariffs should be reformed to reduce risks and to increase the stability and equity of market opportunities for NTAE producers. Since such potential changes raise complexities and trade-offs that cannot be resolved easily, determining the specific reforms requires detailed analyses—outside the scope of this paper and that should be taken up in participatory discussions.

Some of these macroeconomic policy changes must be made by policy-makers in the United States and other importing countries. For example, the United States should promote sustainable farming practices, including integrated pest management and minimal use of chemical inputs in NTAEs and other crops, relax esthetic standards to reduce pressures for high inputs of chemicals, support market opportunities and dissemination of information on organic markets, and develop policies to improve local food production and alleviate hunger. North American consumers also need to relax their demands for esthetic perfection of products and buy organic products, which could help relieve pressures for chemical-intensive inputs abroad. Public education can help inform consumers that their buying habits have social impacts overseas and that "perfect-looking" produce does not have higher nutritional value and, in fact, generally has higher chemical content.

To implement appropriate changes in NTAEs and enforce policy, institutional capacity-building is needed in ministries of agriculture, labor, and health. Better coordination among institutions working on environmental, agricultural, and social issues is essential. Reliable extension services are especially needed for farmers with few or modest resources. Extension programs that contribute to sustainability and productivity gains, such as soil conservation and IPM, should be carried out not only by PROEXANT, but also by the public sector. Current extension capacities also will need to be strengthened, which will require additional resources and the development of participatory approaches for farmer-extension interactions. At the same time, agrochemical companies should be *required by law* to give farmers and workers full information and technical assistance services related to the chemicals they sell.

2. Initiatives and reforms

The following initiatives would also help reduce negative impacts and improve opportunities in NTAE production:

a. Training & education on sound NTAE production

Educational opportunities for short-term training and courses on farming practices can help make agriculture more productive and sustainable. All NTAE farmers and managers, cooperatives, workers, extension agents, and input suppliers need such programs, and all managers surveyed want training in pest control and pesticide use. Although PROEXANT sponsors some training seminars, more opportunities are needed for small-holder farmers and workers; and universities, NGOs, and the private sector also need to contribute to training programs. Four priority issues in NTAE training are:

- the management of pests and pesticides (especially Integrated Pest Management);
- sound land use, based on land-use planning, sustainable tillage methods, intercropping, crop rotation, and soil conservation methods, such as use of cover crops, mulch, and manures;
- other agroecological principles and organic practices, including water and nutrient management;
- post-harvest management of products and quality control.

b. Cooperatives and market services for small farmers

Initiatives are needed to increase opportunities for small holders in NTAEs. Although experience shows that these small farmers can produce NTAEs efficiently and profitably through contracts or cooperatives, in Ecuador more efforts are needed to form cooperatives, community farmer associations, and marketing/collection centers. Measures are also needed to extend credit and technical services to them. Biases that impede small farmers, such as membership charges by PROEXANT, should be ended.

c. Workers' rights, security, and health

Actions are also needed to ensure that workers' rights are respected, that jobs are secure, that workers' health is protected, and that wages are fair. Effective enforcement of existing labor laws is a major part of this challenge. In addition, organizing among workers can sometimes help to improve workers' negotiation and bargaining capacities and can help the collective labor force to address these issues constructively. Such ambitious changes are difficult to achieve given current impediments to worker rights and unions in Ecuador, but are imperative to ensure that new jobs in NTAEs are secure and benefit more people.

d. Participatory approaches and empowerment

Direct participation of local groups and famers is also essential in the development of sustainable agriculture. NGOs, community groups, and farmer associations are emerging throughout Latin America, with strong capabilities as well as urgent needs for improving production. Such groups must not be left out of new economic growth strategies. The society and economy will benefit if they gain support and full involvement in decision-making and in the process of agricultural development.

e. Crop diversity and organic NTAEs

When decisions are made on priority crops for NTAE promotion, more attention needs to be given to the adaptability of the crop to the local environmental conditions and local farmers' familiarity with those crops. To increase possibilities for small holders, it makes sense to focus on crops that they have traditionally produced—such as quinoa and tomatoes—often with little or no chemical inputs, and that also are desired by Northern consumers. Crop diversity within NTAE plantations should be encouraged to reduce reliance on monocultures that are subject to fluctuating demands and prices. In particular, the expansion of organic products for export has great promise, so market research and experimentation on high-value organic products is likely to pay off.

