Order Code RL33163

CRS Report for Congress
Received through the CRS Web

Drug Crop Eradication and Alternative Development in the Andes

November 18, 2005

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Drug Crop Eradication and Alternative Development in the Andes

Summary

The United States has supported drug crop eradication and alternative development programs in the Andes for decades. Colombia, Bolivia, and Peru collectively produce nearly the entire global supply of cocaine. In addition, Colombia has become a producer of high quality heroin, most of it destined for the United States and Europe. The United States provides counternarcotics assistance through the Andean Counterdrug Initiative (ACI). The program supports a number of missions, including interdiction of drug trafficking, illicit crop eradication, alternative development, and rule of law and democracy promotion. From FY2000 through FY2005, the United States has provided a total of about $4.3 billion in ACI funds.

Since 2001, coca cultivation in the Andes has been reduced by 22%, with the largest decrease occurring in Colombia, according to the State Department. Opium poppy crops, grown mainly in Colombia and from which heroin is made, have been reduced by 67%. However, the region was still capable of producing 640 metric tons of cocaine, and 3.8 metric tons of heroin in 2004, according to the White House Office of National Drug Control Policy.

Congress has expressed a number of concerns with regard to eradication, especially the health and environmental effects of aerial spraying, its sustainability and social consequences, and the reliability of drug crop estimates. With regard to alternative development, Congress has expressed interest in its effectiveness, its relationship to eradication, and the long-term sustainability of programs once they are started.

Drug crops are eradicated either manually or by aerial spraying of a herbicide mixture, the main ingredient being glyphosate, used commercially in the United States under the brand name of Roundup®. Eradication can be conducted with the voluntary agreement of growers, or involuntarily. Peru and Bolivia do not allow aerial eradication, which has proven to be controversial. Critics believe it poses risks to the environment and the health of inhabitants living in sprayed regions. Proponents believe it is the most effective and safe means to defoliate large areas being used for drug crop cultivation, thereby removing a lucrative source of income from the illegally armed Colombian groups.

Providing alternatives to drug crops is believed to be crucial to achieve effective eradication. This often includes technical support for farmers, marketing assistance, and strengthening the transportation infrastructure in order to get crops to market. The U.S. approach to alternative development (AD) is to link it to eradication. Growers who agree to eradicate are eligible for assistance.

This report will not be updated. For more information on the Andean Counterdrug Initiative, see CRS Report RL32337, *Andean Counterdrug Initiative (ACI) and Related Funding Programs: FY2005 Assistance*; and CRS Report RL32774, *Plan Colombia: A Progress Report*, both by Connie Veillette.

Contents

List of Figures

List of Tables

Drug Crop Eradication and Alternative Development in the Andes

Background

The United States has provided support to drug crop eradication programs in the Andes since the 1980s and for alternative development (AD) since at least the 1970s. Since 2000, the centerpiece of the U.S. counternarcotics policy has been the Andean Counterdrug Initiative (ACI), with Colombia the major recipient. The ACI program is the centerpiece of U.S. support for Plan Colombia, a six-year plan developed by Colombian President Pastrana in 1999. ACI supports a number of missions, including interdiction of drug trafficking, illicit crop eradication, alternative development, and rule of law and democracy promotion in the Andes.

The three main producers of cocaine — Colombia, Bolivia and Peru — collectively produce nearly the entire global supply. In addition, Colombia has become a producer of high quality heroin, most of it destined for the United States. Colombia became the main producer of coca and cocaine in the Andean region in 1997, according to the U.N. Office on Drugs and Crime's (UNODC) *World Drug Report 2005*. Peru was the leading producer of coca and coca paste until that time, which its growers shipped to Colombia for processing into cocaine. Bolivia is the third largest producer of coca.

The United States has made a significant commitment of funds and material support to help the Andean region fight drug trafficking since 2000. (See **Table 1**.) Congress passed legislation providing $1.3 billion in assistance for FY2000 (P.L. 106-246) for Colombia and its neighbors. From FY2000 through FY2005, the United States has provided a total of about $4.3 billion from the Andean Counterdrug Initiative account. For FY2006, the Administration requested, and Congress approved, $734.5 million in ACI funding (P.L. 109-102). The Department of Defense has spent approximately $1.2 billion from FY2000 through FY2005 from its counternarcotics account, managed by the U.S. Army Southern Command. The State Department's International Narcotics Control and Law Enforcement (INL) bureau is responsible for managing the ACI account. The countries considered part of the ACI include Bolivia, Brazil, Colombia, Ecuador, Panama, Peru, and Venezuela,[1] with most funding allocated for Colombia, Peru and Bolivia.

Additional funding for the Andean region is provided through the Foreign Military Financing (FMF) program and the International Military Education and Training (IMET) program, both managed by the State Department. FMF provides

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[1] Panama and Brazil are not considered Andean countries, but share borders with Colombia. Bolivia is an Andean country, but does not border Colombia.

grants to foreign nations to purchase U.S. defense equipment, services, and training. FMF assistance to Colombia, Peru, and Bolivia has the objective of establishing and strengthening national authority in remote areas that are prone to drug trafficking, and related activities of illegally armed groups. Some FMF funding has been used for infrastructure protection of oil pipelines in Colombia. The IMET program provides training for foreign militaries. Its objectives are to improve defense capabilities, develop professional and personal relationships between U.S. and foreign militaries, and influence these forces in support of democratic governance. Training focuses on the manner in which military organizations function under civilian control, civil-military relations, military justice systems, military doctrine, strategic planning, and operational procedures.

Table 1. U.S. Drug - Related Foreign Assistance to the Andean Region, FY2000-FY2006

(in millions U.S. $)

FY	ACI	FMF	IMET	Total
FY2000	1,174.8	—	2.4	1,177.2
FY2001	154.8	—	2.8	157.6
FY2002	651.0	3.5	3.0	657.5
FY2003	842.5	21.1	3.2	866.8
FY2004	726.7	102.5	2.3	831.5
FY2005	725.0	103.2	3.1	831.3
FY2006	734.5	94.0	3.5	832.0
Total	5,009.3	324.3	20.3	5,353.9

Source: Congressional Budget Justifications, Foreign Operations FY2002-FY2006; U.S. Department of State's Washington File, "U.S. Support for Plan Colombia, FY2000 Emergency Supplemental Appropriations," July 5, 2000.

Note: ACI figures reflect funding for all nations considered a part of the Andean Counterdrug Initiative. FMF and IMET figures are for Bolivia, Colombia, Ecuador, and Peru. FY2006 figures for FMF and IMET are amounts proposed by the Administration in its budget request.

ACI funds are divided between programs that support eradication and interdiction efforts, as well as those focused on alternative development and democratic institution building. On the interdiction side, programs train and support national police and military forces, provide communications and intelligence systems, support the maintenance and operations of host country aerial eradication aircraft, and improve infrastructure related to counternarcotics activities. On the alternative development side, funds support development programs in drug crop growing areas, including infrastructure, and marketing and technical support for alternative crops. It also includes assistance for internally displaced persons, promotion of the rule of law, and expansion of judicial capabilities.

Table 2. ACI Funding Eradication versus Alternative Development, FY2000-FY2006
(in millions U.S. $)

FY	Colombia		Peru		Bolivia	
	Eradic.	AD	Eradic.	AD	Eradic.	AD
FY2000	686.4	208.0	55.0	25.0	57.0	101.0
FY2001	48.0	—	21.0	27.0	32.0	20.0
FY2002	243.5	136.4	75.0	67.5	48.0	39.6
FY2003	412.0	168.2	59.5	68.6	49.0	41.7
FY2004	324.6	159.3	66.3	49.7	49.2	41.8
FY2005	310.7	152.1	61.5	53.9	48.6	41.7
FY2006	310.9	158.6	59.0	49.0	43.0	37.0
Totals	2,336.1	982.6	397.3	340.7	326.8	322.8

Note: Eradication figures include interdiction programs; AD figures include institution building programs. The FY2006 figures are the amounts provided in the FY2006 Foreign Operations Appropriations Act, P.L. 109-102. Other figures are drawn from Foreign Operations annual congressional budget justifications, FY2002 through FY2006.

