



**AMERICAN UNIVERSITY**  
W A S H I N G T O N , D C

**Department of Economics**  
**Working Paper Series**

**Sustainable Floriculture in Ecuador**

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No. 2005-03

March 2005

**<http://www.american.edu/cas/econ/workpap.htm>**

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# Sustainable Floriculture in Ecuador

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## Abstract

This article explores the causes and consequences of the export boom in fresh cut flowers from Ecuador. Between the 1980s and the present, flower exports rose from almost nothing to 9 percent of the country's nonpetroleum export earnings. This research asks whether flower exports can continue to expand. It also examines the economic, social, and cultural impact of the flower boom on the regions of Ecuador where the flowers are cultivated. Finally, the article discusses the environmental impact of floriculture on workers in the industry.

**Key words:** Floriculture, Gender relations, Environment and health, Nontraditional exports, Flowers, Export boom, Ecuador, Latin America

Ecuador is one of the poorest countries in South America and *per capita* income (PPP) has been essentially unchanged since the early 1980s. The extraordinarily rapid growth of the flower industry is one of the few success stories in the country's dismal economic history since the end of the petroleum boom in 1982. Flower exports began in 1983 and now comprise 9 percent of the country's nonpetroleum export earnings. Cut flowers are Ecuador's third largest export after petroleum and bananas (BCE, 2003, Table 3.2.4). Can the flower boom of the 1980s and 1990s continue? If it does, will this development be socially and culturally sustainable, that is, will flower exports support a prosperous and equitable development path? Lastly, can this be done without bringing unsustainable environmental degradation?

To provide a basis for answering the first question about the continued growth of Ecuadorean floriculture, the paper briefly discusses the origins of the flower boom and then examines the role of potential competitors in the global market for flowers, the availability of land and labor for flower cultivation, and the land productivity of the country's agricultural exports. The remainder of the paper is a kind of score card for the industry: what are the positive economic, social, and cultural developments brought about by the growth of floriculture and what are its private and social environmental costs.

Ecuador=s flower boom is ultimately based on the country=s geography. The region in which flowers are cultivated in Ecuador straddles the equator and so has optimal sunlight conditions. Almost all of the flowers are grown at high altitudes where rich volcanic soils, cool temperatures, and abundant rainfall make it possible to produce some of the highest quality flowers in the world. Labor and land costs are low. The flowers are grown only four hours by air from Miami, the main distribution center in the United States for imported flowers.

Despite these advantages, Ecuador was not in a position to produce and market flowers profitably until a global marketplace for flowers had been created. (For a full discussion of this topic with extensive citations of the literature, see Sawers 2005.) The United States buys most of Ecuador=s flowers and the root of Ecuador=s success in exporting flowers was the restructuring of the US flower market that began in the 1950s. Until then, the chief market for flowers in the United States was in the Northeast and most flowers were grown nearby to economize on transport costs. With the new interstate highway system and cheap air transport, flower cultivation moved from the cold, dark (because of its high latitude) Northeast with its high labor costs to sunnier climates with low wages. Flower cultivation for the US market began shifting to Florida, California, and Colorado in the 1950s. Colombia began exporting flowers to the United States in 1967. Colombia had better sunlight conditions because of its latitude and much cheaper labor and land than did any part of the United States. An avalanche of cheap Colombian flowers produced a restructuring of the institutional framework in which flowers were marketed. Supermarkets and other high volume, low mark-up distributors took over the majority of sales from independent florists. Miami and Amsterdam became giant hubs in flowers= global marketing chain. New forms of wholesaling and distribution were invented. Flowers could be harvested Monday afternoon near Bogota, arrive in Miami the next morning, be trucked to Seattle or Chicago by Thursday, and appear on the shelves of neighborhood grocery stores on Friday morning. Cheap Colombian flowers remade the US market and created an opening that Ecuador would soon exploit.

