

Summary, Issues, and Congressional Policy Options | 1

For at least 80 years, control and abuse of imported narcotic substances, in general, have been public policy concerns. International treaties have been largely ineffective in controlling production and trafficking of illegal drugs. The human “search for the high” fuels demand, and supply control has been nearly impossible. Cocaine abuse and its social and economic consequences have followed this legacy and reached disturbing proportions in the last decade.

INTRODUCTION

Narcotics control strategies commonly are divided into demand- and supply-reduction programs. Although controversy exists over which of the two is the most critical, a comprehensive narcotics control strategy includes education, treatment and rehabilitation, development assistance, interdiction, and enforcement components (figure 1-1). No single approach will solve the international narcotics problem, yet the proper mix of supply-and demand-control programs has yet to be identified.

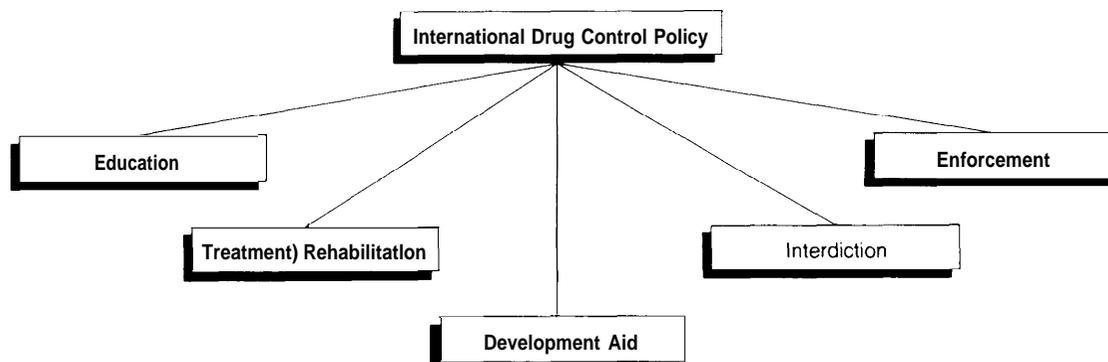
Although most coca currently is produced in the Andean region of Peru and Bolivia (87 percent) and Colombia (13 percent) (59), it also has been produced in other South American countries (e.g., Ecuador, Brazil) and Central America. If coca production is reduced in the Andean region, new production areas would likely arise as long as cocaine and its derivatives remain attractive narcotics. Nonetheless, supply reduction could have a valuable role in an overall narcotics control strategy. The temporary disruption of supply could increase street prices and reduce accessibility. The time investment to re-establish a production and cartel system is likely to be large and could have a debilitating effect on the overall industry (10).



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2 I Alternative Coca Reduction Strategies in the Andean Region

Figure I-I—Components of a Comprehensive International Drug Control Strategy



SOURCE: Office of Technology Assessment, 1993.

One potential strategy for reducing the flow of cocaine into the United States is to identify and support the development of alternative economic options for Andean producers of coca leaves and illegal coca-leaf products. This development-oriented strategy for supply reduction shows promise, but is unlikely to solve the cocaine problem without concomitant efforts in other areas such as drug law enforcement, interdiction, and education and rehabilitation of drug users.

Methods for coca eradication also are of interest in supply reduction strategies. Although eradication technologies focus on herbicide use, there is increasing interest in applying biological control methods to narcotic crop control. Some experts believe eradication must precede alternative development in the Andean nations. Others view coca eradication as futile and a threat to the culture and traditions of native Andean populations. Although key requirements, host country consent and cooperation currently are unlikely (57,58).

The economic, environmental, and sociocultural features of coca-producing countries profoundly influence supply reduction efforts. Developing suitable and effective approaches will require significant cooperative and coordinated effort among all concerned parties.

■ Cultural Context

Coca is a traditional Andean crop, with evidence of cultural significance dating from 2100 B.C. (11). Different coca-leaf varieties and associated chewing paraphernalia from succeeding centuries have been excavated in such varied areas as northern Chile and Costa Rica (40). Coca leaves are a critical element in the traditional Andean patterns of production and exchange between highlands and lowlands. Community and political solidarity were long maintained through these exchanges.

Chewing coca leaves has been practiced for thousands of years in the Andes and is still a pervasive cultural activity. Coca leaves are used to relieve fatigue, hunger, and a variety of human ailments (e.g., 87 percent of Bolivia's small town and rural population use coca leaf for health reasons (28)). Coca leaves figure symbolically in cultural and religious rituals and are an integral part of many daily social routines.