Extent of Drug Crop Cultivation

The State Department reports that the area under coca cultivation in the Andes in 2003 was 428,595 acres, down from a high point of 552,763 acres in 2001, representing a 22% decline. The largest decrease has occurred in Colombia, with a 32% decline in coca cultivation since 2001, the year that Colombian production reached its peak.[2] For 2004, the Office of National Drug Control Policy (ONDCP) reported no decrease in Colombian coca cultivation.[3]

The eradication of opium poppies, grown mainly in Colombia, has resulted in crop decreases from about 16,000 acres in 2001 to nearly 5,200 acres in 2004, representing a 67% decrease. The largest portion of the decrease occurred from 2003 to 2004 when cultivation was cut in half.[4]

Both Peru and Bolivia allow a small level of legal cultivation for indigenous use. Coca leaf use is a deeply rooted cultural tradition in which the leaf is chewed or made into tea, and is used as a stimulant, appetite suppressant, and treatment for

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[2] Some analysts use 1999 as the pre-Plan Colombia baseline, which would show a 7.5% reduction instead of 32%. U.S. State Department, *International Narcotics Control Strategy Report, Volume I, Drug and Chemical Control*, March 2005.

[3] White House Office of National Drug Control Policy, "2004 Coca and Opium Poppy Estimates for Colombia and the Andes," March 25, 2005.

[4] Ibid., U.S. State Department, INCSR, March 2005, and ONDCP, March 25, 2005.

stomach ailments. It is also used to ease altitude sickness. When chewed or used as tea, coca does not have a hallucinogenic effect, and has been compared to the effects of coffee. Bolivia's Law 1008 allows nearly 30,000 acres of legal coca, while Peru's 1978 General Law on Drugs permits about 28,000 acres. In Bolivia, coca cultivation is legal in the Yungas region and some parts of Chapare. Growers may sell their product to intermediaries who are licensed by the government drug agency that also controls two legal coca markets. Peruvian law requires that growers are registered, and obligates its 14,463 registered growers to sell their coca leaf to the state-owned firm, National Coca Enterprise (ENACO). In neither country are there clear demarcations for which exact cultivation areas are legal versus illegal. For example, while Bolivian law permits coca cultivation in the Yungas region, authorities have not identified which fields should be counted toward the 30,000 acre limit.[5]

Figure 1. Coca Cultivation 2004 as Percent of Global Total

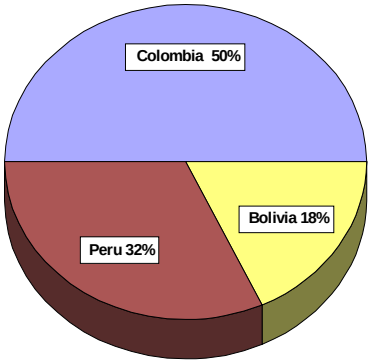
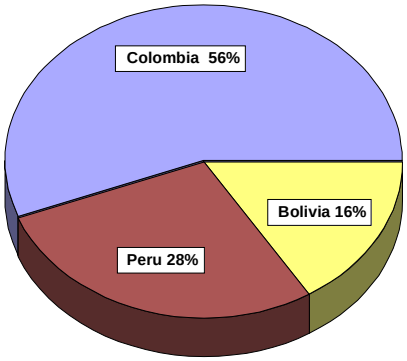


Figure 2. Cocaine Production 2004 as Percent of Global Total



Source: United Nations Office on Drugs and Crime, *Coca Cultivation in the Andean Region: A Survey of Bolivia, Colombia and Peru*, June 2005.

Eradication Programs

There are two types of eradication programs. Aerial eradication, often referred to as fumigation, involves dispersing the chemical glyphosate, an herbicide mixed with water and the surfactant Cosmo Flux 411F, from low-flying aircraft over illicit crops to kill or inhibit their growth. Drug crops can also be manually eradicated, often with the agreement of the grower, but also without his consent. Both aerial and manual eradication takes place in Colombia, while Bolivia and Peru allow only manual eradication. U.S. support for eradication programs is managed by the State Department's Bureau of International Narcotics and Law Enforcement Affairs (INL), and the Narcotics Affairs Section (NAS) of U.S. embassies. Spray missions are conducted by U.S.-hired contractors, through the State Department's Office of Interregional Aviation Support.

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[5] *Coca, Drugs and Social Protest in Bolivia and Peru*, Latin America Report No. 12, International Crisis Group, March 3, 2005.

Colombia. Unlike Peru and Bolivia, Colombia has no legal market for coca leaf, with all of it destined for processing into cocaine. There are few indigenous communities that use coca leaf for traditional, cultural, or medicinal purposes. Putumayo has been the principal coca growing area, but cultivation has now spread to more than 20 of Colombia's 32 regions.[6] Opium poppy is grown mainly in the mountainous regions of Tolima, Huila, Cauca, and Nariño. Poppy is grown on very small plots of land and interspersed with other crops, making its detection and eradication difficult.

When Plan Colombia began in 2000, the aerial eradication of coca and poppy crops with a glyphosate herbicide mixture became a key component of the Colombian and U.S. efforts to reduce the supply of illegal drugs entering the U.S. market. Glyphosate had previously been used aerially in the successful eradication of marijuana in the 1980s in Colombia. Spray operations are conducted by the Colombian National Police with U.S. support through the State Department's Office of Interregional Aviation. The United States provides technical and scientific advice, herbicide, fuel, spray aircraft, and a limited number of escort helicopters. Spray aircraft are piloted by U.S. citizens, Colombian, or third-country national contractors, and are accompanied by escort helicopters that carry combined U.S. civilian contractors or third-country nationals, and Colombian National Police crews. Spray aircraft use global positioning computer systems to identify locations of crops, with areas for spraying chosen by the Colombian government. There are currently 17 fixed-wing and 26 helicopters devoted to spraying operations. Aircraft are flying missions from three forward operating locations (FOL) in Colombia.[7]

Reductions in coca and opium poppy cultivation began to be seen by 2003. Some areas where aerial eradication took place experienced marked decreases — Meta, Caquetá, and Putumayo. But, these successes have been accompanied by increases in other areas — Antioquia, Nariño, and Guaviare.[8] Areas that have been manually eradicated, Vichada, Bolívar, and Cauca, have had lower rates of reduction. While manual eradication does not carry as many risks as the aerial program, the rate of eradication is much slower and requires more manhours with operations in rugged, inaccessible, and often hostile territory. A 1988 Government Accountability Office (GAO) report concluded that manual eradication had been unable to keep pace with new plantings, and so had a minimal effect on cultivation.[9] The United States Agency for International Development (USAID) supports voluntary agreements with communities in coca growing regions, whereby the communities themselves eradicate their drug crops in exchange for development assistance. More recently,

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[6] Contreras, Joseph, "Failed 'Plan,'" *Newsweek International*, August 29, 2005.

[7] U.S. Government Accountability Office, *Drug Control. Specific Performance Measures and Long-Term Costs for U.S. Programs in Colombia Have Not Been Developed*, GAO-03-783, June 16, 2003; and Contreras, Joseph, "Failed 'Plan,'" *Newsweek International*, August 29, 2005.

[8] "Drugs in Latin America: What Kind of Turning Point?," *Latin American Special Reports*, [http://www.latinnews.com], November 2003.

[9] U.S. Government Accountability Office, *Drug Control: U.S.-Supported Efforts in Colombia and Bolivia*, GAO/NSIAD-89-24, November 1988.

the government of Colombia has used demobilized right-wing paramilitary fighters, flying them to coca regions to manually eradicate crops.