Colombia=s early success in penetrating the US market was undermined in the 1980s by growing violence and lawlessness in the country and increasingly restrictive economic policies that discouraged exports. Ecuador, in contrast, moved in the opposite direction. Until the debt crisis in 1982, the country had pursued an inward-looking economic strategy that penalized exports in many different ways. The first, tentative, steps toward policy reform began in 1983, but growing political and economic chaos in 1987 and 1988 reversed the process. Then, between 1989 and 1994, the country took major steps to integrate into the global economy. The government slashed tariffs, sharply devalued the exchange rate, maintained real exchange rates during 1989B1994 at historic lows, eliminated many bureaucratic obstacles to exporting, and kept inflation in check. During this period, Ecuador became one of the most open economies in Latin America. The combination of increasing difficulties for flower exporters in Colombia and a more open trade regime in Ecuador produced an explosive growth in flower exports from Ecuador. Other important factors were the elimination of US tariffs on flower imports from the Andean countries in 1992 plus the dramatic growth in the Eastern European market after the breakup of the Soviet Union in 1991. Flower export earnings in real terms (that is, adjusted for inflation) grew 114 percent in 1989 B the year that serious policy reform began B and then averaged 42 percent growth annually until 1995.

## Economic Sustainability

Flower exports from Ecuador can be expected to continue to grow for the foreseeable future. The flower boom wilted in the late 1990s as growth rates of most other exports from Ecuador also slowed or reversed because of the unraveling political and economic crisis. A meltdown of the economy, a run on the currency, skyrocketing real interest rates, and a quasi-coup that forced the resignation of the president combined with erupting volcanoes, demonstrations that barricaded the highways to the airport, rain that slowed the growth of flowers and produced landslides that blocked the roads not filled with demonstrators led to the first ever decline in flower exports in 2000. Since then, the industry has rebounded; real earnings from flower exports in 2004 were 75 percent higher than in 1999. Given Ecuador's extraordinary geographical advantages in flower cultivation, given the steadily growing demand for flowers in the global market place, and given the country's firm commitment to an open trade regime, one can be fairly confident that flower cultivation in Ecuador will continue to expand.<sup>1</sup> Wages remain low and there is abundant land for flower cultivation. Renovation of the airport in Quito was recently completed, and a new airport more accessible to the areas of flower cultivation is scheduled to open in 2007. There are thus no resource constraints that will impede the expansion of floriculture in the Ecuadorian Sierra.

Flowers are not like soybeans, cattle ranches, or tree farms that are land extensive and produce products with modest value. Flower cultivation is a land- and labor-intensive activity with high land productivity (that is, high market value of output per hectare). Flowers have the highest land productivity of any major crop exported from Ecuador.<sup>2</sup> In 2004, flower exports earned \$9437 per hectare. Available data do not allow us to compare other exports with flowers after 2000, but in that year, flower exports generated \$6539 per hectare while bananas earned only \$3252.<sup>3</sup> (Bananas are Ecuador's most important agricultural export and Ecuador is the world's largest exporter of bananas.) The land productivity of no other major agricultural export comes close to that of flowers. In 2000, cocoa earned only \$192 per hectare and coffee earned \$159 per hectare.<sup>4</sup> Thus, to produce a given amount of export earnings, flowers require the least amount of land, and by that measure is Ecuador's most sustainable export crop.

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<sup>1</sup> About sixty countries now export flowers, including many developing countries, such as Kenya and India, with wages that are even lower than Ecuador's. Some of those countries have growing conditions that are nearly as favorable as those found in Ecuador, but none of them combines prime growing conditions with the crucially important proximity to the US market. If Colombia can ever rein in the violence that has plagued the country and put its economy on a sound basis, it may again become a threat to Ecuador's flower growers, but no other countries have the potential to challenge Ecuador's position in the US market.

<sup>2</sup> Unpublished data from Expoflores; BCE 2002; and Servicio de Información Agropecuaria del Ministerio de Agricultura y Ganadería del Ecuador, *Ecuador: Principales Productos Agrícolas: Superficie*, <http://www.sica.gov.ec/agro/docs/produccion.htm>.