Today, transformation of this resource into a high-profit cash crop and its resulting steep price constitute a cultural threat and personal hardship for many indigenous Andeans. This situation may be exacerbated if coca eradication or substitution programs further restrict the availability of coca leaf for traditional use. Coca reduction efforts, thus, will involve providing for traditional needs, while precluding illegal use (43).

The Andean nations are increasingly concerned over the adverse impacts of cocaine on their societies. *Pasta básica*—an intermediate product of cocaine processing—generates effects similar to “crack” and consumption increases have been noted in some Andean countries. Further, *pasta básica* contains significant impurities (e.g., lead, sulfuric acid, kerosene) compounding adverse effects on users. In 1987, Colombia’s Health Ministry estimated that 2 percent of the population were regular users and a United Nations report estimated Colombia may have one of the world’s worst drug problems (14). Recent surveys indicate similar figures may apply to Bolivia. Within this heightened awareness of the adverse effects of illegal narcotics, alternative development may find greater acceptance.

■ Environmental Context

The Andean region is complex in terms of its geology, ecology, and cultural history. This complexity precludes simple or broadly applicable coca substitution or eradication approaches. The natural environmental diversity results largely from abrupt altitudinal changes common in the Andes. The region consists of a vertical succession of ecozones, ranging from rainforest and desert at the lowest levels to mountain tundra, snow, and ice at the highest. The Andes enormous latitudinal and longitudinal range also makes for considerable variations in climate, soil, vegetation, and land use (1).

The primary zones of illegal coca cultivation include the Chapare in Bolivia, the Alto Huallaga in Peru, and a variety of areas around the Cauca Valley in Colombia (figure 1-2). These areas are characterized by high rainfall, acidic soils, and altitudes ranging between 200 and 1,500 meters above sea level (masl). Many of these areas are inappropriate for agriculture, much less for characteristic coca cultivation (22). There are a number of environmental concerns arising from coca production: deforestation to establish coca fields, soil erosion and associated fertility losses,



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Steep topography characteristic of the Andes gives rise to significant climatic variations over short distances.

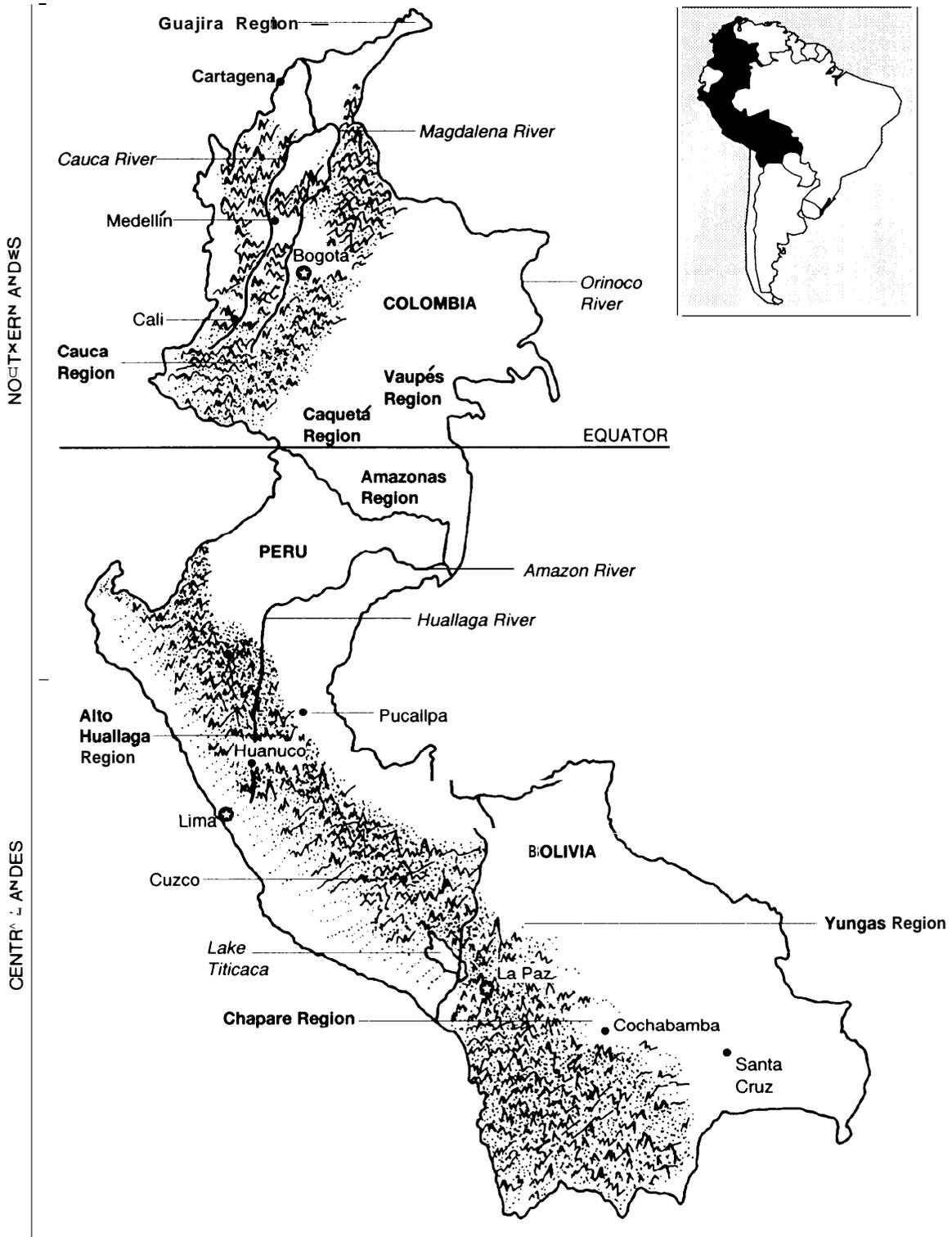
heavy pesticide use, and subsequent movement of these chemicals to soil and surface and groundwater resources (3,22,29).