Peru. Peru's support for eradication programs has varied historically, based on the political conditions in the country and the resolve of national governments. While once the largest producer of cocaine in the Andes, it is now second to Colombia. The traditional areas of coca cultivation are the Upper Huallaga/Monzon and the Apurimac/Ene Valleys, although the State Department has reported that dense cultivation is increasing in other areas. It also reports that there is an upward trend in opium poppy cultivation in northern Peru. Coca cultivation has decreased in Peru from its peak in 1995 and is considered an Andean success story. Some observers believe the reduction was due to several factors other than the eradication operations, including the following: the appearance of a soil fungus, Fusarium oxysporum in the Huallaga Valley; the decline of Colombia's dependence on Bolivian and Peruvian coca; and the successful dismantling of Colombia's drug cartels that were the principal buyers of Peruvian coca. This led to a collapse in coca prices in the early 1990s.[10] The government of Peru allows only the manual eradication of drug crops.

By the end of the 1980s, Peru was the world's leading producer of coca leaf, supplying 60% of world supply. Early in President Fujimori's government (1990-2000), he adopted an approach that emphasized alternative development and land titling, incorporating coca farmers into the formal economy, while de-emphasizing forced eradication. As his administration proceeded, Fujimori adopted policies that gave more authority to the military in drug matters, and combined counterinsurgency and drug control missions. Forced eradication was restarted in 1996 and increased in tempo toward the end of the 1990s. Eradication operations provoked the mobilization of coca growers, especially in light of unsubstantiated claims that spraying of crops was occurring. This led Fujimori to sign a decree prohibiting the use of chemical or biological defoliants in 2000. Under the Toledo government (2001 to present), alternative development programs using voluntary agreements have become again widely utilized, although forced eradication continues. Assistance for growers is provided, as long as they sign agreements to fully eradicate their crops. If an agreement is not signed, forced eradication occurs, and the grower reaps no assistance. The State Department reports that in 2004, about 18,500 acres were forcefully eradicated, while another 6,000 acres were part of the alternative development/voluntary eradication program.

Bolivia.[11] Political instability in Bolivia has resulted in the uneven application of counternarcotics policy over the years. Despite this, Bolivia has seen some successes in reducing cultivation, but some observers would argue, at the expense of social unrest. The two main coca growing regions are Chapare and Yungas. Since

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[10] Isaías Rojas, "Peru: Drug Control Policy, Human Rights, and Democracy," in *Drugs and Democracy in Latin America: The Impact of U.S. Policy*; Coletta A. Youngers and Eileen Rosin (Eds.), 2005; and *Coca, Drugs and Social Protest in Bolivia and Peru*, Latin America Report No. 12, International Crisis Group, March 3, 2005.

[11] For more information on Bolivia, see CRS Report RL32580, *Bolivia: Political Developments and Implications for U.S. Policy*, by Connie Veillette.

the beginning of *Plan Dignidad* in 1998, the counternarcotics policy of former President Banzer (1997-2001) that focused on increasing forced eradication, cultivation in the Chapare has decreased. It has, however, dramatically increased in the Yungas. The State Department reports that the increase is far above the legal limit. As in Peru, indigenous Bolivians believe coca is a cultural right and use it for cultural, spiritual, and medical purposes.

Total coca cultivation in Bolivia decreased from its peak in the mid-1990s of 118,000 acres to around 36,000 acres in 2000, but in 2001, coca cultivation began to increase again and to expand to new areas. In 2004, the State Department estimates that there were nearly 61,000 acres of coca crops.[12] Bolivian law states that only manual and mechanical methods can be used to eradicate, and prohibits the use of "chemical means, herbicides, biological agents, and defoliants."[13] While interim presidents have reaffirmed their support for counternarcotics policy, continuing political instability and the mobilization of coca growers' organizations, especially in the context of an upcoming presidential election, have led some observers to question the resolve of the national government. Both the State Department and the UNODC reported increases in coca cultivation during 2004.

Alternative Development Programs

Providing alternatives to drug crop cultivation is believed to be a crucial component to achieve effective eradication. U.S. alternative development programs are managed by the U.S. Agency for International Development, and often include technical support for farmers agreeing to give up their drug crops, marketing assistance, and the strengthening of transportation infrastructure in order to get crops to market.

Alternative development began in the mid-1970s in Bolivia, (Chapare region) and in the early 1980s in Peru (Upper Huallaga Valley), as coca crop substitution. The United States was the principal donor, with UNODC involvement beginning in 1984. U.S. alternative development strategies played a modest role in Colombia until 2000, when the United States started investing in AD as part of its support for Plan Colombia. The legal framework for AD in Peru is Law 22095, which outlaws all coca cultivation except that grown by farmers registered with the government agency, National Coca Enterprise (ENACO). Bolivia's Law 1008 permits legal coca cultivation only in traditional coca-growing areas. Under these laws, alternative development programs benefit farmers growing illicit coca, while those cultivating legal coca for traditional purposes fail to receive assistance.

The main feature of U.S.-supported alternative development programs is that they are tied to agreements by farmers and communities to eradicate coca crops. USAID's objectives are to encourage farmers to grow alternative crops and become part of the legal economy. After farmers agree to eradicate illicit crops, they receive

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[12] According to UNODC World Drug Report 2005, there were 124,291 acres in 1990 and 68,446 acres in 2004.

[13] Betsy Marsh, *Going to Extremes: The U.S.-Funded Aerial Eradication Program in Colombia*, Latin America Working Group, March 2004.

support for food crops, while plans for future cash crops are made. In a recognition that crop substitution is insufficient to realize sustainable development, projects are also undertaken to improve an affected area's infrastructure, such as road, water systems, schools and municipal buildings, which also provides employment opportunities for former coca farmers. Education, infrastructure, and health services are provided to make sure that coca and poppy growing regions would attract and support other economic activities.

Colombia. USAID works to strengthen Colombia's National Alternative Development Plan and the capabilities of local non-governmental organizations. By increasing licit economic opportunities, it is believed coca and poppy growers will be able to permanently give up illegal crops. Over the past five years, USAID reports that it established 62,964 hectares of legal crops, 31,461 hectares of forest land, and completed 918 social and productive infrastructure projects, benefitting over 54,780 families, in collaboration with local NGOs. In 2003, USAID started to support small- and medium-sized agribusiness and commercial forestry development activities. Projects cover areas such as wood projects, cocoa, coffee, rubber, oil palm, exotic fruits, medicinal herbs, and handcrafts in 30 of the 32 departments. Since 2000, the United States has allocated about $976 million for AD programs.

Peru. USAID describes its programs in Peru as a multi-sector approach that seeks to improve local governance, strengthen the rule of law, and increase the economic competitiveness of coca-growing areas. Its programs focus on generating temporary income to growers who voluntarily eradicate their crops, supporting basic services, and promoting community organization. USAID then seeks to promote sustainable economic and social development in and around primary coca-growing areas. This includes infrastructure projects, technical assistance and training to small farmers, private sector entrepreneurs, and government entities. The agency reports in its annual congressional budget justification for FY2006 that more than 27,000 families have voluntarily eradicated nearly 18,000 acres of coca since October 2002.

Since 2000, the United States has supported more than $330 million in AD programs. In 2004, USAID supported "legal productive activities" on about 49,000 acres, built or rehabilitated 134 schools, health facilities, and water systems, 205 kilometers of road, 12 bridges and irrigation projects, and brought electrification to six communities. Support for the rehabilitation and maintenance of a major highway out of the Huallaga Valley, a coca region, has eased the transportation of agricultural products to national markets. In 2004, USAID reports that 20,000 families made voluntary eradication agreements.

Bolivia. Bolivia has had the largest and longest running alternative development program in the Andes with USAID making major investments there. Since the start of the ACI, the United States has spent about $323 million on such programs. In the Chapare region, a coca growing area, USAID has focused on strengthening licit livelihoods, community development, legal land tenure, and access to justice. More recently, and in response to the decrease in cultivation there, USAID is adopting a more integrated approach that puts emphasis on sustainability and increased participation by municipalities to develop, implement, and monitor programs. In 2004, USAID assisted 28,290 rural families, and increased the number of licit jobs by 9,300 and licit cultivation by 21,000 acres in the region. Similar

programs are conducted in the Yungas, along with assistance for coffee cultivation and rural electrification projects.[14]

Issues for Congress

Congress has expressed a number of concerns with regard to eradication, including the following: the health and environmental effects of aerial spraying; the reliability of drug crop estimates; and the effectiveness and sustainability of eradication. With regard to alternative development, Congress has expressed interest in its effectiveness; its relationship with eradication; and the long-term sustainability of programs. Both eradication and alternative development face a number of challenges, some of which are general to the region, and others that are specific to the country in which they are conducted.