<sup>3</sup> Banana prices were low in 2000, but flowers also performed better than bananas in 1997 before the slump in banana prices. In that year, flower exports generated \$5822 per hectare while bananas earned \$5344. Since 1997, Ecuador has produced ever higher quality flowers and has shifted from low value carnations and chrysanthemums to high-value roses, so land productivity in floriculture has risen steadily. In contrast, banana yields are stable, so flowers' advantage over bananas continues to grow.

<sup>4</sup> Even in the boom year of 1994 after a frost in Brazil led to a tripling of prices, coffee earned only \$1035 per hectare.

## Social and Cultural Sustainability

The growth of the labor-intensive floriculture industry in Ecuador has produced a strongly positive economic effect on communities in which flowers are cultivated. The Ecuadorian flower industry is highly concentrated spatially. About 60 percent of the flowers are cultivated in a single province (Pichincha), and another 20 percent are grown in the two adjacent provinces (Cotopaxi and Imbabura). These three provinces were among the poorest in Ecuador in 1990 when the flower boom was getting under way. In 1990, three quarters of the rural population of Pichincha Province was classified as poor as was 85 percent of the rural population in Cotopaxi and Imbabura (PNUD 1999, 168, 174). There are now over 60,000 workers employed by flower growers in Ecuador.<sup>5</sup> In the three provinces where 80 percent of the flowers are grown, employees of flower growers amount to 12 percent of the rural population aged 15 to 44.<sup>6</sup> Almost surely an even greater number were employed directly by other firms in the industry in transporting the flowers, manufacturing and selling supplies to growers, manufacturing irrigation equipment, and in other ancillary activities. The development of an industry that employs nearly a quarter of the rural working age population (not counting multiplier effects, which could be as large as the direct employment) has had an extraordinary impact on the lives of the rural poor. The flower boom, has raised household incomes dramatically, increased labor force participation, and slowed or reversed rural-to-urban migration.<sup>7</sup>

The restructuring of the Ecuadorean economy that began during the petroleum boom of the 1970s eroded the near-feudal system of land tenure that had prevailed in the Sierra. It created a rural proletariat and a system of commercial agriculture in the highlands where flower cultivation would later flourish. Workers were pushed off the land to which they had been bound by tradition if not by formal contract. They began farming the steep hillsides above the valley bottoms, which were turned into dairy farms. The displaced workers took wage jobs in commercial agriculture or moved into the cities. The rural-urban exodus was preponderantly masculine, so Sierran agriculture became the province of women, older adults, and children in the two decades before the flower boom (Waters 1997, 55).

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<sup>5</sup> Unpublished data from the industry's trade association, Expoflores, reports about 38,000 workers employed by flower growers in 2004. Since about 60 percent of growers are affiliated with Expoflores, there are about 60,000 workers in total.

<sup>6</sup> These estimates are based on provincial population data from the 2001 Census using data from the web site of the Instituto Nacional de Estadística y Censos (<http://www.inec.gov.ec>). I multiplied the rural population in each of the three provinces by the percent of the national population between age 15 and 44 to find the working age rural population. Unpublished data from Expoflores allowed me to estimate the number of flower workers in the three provinces. Virtually all of the workers in the flower fields are between 15 and 44 years old.

<sup>7</sup> The proportion of the population in Imbabura living in rural areas *grew* from 21 to 50 percent between 1950 and 2001. In Cotopaxi, the proportion grew from 11 to 27 percent. Almost everywhere in the developing world, rural-to-urban migration is the rule. In contrast, the flower industry in Ecuador has generated such prosperity in those two provinces that the rural population has gained on the urban population. In Pichincha Province, the flower boom has surely slowed migration to its major city, Quito. (Data are from the web site of the Instituto Nacional de Estadística y Censos at <http://www.inec.gov.ec>.) Another way to think about those numbers is that the percent of the rural population employed in floriculture would have been substantially higher if the rural population as a proportion of the total had continued to shrink as it did elsewhere in Ecuador and in the developing world.