f. NTAE processing

Capital, technological changes, and improvements in infrastructure are needed to develop capacities for processing NTAEs, especially for pineapple, tomatoes, and other fruit produced mainly for canning and juicing. Subject to less strict requirements than fresh fruit exports, processed fruit requires lower inputs of chemicals in production, and waste would fall off dramatically if fruit could be exported canned. The development of processing plants would also generate new jobs, and support rural businesses.

3. Research gaps

As this report shows, many gaps remain in the understanding of NTAE impacts, characteristics, and potential. As production of NTAEs grows, data on many aspects must be improved. Several research priorities have emerged from this analysis and from multisectoral workshops in Ecuador:

- Impacts of pesticides and the role of Integrated Pest Management methods for NTAE production;
- Production practices and markets for organic products;
- Worker health/risks (especially for women) in NTAE production and processing;
- Distribution of land and economic benefits of increased NTAE earnings and foreign investment;
- Impacts of contracting arrangements for small-holder involvement in Ecuador's NTAEs; and
- The effects of trade liberalization policies on the practices, resources and well-being of the poor.

D. Challenges for the future

The Ecuador case provides general lessons about the problems and promises of NTAEs. It also illustrates dilemmas confronting export-oriented economic policies more generally. Reforms and actions like those identified here may help other countries avoid impediments and weaknesses in the NTAE sector. A more fundamental change in the prevailing agricultural development paradigm may also be required to generate lasting social and economic benefits in rural development strategies. Integrating environmental sustainability and equity concerns into agriculture is crucial to the productivity and viability of any development strategy.

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29. Information in this section is based on interviews from decision-makers, producers, and analysts in this field.

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50. Unpublished data from the Food and Drug Administration of the United States, 1992.

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Note

This Center Bulletin reports the findings of preliminary field research and participatory workshops in Ecuador, as part of a project on "Environmental and Social Challenges of Nontraditional Agroexport Policies in Latin America." This project is being undertaken collaboratively by the Sustainable Agriculture Program of the Center for International Development and Environment of WRI and the Universidad San Francisco de Quito, along with the Centro de Estudios y Planificacion Economica y Social, the US Agency for International Development, and other organizations.

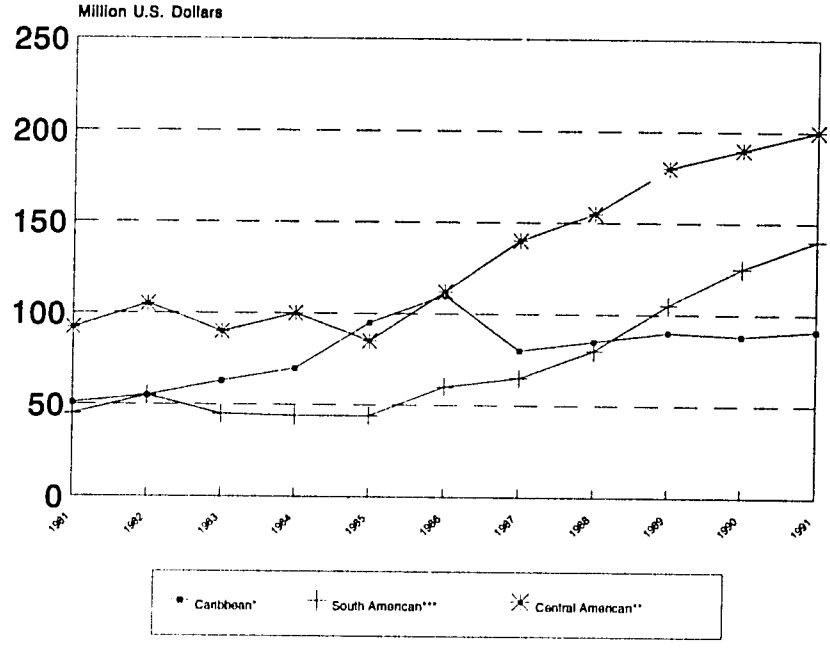
As part of this project, proceedings from workshops on this subject have been published in a book entitled: *Desafios en la Agroexportacion Notradicional: Impactos Ambientales y Sociales*, edited by William Waters, published by WRI and USFQ, Quito, 1993. This book is available through USFQ in Quito or WRI in Washington DC. Additional field work is being carried out in 1994 in Ecuador, Guatemala and other countries; and results will be published in a WRI research report in late 1994.