Health and Environmental Effects of Herbicides[15]

Since the inception of aerial coca crop eradication, Members of Congress have expressed concerns about the possible health and environmental effects of the herbicides used. There is also concern with the proposed use of aerial eradication in Colombia's national parks, which is currently prohibited by Colombian law. Congress has directed in annual Foreign Operations Appropriation legislation that the aerial spray program be certified by the U.S. State Department as causing no unreasonable risk to the environment or health of people living in sprayed areas. Congress has also directed that spraying in national parks can only occur if it is consistent with Colombian law, and no other viable alternatives exist.[16]

The program in Colombia uses a mixture of Roundup Ultra Herbicide®,[17] water, and Cosmo Flux 411F, which is a blend of two additives, whose identities are

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[14] Information on USAID programs in Colombia, Peru and Bolivia is drawn from USAID's Congressional Budget Justification for FY2006.

[15] This section prepared by Linda-Jo Schierow, Specialist in Environmental Policy, Research, Science and Industry Division, CRS.

[16] The term "unreasonable" is used in several environmental statutes, including the statute that authorizes EPA to regulate sale and use of pesticides, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). It generally is interpreted to require regulators to balance costs and benefits in making decisions.

[17] The Roundup formulation was determined based on the registration date (1994, according to U.S. EPA, Office of Pesticide Programs, "Details of the 2003 Consultation for the Department of State: Use of Pesticide for Coca and Poppy Eradication Program in Colombia." June 2003. p. 12. (Hereafter cited as U.S. EPA.)) and the concentration of glyphosate (41%, according to the Department of State, Bureau for International Narcotics and Law Enforcement Affairs, "Updated Report on Chemicals Used in the Colombian Aerial Eradication Program," December 2003). Roundup Ultra Herbicide® is the only glyphosate product that fits that description, according to EPA's database, the National Pesticide Information Retrieval System at [http://ppis.ceris.purdue.edu/htbin/rnamset.com], visited Oct. 20, 2005.

considered trade secrets.[18] The Roundup® product contains the active ingredient glyphosate, a surfactant — polyoxethylene alkylamine (POEA) — to aid penetration of foliage, and another unnamed additive.[19] The same herbicide mixture is used in Colombia for eradicating both coca plants and opium poppy, although because poppy is easier to eradicate, less glyphosate (relative to the amount of water) is needed in the formulation. Roundup Ultra Herbicide® (but not Cosmo Flux 411F) is registered, sold, and widely used in the United States, where it has generally been considered a relatively safe and environmentally friendly herbicide.[20]

Studies on Glyphosate. The State Department consulted with the U.S. Environmental Protection Agency (EPA) and reported in 2002 and 2003 that the EPA had found that "there is no evidence of significant human health or environmental risks from the spraying" in Colombia.[21] The State Department has certified four times since 2002 that the herbicide mixture poses no unreasonable risk to health or the environment, and that usage in Colombia is consistent with applications in the United States and with label recommendations.[22]

Both the EPA and the State Department have acknowledged that unintentional spraying of legal crops and natural vegetation, due to spray drift, is likely to kill plants downwind of coca fields.[23] But the State Department argues that such damage is reversible (that is, the forest re-grows and new crops may be planted) and not an unreasonable price to pay for drug eradication, given the severity of environmental and health impacts of coca production, processing, and distribution. Chemicals used by coca growers and processors include pesticides, herbicides (2,4-D and paraquat), kerosene, sulfuric acid, ammonia, and acetone.[24]

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[18] Manufacturers improve the performance of their pesticide products by adding substances that increase stickiness, tendency to spread so as to improve coverage, and other properties. "Adjuvant" is the term usually applied to such additives. The identity of these so-called "inert" ingredients often is kept secret to protect business interests, but is known to the federal agency that registers the product, which is EPA in the case of pesticide products.

[19] U.S. EPA, p. 13.

[20] The product name varies depending on concentration of the ingredients, but is most commonly known as Roundup®. Vision® is another name for the glyphosate plus POEA surfactant formulation.

[21] EPA's statements regarding the safety of the herbicide product support the State Department's position, but stipulate that they are based on information provided by the State Department about the pesticide formulation, application rates, and application methods in Colombia. In its 2002 report to the State Department, EPA requested field investigations of health complaints by Colombians, while the 2003 EPA report requested that such investigations be standardized and better documented.

[22] These certifications are available at [http://www.state.gov/p/inl/rls/rpt/aeicc/].

[23] U.S. EPA, Executive Summary.

[24] Charles W. Schmidt, "Battle Scars: Global Conflicts and Environmental Health," *Environmental Health Perspectives*, vol. 112, no. 17, Dec. 2004.

The State Department's 2005 certification is supported by a recent study by the Organization of American States (OAS).[25] The Inter-American Drug Abuse Control Commission (CICAD), an OAS agency, undertook a "science-based risk assessment of the human health and environmental effects" of glyphosate in response to a request from the United States, United Kingdom, and Colombia. The report concluded that neither glyphosate nor Cosmo Flux 411F presents "a significant risk to human health." With regard to the environment, CICAD determined that risks were minimal in most circumstances, but that spray drift poses moderate risks to aquatic organisms in shallow or static water. (Risks to aquatic life are discussed below.) The probability and extent of such impacts is unknown. The report concluded that based on available data, glyphosate has less environmental impact than cocaine and poppy production and processing, which also cause deforestation, displacement of flora and fauna, and damage to non-target plants and animals. (The risks of certain additives are discussed below). However, the report also recommended testing of other additives that might pose less risk to aquatic life as well as further study to better understand the potential for adverse effects on human health or the environment.

The annual certifications by the State Department and the CICAD study have been criticized by environmental groups and some researchers.[26] Criticism often centers around the composition of the herbicide mixture used in Colombia, which is different from that applied in the United States.[27] However, EPA knows the identities of the ingredients in Cosmo Flux 411F and has stated that they are "approved for use in/on food by EPA."[28] The State Department's certification mentions that the application rate for Cosmo Flux 411F is within the manufacturer's recommended application rate. In addition, the State Department provided EPA with data from six acute toxicity studies conducted using the mixture used in Colombia, as well as information about health complaints. Of the 5,000 health complaints received through 2004, half were "rejected as invalid, because it was determined that spraying did not take place in the areas in question on the dates claimed."[29] Compensation for lost crops was paid in 12 cases. In no instance did the U.S. embassy or the Colombian government determine that spraying caused harm to human health or wildlife.[30] Based on this information, EPA concluded in its 2003

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[25] OAS, CICAD, "Environmental and Human Health Assessment of the Aerial Spray Program for Coca and Poppy Control in Colombia," p. 121, at [http://www.cicad.oas.org/en/glifosateFinalReport.pdf], visited October 20, 2005.

[26] A number of organizations have been active in pressing for further studies of the glyphosate mixture used in Colombia, among them The World Wildlife Fund and Friends of the Earth.

[27] One additive in the blend sprayed in Colombia after 2002 is different from, and less toxic than, the adjuvant used prior to 2002, when EPA recommended a switch to a less toxic mixture.

[28] U.S. EPA, p. 14.

[29] Charles W. Schmidt, "Battle Scars: Global Conflicts and Environmental Health," *Environmental Health Perspectives*, vol. 112, no. 17, December 2004.