Women comprise 60 percent of the floriculture workers in Ecuador. Export diversification (that is, the expansion of nontraditional exports) has often produced employment growth in developing countries (since nontraditional exports tend to be labor intensive), especially of women (Raynolds 1998, 2002). Thus, Ecuador=s experience has been similar to that of many other developing countries. Other than a job in the flower industry, the only wage work open to women in the Sierran countryside is poorly paid domestic service. Women in Ecuador=s flower industry earn wages that are a large multiple of wages of domestic service workers (Korovkin 2003, 24). Flower workers also receive health and retirement benefits that household servants do not have, and many women have supervisory and technical positions not open to women in other industries (Faulkner and Lawson 1991). Women=s wages in other sectors of Ecuador=s economy are generally about one third of men=s, but there are no important gender differences in wages in the floriculture industry (World Bank 2003, 93). This unprecedented growth in female wage labor is sowing the seeds of an economic, social, and cultural revolution in the communities in which it is concentrated.

The growth of women=s income in the areas of floriculture in Ecuador have transformed gender relations. In the areas where flowers are grown, it is now considered >normal= for women to be wage workers by both men and women, even though areas where flowers are not cultivated have retained their traditional resistance to female labor force participation (Newman et al. 2001, 29B30). The central role of women as their families= breadwinners and their ownership of their earnings has changed the social position of the women in the family and in the community, raised their self esteem, reduced violence toward women, and given them more authority within the family, including the power to decide how money is spent and whether to become pregnant (Newman et al. 2001, 41, 44, 69, 74). Wage work in developing countries and elsewhere is often associated with a >double burden,= that is, the job outside the home plus the continuing responsibility for housework. That has been found among Colombian flower workers (Meier 1999, 282). A time-use study of female floriculture workers in Ecuador, however, shows that married men help with enough of the housework so that the female flower workers in the flower growing regions of the country do not work more hours per day than women work elsewhere in the country (Newman 2001, 24B25; Newman et al. 2001, 54). Nevertheless, the men did not completely assume the housework that the women could no longer perform, leading to detrimental effects on the workers= families.

## **Environmental Sustainability**

The gains in income and in the socioeconomic status of women have surely been offset by growing health and environmental problems posed by the pesticides used in flower cultivation. Flowers in Ecuador as elsewhere are typically cultivated with large quantities of pesticides. The nature and extent of pesticide intoxication in Ecuador has received little attention by researchers. The only published quantitative study of the health effects of pesticide use in floriculture in Ecuador surveyed a single farm (Yépez Urbano 1997, 63B64). A few articles in the nonacademic press have addressed the subject (Tenenbaum 2002, A240B247; Wehner 2002; Thompson 2003). These studies presents anecdotal evidence from interviews with flower workers, doctors who treat them, epidemiologists, and municipal officials in flower growing

areas. The authors conclude that the health problems from pesticide use are ubiquitous in areas of flower cultivation in Ecuador.<sup>8</sup>

Frequently reported symptoms of pesticide intoxication include headaches, dizziness, rashes, nausea, blurred vision, infertility, low sperm count, diarrhea, birth defects, and stillbirths. Workers in the flower fields and greenhouses report lack of protective equipment and lack of information on the handling of dangerous chemicals. Other workers report being asked to perform their duties in rooms recently fumigated or to handle flowers soaked in preservatives or pesticides. One study stated that two thirds of the flower workers interviewed said they were worried about the chemicals with which they were required to work (Newman et al. 2001, 34).

It is important to note that some of Ecuador=s flower growers employ the best practice available. I observed, for example, a flower worker moving through a field with a vacuum that sucked insects from the roses and blew them into a cage strapped to his back. The cage had a mesh of sufficiently fine gauge to trap the large insects that harmed the flowers but sufficiently large gauge to permit the tiny wasps that were those harmful insects= predators to easily escape. Physically removing pests from the flowers reduced or eliminated the need for insecticides. That is just one example of integrated pest management. This technique is mostly used on food crops, but the idea is being applied to floriculture as well (Marga van der Meer, AWhat is Integrated Pest Management,@ *Flower Tech*, Vol. 1, No. 1, 1998, 74B79). Predator insects, nematodes, viruses, and bacteria are used to reduce harmful insects. Intercultation with plants that serve as hosts for predators, reducing planting densities, careful hygienic practices, and the use of insect traps are just a few of the many practices that can reduced or even eliminate the need for pesticides.