ACRONYMS

APHIS	Animal Plant Health Inspection Service (in USDA)
CFN	Corporación Financiera Nacional
FDA	Food and Drug Administration of the United States
FEDEXPOR	Federación Ecuatoriana de Exportaciones
IDB	InterAmerican Development Bank
IPM	Integrated Pest Management
ISI	Import Substitution Industrialization
NGO	Nongovernmental Organizations
NTAEs	Nontraditional Agricultural Exports (NTAX is another acronym used for the same term)
NTE	Nontraditional Export
PROEXANT	Promoción de Exportaciónes Agricolas Notradicionales
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

APPENDIX

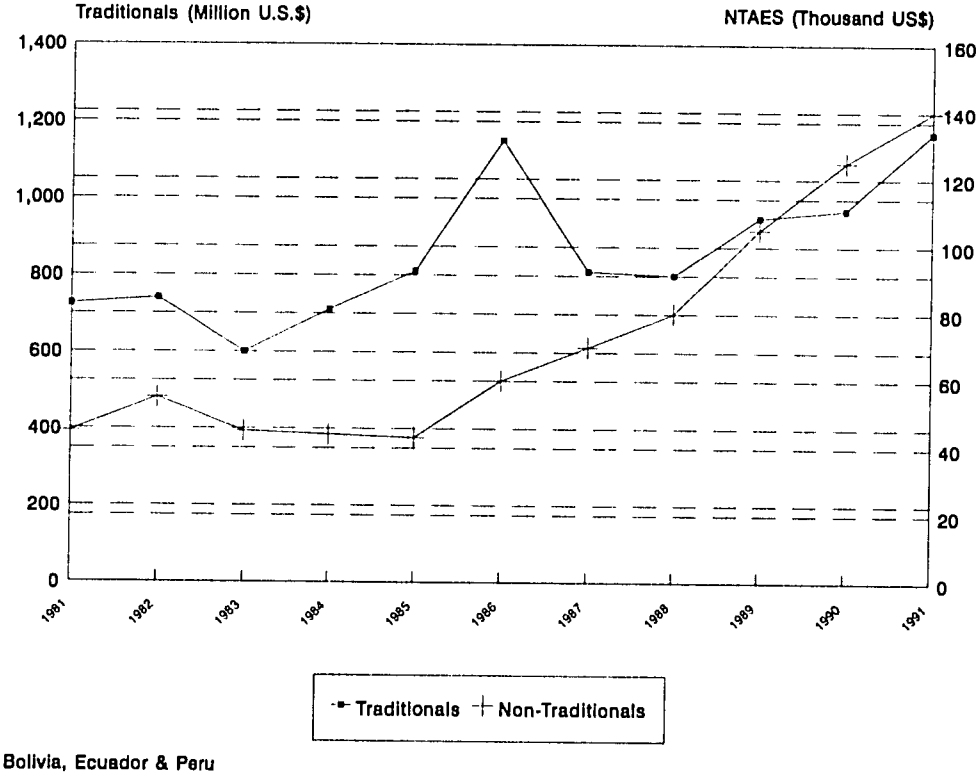
Figure A. Trends in Non-Traditional Agricultural Exports (NTAES) in Latin America & the Caribbean



NTAES = fruits and vegetables, minus bananas
Source FAO AGROSTAT

Regions: *Belize, Haiti, Dominican Republic, Jamaica
**Costa Rica, El Salvador, Guatemala, Honduras, Panama
***Bolivia, Ecuador, Peru

Figure B. Trends in Traditional and Non-Traditional Agricultural Exports in South American Countries



*Includes Bolivia, Ecuador & Peru

Source: FAO AGROSTAT

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By Aaron Zazueta

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By Carrie A. Meyer

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