[30] Ibid.

report that "there are no risks of concern from [sic] dietary, mixer/loader/ applicator or field workers, or bystanders (including children)."[31]

Others who disagree with the conclusions reached by the State Department and CICAD question the applicability of toxicity data gathered in the United States to a tropical environment and its ecosystems. Rather, it is argued, studies should be conducted to assess effects on the forests and wildlife of Colombia, and information should be gathered from Colombians. One such study, requested by the Colombian Ombudsman's Office, and conducted along the Ecuador-Colombian border, reported that blood samples taken from 22 women showed genetic damage. The incidence of damage was far greater (500% and 800%) than found in two control groups.[32] The State Department is cooperating with the Colombian government to collect data on health complaints in the areas where spraying occurs, but such information is difficult to collect and to interpret.

Toxicity of Additives. Several recent scientific studies have led to conclusions that apparently conflict with those of previous studies and raise the possibility that spraying might lead to adverse effects on human health or the environment. The weight of recent evidence seems to be pointing not to glyphosate, but rather to POEA, the surfactant in Roundup®, as a potential hazard.[33] One study, at the University of Caen, France, found that human placental cells are sensitive to Roundup® at concentrations lower than those found in agricultural use. This study found that the effects of Roundup® were greater than those of glyphosate alone, indicating that adjuvants had their own effect, either independently or in combination with glyphosate.[34] A Chinese study found that POEA was more toxic to aquatic creatures and algae than Roundup, which in turn was more toxic than glyphosate.[35] Another study, by a University of Pittsburgh biologist, reported that Roundup® may be "extremely lethal" to amphibians. The researcher's experiments with North

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[31] U.S. EPA, Executive summary.

[32] Adolfo Maldonado, *Daños Genéticos en la Frontera de Ecuador por las Fumigaciones del Plan Colombia*, November 2003.

[33] For example, see "Are Pesticide 'Inerts' an Unrecognized Environmental Danger?," by Rebecca Renner in *Environmental Science & Technology Online News*, September 7, 2005. Also, the CICAD study cited above concluded that the toxicity of the Roundup plus Cosmo-Flux is greater than the toxicity of Roundup alone. Older studies that found adverse environmental effects due to Roundup or other glyphosate formulations are not cited here because they may have involved additives or contaminants that are no longer constituents of herbicide mixtures being sprayed in Colombia.

[34] Sophie Richard, Safa Moslemi, Herbert Sipahutar, Nora Benachour, and Tilles-Eric Seralini, "Differential Effects of Glyphosate and Roundup® on Human Placental Cells and Aromatase," *Environmental Health Perspectives*, vol. 113, no. 6, June 2005.

[35] M.T. Tsui and L.M. Chu, "Aquatic Toxicity of Glyphosate-Based Formulations: Comparison Between Different Organisms and the Effects of Environmental Factors," *Chemosphere*, vol. 52, no. 7, pp. 1189-1197.

American tadpoles produced high rates of mortality.[36] Similarly, experiments with young adult frogs and toads indicated a potential for significant toxicity.[37]

Spraying in National Parks. Because of the eradication program, some drug crop cultivation has moved to national parks. It is estimated that 28,000 acres of coca are being grown in Colombia's 49 national parks, a more than doubling of the 11,000 acres under cultivation three years ago. The Colombian government is now considering lifting its ban on spraying in the national parks. Critics fear that spraying will also kill many plant species in the jungles and mountains, and could also harm amphibians, mammals, and birds. Colombia's national parks contain a large number of diverse plant and animal species.[38]

Proponents of spraying in the national parks argue that coca cultivation does more harm to the environment than eradication. The processing of coca leaf into cocaine base is also harmful to the environment. Growers often clear forested land in order to plant crops, while traffickers do the same to build transportation routes and landing strips. The State Department reports that over the past 20 years, coca cultivation in the Andean region has resulted in the destruction of at least 5.9 million acres of rainforest. The processing of coca leaf into cocaine base involves the use of harsh precursor chemicals such as kerosene, ethyl ether, sulfuric acid, potassium permanganate, acetone, and thousands of tons of lime and carbide, which are allowed to seep into the water supply and soil, and contaminate the food chain. According to the Colombian government, traffickers have dumped more than one million tons of chemicals since the mid-1980s.

Alternative Methods. While the effects of coca and poppy production and processing may be more damaging to the environment and human health than crop eradication with glyphosate and Cosmo Flux 411F, eradication may motivate coca growers who lose their crops to start over in other, more remote parts of the forest, causing still more ecosystem destruction. If eradication is, nevertheless, the best option, then alternative methods of crop eradication might arguably be more benign.

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[36] Rick A. Relyea, "The Impact of Insecticides and Herbicides on the Biodiversity and Productivity of Aquatic Communities," *Ecological Applications*, vol. 15, no. 2, 2005, pp. 618-627, and Rick A. Relyea, "The Lethal Impact of Roundup® on Aquatic and Terrestrial Amphibians," *Ecological Applications*, vol. 15, no. 4, August 2005, pp. 1118-1124.

[37] Rick A. Relyea, Nancy M. Schoeppner, and Jason T. Hoverman, "Pesticides and Amphibians: The Importance of Community Context," *Ecological Applications*, vol. 15, no. 4, August 2005, pp. 1125-1124. For criticism of the earliest of these amphibian studies, see the paper "Response to `The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities,'" posted on the Monsanto website at [http://www.monsanto.com/monsanto/content/products/productivity/roundup/bkg_amphib_05a.pdf]. The biologist's response also is posted on the Internet at [http://www.pitt.edu/~relyea/Roundup.html], visited Oct. 18, 2005. In part, the researcher and pesticide company disagree on the likelihood that concentrations of glyphosate product might approach toxic levels in bodies of water where amphibians lay their eggs and larvae develop.

[38] Kim Housego, "Colombian Cocaine Blight Spreads into Nature Parks, Threatening Their Survival," *Associated Press*, September 27, 2005.

Some alternatives, such as eradication by hand, might be impractical, due to the terrain and hostility of drug growers.

Other methods might hold more promise. Biological controls for drug crops were discussed in a 1993 report to Congress by the Office of Technology Assessment.[39] Biological controls use living things or their byproducts to reduce the target plant pest to a tolerable level. The living things may be native to an area and natural enemies of the target plant, or they might be imported. In either case, to be effective in controlling pests, they first must be identified and then established in sufficient numbers in proximity to the targeted plants. At the same time, it is important to ensure that such biological agents are controlled to keep them from attacking or competing with non-targeted, native plants and animals. It also would be necessary to consider the potential susceptibility of any live biological controls to pesticides that might be available to coca or poppy producers. In sum, development of potential biological controls could require significant investments in research and field testing.

A form of biological control that has received attention is the use of mycoherbicides, which are naturally occurring fungi that infect and kill plants. In the 109th Congress, the Government Reform Subcommittee on Criminal Justice, Drugs and Human Resources approved an amendment to H.R. 2829, the Office of National Drug Control Policy Reauthorization Act of 2005, that authorizes a study on the health and environmental effects of mycoherbicides. The mycoherbicide *Fusarium oxysporum* (species *erythroxyli*, known as FoxyE) has received the most attention as a possible means of controlling drug crops. It was discovered on diseased coca plants in a research facility of the U.S. Department of Agriculture during the 1980s.[40] Some have advocated substitution of this fungus for glyphosate in aerial applications in Colombia, because, they argue, it is endemic to Andean countries, non-toxic to people and animals, does not attack non-target plants, and persists in the environment. However, other species of *fusarium* attack a wide range of plants and some fear that the coca-specific species might mutate.[41] The Colombian government has not approved its use.

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[39] "Alternative Coca Reduction Strategies in the Andean Region," Chapter 6, OTA-F-556, July 1993, at [http://www.wws.princeton.edu/ota/], visited October 27, 2005.

[40] For example, see the press release from the U.S. Embassy in Bogota. "Colombia y ONU tratan cooperación micoherbicida contra coca," at [http://bogota.usembassy.gov/wwwsfu00.shtml], visited October 27, 2005; and J.A. Gracia-Garza, D. R. Fravel, B. A. Bailey, and P. K. Hebbar, "Dispersal of Formulations of Fusarium oxysporum f. sp. erythroxyli and F. oxysporum f. sp. melonis by Ants," *American Phytopathological Society*, vol. 88, no. 3, pp. 185-189, 1998,
[http://www.apsnet.org/phyto/abstract/1998/pma98ab.htm], visited October 27, 2005.