Pressure from consumers of flowers may encourage a reduction in pesticide use and the environmental damage it causes, but US consumers have not yet played the role. As of 2000, only 26 Ecuadorian flower growers (out of about 300) had joined the Flower Label Program certifying responsible use of pesticides. Germany sponsors the program and only 3 percent of Ecuadorian flowers are exported to Germany (Expoflores January 2000, 11B13, and unpublished data supplied by Expoflores). Most Ecuadorean growers do not come close to meeting the standards of the Flower Label Program. Indeed, many do not even comply with Ecuador=s own environmental protection laws. In 1999, only 60 percent of the 107 growers operating in Cayambe complied with that municipality=s strict environmental regulations (Malo 1999).

Excessive and careless use of pesticides is found not just in the flower fields in Ecuador or in other export crops grown in the country, but also in the cultivation of crops grown for the domestic market. Until the flower boom, most pesticides in Ecuador were used on coastal export crops such as bananas, but even at that time, small farmers in remote regions used a wide range of chemicals (Grieshop and Winter 1989, 395). Pesticide use has continued to grow in the last fifteen years on farms throughout Ecuador. The most careful studies of pesticide intoxication of

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<sup>8</sup> Pesticide intoxication of floriculture workers and the pesticide runoff from flower farms have been studied repeatedly in neighboring Colombia, though no one there has yet carried out statistical studies based on carefully drawn samples (Meier 1999, 283B284).

agricultural workers in Ecuador focus on potato growers, not flower workers. The staple carbohydrate for the rural poor in Ecuador is domestically grown potatoes, almost all of which are produced on small farms by farmers who barely eke out a living. Those farmers use a wide variety of pesticides and typically apply them multiple times per crop cycle (Crissman, Cole, and Carpio 1994, 594). Some of the pesticides in common use are illegal or otherwise restricted in the United States and other industrialized countries. Farmers know that pesticides can cause severe health problems, but few use protective equipment other than rubber boots even though most suffer from some form of pesticide intoxication (Crissman, Cole, and Carpio 1994, 596; Grieshop and Winter 1989, 396). Farmers in Ecuador have more severe symptoms of pesticide intoxication than does the nonfarm population (Antle, Cole, and Crissman 1998, 202).

Pesticide intoxication is not merely a problem in floriculture, or even in export-oriented agriculture in Ecuador, but is a problem in agriculture in general in the developing world. Furthermore, policy reform and trade liberalization did not make the problem worse B at least in Ecuador=s potato fields, but most likely ameliorated the problem of pesticide intoxication. Trade liberalization in the early 1990s lowered the real exchange rate and substantially raised the price of pesticides, all of which were imported (Antle et al.,1996). Simulation analysis of the effect of higher pesticide prices shows that the reforms of the 1990s should have reduced pesticide use in potato production. Even one individual sickened by pesticides is too many. It is important to keep in mind, however, that export-oriented agriculture in general or flowers specifically are not uniquely culpable.

Whereas it is technically possible to grow flowers without large quantities of pesticides and to protect workers from those pesticides that are used, there is no indication that Ecuadorean floriculture will become environmentally benign in the near future. About sixty countries B most of them in the developing world B export cut flowers. The global flower market has the same problem faced by all competitive markets not subject to effective regulation by a single government. We can expect that the number of environmentally-aware consumers who demand flowers grown without harmful chemicals will continue to grow, but no one should expect that this will happen rapidly. Organic food has been marketed for several decades and remains a small share of food consumption. Organic textiles are only just now coming on the market (Cortese 2005). We can also hope that the government of Ecuador will do a better job of enforcing its own environmental regulations, but we should also not expect dramatic improvement on that score, given the perennial weakness of the Ecuadorean state (Grindle and Thoumi 1993).

All indications suggest that flower exports will continue to play a major and probably increasing role in Ecuador=s economy. This will bring higher incomes to the rural population in the regions of flower cultivation and will continue to revolutionize gender relations. It is also likely that these gains will be at least in part offset by the health effects of excessive and improper use of pesticides.



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