[41] C.E. Swift, E.R. Wickliffe, and H.F. Schwartz, "Vegetative compatibility groups of fusarium oxysporum f. sp. cepae from onion in Colorado," *Plant Disease*, vol. 86, no. 6, pp. 606-610, 2002; David C. Sands and Alice L. Pilgeram, "Enhancing the Efficacy of Biocontrol Agents Against Weeds," in M. Vurro et al. (eds.) *Enhancing Biocontrol Agents and Handling Risks*, pp. 3-5, 2001; and Eric Fichtl, "Washington's New Weapon in the War on Drugs." *Colombian Journal Online*, 2000,
[http://www.colombiajournal.org/colombia21.htm], visited October 29, 2005.

Reliability of Drug Crop Estimates

Producing reliable estimates of illegal crop cultivation is difficult for several reasons relating to the methodologies used and the changing nature of cultivation. Several organizations monitor the cultivation levels of drug crops, often using different methodologies and producing different results. A 2003 Government Accountability Office (GAO) report examined the differences in methodology between the ONDCP and the State Department's Office of Aviation. In one area, the two organizations differed in the identification of drug crop fields by 79%. The discrepancy was largely based on differences in definition of what should be counted as a coca field. As a result, the report concluded that there are reliability problems with the both surveys. Neither had in place a statistically rigorous accuracy assessment, commonly known as an error rate, for their respective methodologies; and the technologies were insufficient for the purposes they were being used.[42]

The U.S. government data also often differs from that of the U.N. Office on Drugs and Crime (UNODC), which has consistently reported higher eradication rates. For example, the United States estimates that coca cultivation in Colombia decreased from 336,000 acres in 2000 to 282,000 in 2004, a 16% reduction. The United Nations reports that cultivation went from 403,000 acres to 198,000 in the same period, a 51% reduction. U.S. figures show that in 2004, Colombia cultivation remained stable, while UNODC reported a 7% decrease. Likewise, the United Nations reported increases in Bolivia (17%) and Peru (14%), while the United States reported decreases. ONDCP reports that estimates are made using survey-sampling techniques and satellite imagery, that it argues is similar to techniques used to estimate agricultural crops in the United States. The United Nations report interprets satellite images taken over a five month period, and verifies the results with aerial surveillance and on-the-ground observations. Margins of error can differ based on the resolution of satellite images, neglecting to include areas of new plantations, and missing areas where coca has been interspersed with licit crops. Opium poppy, grown in small plots and at high altitudes with nearly permanent cloud cover, are particularly difficult to survey.

The nature of cultivation is also changing as a result of eradication efforts. Growers are reducing the size of their crops and interspersing them among food crops in order to avoid detection. It is estimated that around half of Colombia's coca is grown on fields of less than 7.5 acres. Further, there is some evidence that farmers are increasing the density of plants per acre.[43]

Effectiveness and Sustainability of Aerial Eradication

Whether aerial eradication is an effective means to curb drug production has been a matter of intense debate. Even when eradication programs have been unable

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[42] Government Accountability Office, *Drug Control: Coca Cultivation and Eradication Estimates in Colombia*, GAO-03-319R, January 8, 2003.

[43] "Drugs in Latin America: What Kind of Turning Point?,"*Latin American Special Reports*, [http://www.latinnews.com], November 2003, and Pablo Bachelet and Steve Dudley, "Coca Crop Figures Raise Questions Over Drug War," *New York Times*, April 6, 2005.

to reduce cultivation, as occurred in 2004 in Colombia, officials argue that drug production has still decreased because newer crops, planted to replace eradicated ones, are less productive. According to the Office of National Drug Control Policy, the eradication program in Colombia has resulted in potential cocaine production decreasing by 7% in 2004 to 430 metric tons of pure cocaine. This is down from its peak of 700 metric tons in 2001. The same report indicated that potential cocaine production throughout the Andes has fallen 5% in 2004. Total regional cocaine production is estimated at 640 metric tons, dropping nearly 30% from its peak of 900 metric tons in 2001. Potential heroin production in 2004 decreased by 51%.[44]

Some observers caution that the propensity of farmers to replant coca and poppy is a troubling indication with regard to the sustainability of eradication programs, demonstrating that no lasting change in preferences is being achieved. John Walters, the head of ONDCP, stated in 2004 during a trip to Colombia that 85% of crops sprayed are replanted very quickly. The Environmental Protection Agency (EPA) reports that the herbicide glyphosate has no residual effect; plants that would be susceptible to glyphosate can be planted shortly after its application.[45] Other observers believe that decreases in cultivation in one area will result in increases in other areas. For example, successful eradication programs in the Putumayo region, the traditional coca growing area of Colombia, have been accompanied by increases in other regions. While both the ONDCP and the State Department report that a balloon effect — coca cultivation moving from one area to another as eradication proceeds — has not been observed across borders, there is evidence that some cultivation has moved across borders, although not yet in size that would indicate a large shift in cultivation patterns.[46]

In Bolivia and Peru, cultivation has been sensitive to changes in price. When prices have been depressed, growers have abandoned their crops. When prices increase, abandoned crops have been reactivated.[47] In Peru, the head of its antidrug agency reported that the price of coca leaf had increased from 80 cents per dry ton in 1980 to around $4 in 2005. Part of the price increase was attributed to the aerial eradication campaign in Colombia which had forced traffickers to turn to Peruvian suppliers.[48] The price, purity, and availability of cocaine and heroin have generally remained stable since 2000. However, the ONDCP reported in November 2005 that cocaine prices were beginning to show increases across the country. This

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[44] U.S. Office of National Drug Control Policy, "2004 Coca and Opium Poppy Estimates for Colombia and the Andes," March 25, 2005.

[45] "'Balloon Effect' is Boosting Coca Production in Peru, Bolivia, and Even Colombia," *Weekly Report*, at [http://www.latinnews.com], January 11, 2005, and U.S. Environmental Protection Agency, Office of Pesticide Programs Details of the Consultation for Department of State Use of Pesticide for Coca Eradication Program in Colombia, August 2002.

[46] "More Eradication to Counter 'Balloon Effect,'" *Daily Security and Strategic Review*, Latinnews.com, May 2005.

[47] "Drugs in Latin America: What Kind of Turning Point," *Special Report*, at [http://www.latinnews.com], November 2003.

[48] Ibid., *Weekly Report*, Latinnews.com, January 11, 2005, and *Security and Strategic Review*, at [http://www.latinnews.com], May 2005.

complements earlier data indicating a recent increase in heroin prices in some parts of the United States.[49] Some studies question the effect of eradication on drug prices. Even if increased eradication forced coca prices to double, the retail price of cocaine would likely be negligible. Since the mid-1990s, coca leaf prices in the Andes have increased, while the retail price of cocaine has not.[50] This may be due to the fact that coca leaf represents a very small fraction of the retail price. A 1994 study showed that coca leaf represents just 2% of the street price.[51]

Some Members of Congress have urged that the Colombian government take over the operation of the eradication program that is now provided by the United States. A 2003 GAO report found that neither the Colombian military nor the police are able to sustain the current program "without continued U.S. funding and contractor support for the foreseeable future."[52]

Eradication Challenges

Each country presents its own challenges to successful eradication. In Colombia, the armed conflict among illegally armed groups who profit from the drug trade and who control vast territory complicate eradication missions.[53] Other challenges there include difficulties with regard to the conduct of aerial eradication and criticism of the compensation system for accidental spraying of food crops. Peru and Bolivia face growing indigenous movements that are becoming formidable politically and are pushing for an end to eradication, and in some cases, for legalization of cultivation.

Spray Drift. Because Colombia allows aerial eradication of drug crops, there have been complaints about food crops, and even alternative development sites being sprayed. Supporters of the program contend that the targeted fields are identified with high precision, and the areas sprayed are electronically documented. Further, the spray drift is supposedly minimized by the use of large droplets, making the

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[49] Pablo Bachelet, "Plan Colombia Hampers Drug Trade; The Bush Administration Claimed that Higher Cocaine Prices Showed the Drug War is Being Won," *The Miami Herald*, November 18, 2005.

[50] Boyum, David and Peter Reuter, "An Analytic Assessment of U.S. Drug Policy," American Enterprise Institute for Public Policy Research, 2005.

[51] James Painter, *Bolivia and Coca: A Study in Dependency*, Boulder: Lynne Rienner Publishers, 1994. See also Kathryn Ledebur, "Bolivia: Clear Consequences," in *Drugs and Democracy in Latin America*, edited by Coletta A. Youngers and Eileen Rosin, Lynne Rienner Publishers, 2005.

[52] U.S. Government Accountability Office, *Specific Performance Measures and Long-Term Costs for U.S. Programs in Colombia Have Not Been Developed*, GAO-03-783, June 2003.

[53] It is estimated that up to 40% of the country is controlled to some degree by illegally armed groups. For more information, see CRS Report RL32774, *Plan Colombia: A Progress Report*; and CRS Report RL32250, *Colombia: Issues for Congress*, both by Connie Veillette.

likelihood of accidental spraying from drift less than 1% of the total area sprayed.[54] While the State Department reports that "occasional errors are unavoidable," it argues that every effort is made to minimize human and mechanical mistakes.[55] Spray missions are not to be conducted when wind speed at the airport is above 10 m.p.h., relative humidity is below 75%, and the temperature is more than 90 degrees. Spray planes fly at low altitudes, generally less than 100 feet, when releasing the herbicide. According to the Colombian government, the Colombian National Police does not spray regions that are identified as present or future alternative development recipients.

However, there are numerous reports of spray drift affecting licit crops and forestland. The Colombian Ombudsman's Office reported that the Indigenous Organizations of Putumayo (OZIP) complained spraying had taken place in the Nasa Chamb community in Puerto Asis, and that the area has no coca cultivation. The office also reported complaints from other parts of Putumayo in 2001 and 2002 that areas with corn, fruit trees, and grasslands had been sprayed. The Comptroller's Office reported in 2004 that forests near targeted areas had been damaged by spray drift, and Ecuador has complained that spray drift has affected crops across its border with Colombia.[56]

Compensation for Accidental Spraying. The U.S. Congress has included provisions in the annual foreign operations appropriations legislation[57] requiring the evaluation of complaints of harm to licit crops, or human health caused by aerial eradication, and for fair compensation to be paid for "meritorious" claims. Colombian law also provides for compensation in such cases. Complaints of potential harm to licit crops are investigated by the Colombian government, with nearly 50% of cases eliminated after verifying that the specific places during the dates reported were not fumigated. The remaining complaints are verified by field visits, where it is often found that licit crops were planted near drug crops. Under Colombian law, illicit crops that are interspersed with licit crops are legitimate objects of aerial fumigation.

According to the State Department's March 2005 *International Narcotics Control Strategy Report*, the Colombian National Police Antinarcotics Directorate (DIRAN), the agency responsible for aerial eradication operations, has received approximately 5,500 complaints of accidental food crop and/or pastureland spraying

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[54] Organization of American States, CICAD — Inter-American Commission on Drugs, *Environmental and Human Health Assessment of the Aerial Spray Program for Coca and Poppy Control in Colombia*, March 31, 2005.

[55] U.S. Department of State, *Chemicals Used for the Aerial Eradication of Illicit Coca in Colombia and Conditions of Application*, September 2002.

[56] "Ecuador: Fumigation Compensation Demanded," *Latinnews Daily*, July 19, 2005, "Ecuador: Talks with Colombia Over Fumigations Achieve Little," *Latinnews Daily*, September 1, 2005, and "Ecuador Concerned by Colombia's Herbicide Use," *Reuters*, September 19, 2005.

[57] These are currently set forth in P.L. 109-102, the FY2006 Foreign Operations Appropriations Act.

since 2001. Of these, 12 received compensation, resulting in about $30,000 in compensation. DIRAN reported that as of June 2004, those filing reports were residents of remote rural areas. Almost two-thirds were rejected because they were filed late, or because coca plantings were found next to food crops, while one-third were still under consideration. DIRAN also reported that peasants had filed complaints in no spray zones, that some complaints of damaged food crops had coca interspersed (and therefore subject to spraying under Colombian law), and that health complaints were due to other unrelated factors.

Critics argue that the few claims for restitution that have been accepted do not indicate the extent of the problem. They cite the "substantial security risks, time, and expense involved in farmers traveling to town and filing claims."[58] Colombia's Ombudsman's Office has indicated that the long distances, lack of roads and the security situation constrain the registration of complaints as well as their verification within specified deadlines. That office, and the Comptroller General's Office (CGO), has questioned the advisability of having DIRAN review compensation claims when they are also responsible for eradication.[59]

Social Effects. Public opposition to eradication has contributed to the growth in indigenous political movements in Peru and Bolivia. These movements have in some cases undermined the political will of national governments to aggressively eradicate, and have spurred movements to legalize cultivation. In Colombia, the larger conflict, in which drug trafficking is a component, has produced a large internally displaced population as people flee drug zones.

Public opposition has been most evident in Bolivia where eradication has met with protests from coca growers (*cocaleros*) who have organized themselves in legally recognized labor unions. Coca growers have also formed their own political party, the Movement toward Socialism (MAS). The MAS presidential candidate, Evo Morales, came in a close second in the last presidential election in 2002, and is a candidate in the upcoming election scheduled for December 18, 2005. The continuing protests in Bolivia, orchestrated largely by coca growing unions and their supporters, have contributed to the resignations of two presidents, and continuing instability. Interim president, Eduardo Rodriguez, has made a commitment to not increase the pace of eradication until a study is completed to determine the current level of traditional coca leaf use. Cocaleros have also protested the use of combined military and police units for eradication; conflicts with growers resulted in 33 deaths of growers, and 27 police and military fatalities between 1998 and 2003.[60]

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[58] Betsy Marsh, *Going to Extremes: The U.S.-Funded Aerial Eradication Program in Colombia*, Latin America Working Group, March 2004.

[59] Contraloria General de la Republica, "Plan Colombia: Quinto Informe de Evaluación," December 2004,and U.S. Department of State, *Memorandum of Justification Concerning the Secretary of State's 2005 Certification of Conditions Related to the Aerial Eradication of Illicit Coca and Opium Poppy in Colombia*, April 22, 2005.

[60] Kathryn Ledebur, "Bolivia: Clear Consequences," in *Drugs and Democracy in Latin America: The Impact of U.S. Policy*, Coletta A. Youngers and Eileen Rosin (Eds.) 2005.

In Peru, there has been a growing movement to de-criminalize cultivation, above the government-sanctioned legal limits. The region of Cuzco passed an ordinance in June of 2005 to allow legal coca cultivation. This ordinance was accepted by the national government on the grounds that it applied to areas where cultivation is already legal. The Cuzco ordinance prompted two other regions to follow suit — Puno and Huánaco — although the national government has stated that these ordinances are incompatible with national law. With President Toledo's low popularity and growing discontent in coca growing regions, some observers believe the government is unwilling to take on the increasingly assertive coca growers.[61]

In 2004, the Peruvian drug agency, National Commission for Development and Life Without Drugs (DEVIDA), released a study on traditional uses of coca leaf. It found that approximately 2 million Peruvians use coca leaf either habitually or occasionally, with another two million using it for tea, or for traditional or ceremonial purposes, demand that can be satisfied with about 9,000 metric tons. About 24,700 acres are needed to produce this amount, a slightly smaller land area than what is allowed under current law. The study may form the basis for new legislation limiting cultivation to that needed to supply the licit domestic demand.

In Colombia, the conflict among leftist guerrilla groups, rightist paramilitaries, and the government has resulted in large numbers of displaced persons. Drug crop areas are some of the most contested regions as groups fight for their control for income generation. Some of the displaced relocate to other parts of the country, while others cross the border into neighboring countries. The Colombian Human Rights and Displacement Consulting Office (CODHES) and the Ombudsman's Office believe there is a direct link between eradication and the increase in internally displaced persons (IDPs). The U.S. and Colombian position is that the drug trade itself and the armed conflict that it continues to fuel are the causes of displacement for those living in conflictive areas. According to the two governments, eradicating drug crops and removing the availability of its profits for illegally armed groups will result in the end produce peace and stability.

Effectiveness and Sustainability of Alternative Development

Congress has expressed interest in the effectiveness of alternative development programs to promote general economic development, their level of funding in relation to eradication programs, and their general ability to accomplish the objective of sustainability in reducing or eliminating drug crop cultivation. It is difficult to assess the success of AD with regard to promoting economic development because we do not know what poverty levels would be in the absence of alternative development assistance. Even in the presence of such programs, it is difficult to ascertain if they are helping to reduce poverty when there are so many variables that can inhibit economic development. Many observers believe that without a sustained alternative development program, eradication efforts will ultimately fail as farmers will replant drug crops as their only viable means to support themselves.

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[61] "Policy Clashes and Vacillation Threaten the 'War on Drugs' in the Andes," *Security and Strategic Review*, [http://www.latinnews.com], July 2005.

With regard to achieving counternarcotics goals, USAID maintains that alternative development is essential because it can foster political support for eradication programs and provide incentives that, coupled with the eradication disincentive, ensure the permanent eradication of illicit crops. Some observers, however, contend that the value of alternative development lies in its conjunction with "intelligent law enforcement, interdiction and community-based voluntary eradication," and that these three components are rarely adequately combined.[62] Other observers believe that AD alone does not reduce cultivation, particularly when it is not funded sufficiently or carried on for a long enough period of time.[63]

On the issue of sustainability, many foreign aid policy analysts believe that alternative development programs need to be comprehensive with a long-term commitment by sponsors. U.S. programs target a number of related problems, from infrastructure development to basic health and education. Proponents of AD believe that for results to be sustainable, programs must be oriented toward poverty reduction with a focus on generating both agricultural and non-agricultural income. Toward that end, they recommend including education, basic health care, land titling, and conflict management.[64]

Alternative Development Challenges

Challenges to AD programs in the Andes include the isolation of sites of production, poor transportation infrastructure, and the lack of access to marketing opportunities. Critics maintain that the United States too closely links the receipt of AD assistance on voluntary eradication, and puts more resources into eradication rather than alternative development. With regard to AD programs in Colombia, the Government Accountability Office reported that obstacles included difficulty in marketing products, poor soil conditions, security constraints, lack of territorial control that impedes the development of infrastructure, and lack of established markets and private sector investment. In addition, GAO mentions that individual projects reach a small group of families, are rather localized and small, and may not be sustainable. While the report's focus was Colombia, many of its conclusions may be applicable to Peru and Bolivia.[65]

Linking Eradication and AD. In Colombia, the United States considers aerial spraying a prerequisite for alternative development. For example, USAID

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[62] Coletta A. Youngers and Eileen Rosin (Eds.), 2005; and *Coca, Drugs and Social Protest in Bolivia and Peru*, Latin America Report No. 12, International Crisis Group, March 3, 2005.

[63] Ibid.

[64] James C. Jones, "An Overview of Alternative Development in the South American Andes," U.N. Office on Drugs and Crime, September 2004, and "The Role of Alternative Development in Drug Control and Development Cooperation," U.N. Development Program, International Conference, January 2002.

[65] U.S. Government Accountability Office, *U.S. Nonmilitary Assistance to Colombia Is Beginning to Show Intended Results, But Programs Are Not Readily Sustainable*, GAO-04-726, July 2004.

contends that growers in Putumayo showed little interest in participating in alternative development until after parts of the region were sprayed involuntarily at the end of 2000. This resulted in 37,000 families agreeing to sign up for voluntary eradication and alternative development support.[66] While the threat of forced eradication can act as an incentive to participate in alternative development programs, some observers argue that the two are contradictory, not complementary.[67] These observers believe that educating farmers on the negative impacts of illegal crop production is a more effective prevention tool. Some believe that coca farmers would prefer not to grow illicit crops because they understand the negative consequences for their communities — the social impact of coca production, a spiral of violence, and drug abuse — but feel compelled to do so in the absence of an alternative sustainable livelihood.

U.S. alternative development programs, however, require that growers eradicate all coca before being eligible for assistance. There have been complaints that AD has not kept pace with eradication, that it has been unable to provide adequate income for subsistence, and that poor soils and poor transportation infrastructure prevent getting agricultural or other income generating products to national markets. GAO has reported that USAID in Colombia is not sufficiently coordinating its efforts, with implementing partners cited as being unaware of each other's projects. The report concluded that successful continuation of projects requires better coordination between USAID and its contractors and grantees.[68]

In Bolivia's two main coca growing regions — Chapare and Yungas — growers have complained that they have not been able to benefit from alternatives to growing coca, citing a lack of coordination between existing community organizations and local governments, among other problems.[69] The Bolivian Law to Regulate Coca and Controlled Substances (Law 1008) authorizes forced eradication, but also requires simultaneous alternative development programs. Bolivia's 1998 *Plan Dignidad* stated that alternative development should accompany forced eradication.

Resources. Critics say that the resources devoted to alternative development programs are insufficient to provide a long-term alternative to illicit crops, and that the ratio between drug-related programs and development assistance is skewed toward the former. Since 2000, alternative development funding has been a little more than half that for eradication and interdiction programs. For Colombia, Peru, and Bolivia combined, spending on eradication has totaled about $3 billion, while

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[66] U.S. Government Accountability Office, *Drug Control: Efforts to Develop Alternatives to Cultivating Illicit Crops in Colombia Have Made Little Progress and Face Serious Obstacles*, GAO-02-29, February 2002.

[67] Testimony of Eduardo Cifuentes, Defensor del Pueblo, before the Colombian Congress, July 2001.

[68] U.S. Government Accountability Office, *U.S. Nonmilitary Assistance to Colombia Is Beginning to Show Intended Results, But Programs Are Not Readily Sustainable*, GAO-04-726, July 2004.

[69] Linda Farthing, "Rethinking Alternative Development in Bolivia," Andean Information Network and Washington Office on Latin America, February 2004.

total spending on alternative development is $1.6 billion. In Peru and Bolivia, the ratio between eradication and AD programs is approximately equal. In Colombia, eradication far outpaces AD programs. The cost of the aerial eradication program in Colombia may account for differences with Peru and Bolivia, where aerial spraying is not permitted. (See **Table 2**).

GAO reported in 2004 that funding constraints adversely affect nonmilitary assistance and complicate sustainability efforts. While USAID estimated in 2001 that a program for 136,600 families could cost up to $4 billion, the United States has allocated about $1.6 billion since 2000.[70] Both proponents and critics of AD programs believe that the continuation of financial and technical support is necessary for them to reach a sustainable momentum.

Appropriate Crop Substitution. Some observers have questioned the viability of crops recommended for alternative development programs. The head of Peru's antidrug agency, DEVIDA, has stated that crop substitution programs fail because the land is acidic and not conducive to other crops. The Peruvian agriculture minister also stated that programs to replace coca crops with alternative crops have been a failure, because the crops used, such as papayas and pineapples, are not profitable. While he proceeded to argue that AD would continue to be pursued, he recommended finding more profitable crops.[71] Similar complaints have been heard in Bolivia where some AD sites have been affected by falling global prices and a lack of assistance in exporting some commodities, such as hearts of palm and pineapples.

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[70] U.S. Government Accountability Office, *U.S. Nonmilitary Assistance to Colombia Is Beginning to Show Intended Results, But Programs Are Not Readily Sustainable,* GAO-04-726, July 2004.

[71] "Peru: Coca Replacement a Failure," *Latinnews Daily*, May 18, 2004.

Appendix A. Map of the Andean Region

Source: Map Resources. Adapted by CRS. (K.Yancey 10/13/05)