Chemical wastes from cocaine processing (e.g., kerosene, sulfuric acid, lime, calcium carbide, acetone, toluene, ethyl ether, and hydrochloric acid) also may impair terrestrial and riverine systems. These wastes can increase water pH, reduce oxygen availability, and lead to acute and chronic poisoning of fish (e.g., liver, heart, kidney, and brain lesions, and possible genetic mutations). An estimated 150 Peruvian streams and rivers have pollution levels exceeding the safety standards set by the World Health Organization (32).

Proposals for coca eradication using herbicides have been criticized for environmental reasons. Environmental reviews elaborating the potential environmental effects of chemicals have been prepared for specific herbicides identified as effective at eradicating coca species. However, the process has been less rigorous than that required for domestic activities under the National Environment Policy Act (NEPA). Substantial Peruvian opposition to the use of herbicides in the Amazon Basin resulted in cessation of U. S.-sponsored herbicide testing and data gathering in Peru (45). As a result, a complete analysis of the

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Figure I-2—Primary Coca-Producing Zones in Bolivia, Peru, and Colombia



SOURCE: Office of Technology Assessment, 1993.

potential impacts of herbicide use on future land and aquatic productivity is not available.

Biological control (biocontrol) has been identified as an alternative to chemical control of coca. The United Nations International Drug Control Programme identified biocontrol as a possible eradication method for narcotic crops nearly a decade ago, and interest continues in investigating the potential for this technology to control a variety of narcotic crops (54). Biocontrol relies on the use of biological agents to prey on an identified target and reduce its prevalence in the treatment area. However, some disagree about the potential for biocontrol techniques to achieve eradication. Biocontrol may provide an environmentally benign way to reduce coca cultivation, yet there are considerable social and political constraints to its implementation.

■ Social, Political, and Economic Context

Long-term social inequities and political and economic unrest contribute to coca's dominant role in the economies of Bolivia and Peru, the world's leading producers of coca leaf. Colombia, where a large cocaine trafficking industry has emerged, also exhibits extreme social and political instability. It is in this unsettled milieu that coca-dominated economies have flowered. However, each country has a unique set of contributing circumstances.

The cocaine economy—including production, processing, and transport—is extensive in Bolivia, Peru, and Colombia. The continuum from coca production to cocaine marketing involves different actors, with different values; their commonality is that each finds coca a ready cash source (35). Individuals deriving the greatest economic benefits from coca production (i.e., narcotics traffickers) have gained political power through a variety of mechanisms (e.g., bribery, land acquisition, farmer/cattlemen associations, assassinations) (14). The strong presence of numerous insurgency and terrorist groups compounds the difficulties Peruvian and Colombian

national governments face in drug crop control efforts. As one analyst suggests:

...[the U.S. is] asking a country [Peru] that's fighting the Civil War and going through the Great Depression at the same time to suddenly take on Prohibition as well (4).

BOLIVIA

The progressive impoverishment of Bolivia's rural upland population, dating from the colonial period, was accelerated in the 1980s by severe drought and by agricultural and trade policies unfavorable to subsistence farmers. Many peasants were forced to migrate to other areas, including the Chapare—a center for coca cultivation. This influx of labor, and a general economic decline, affecting even middle-class Bolivians, helped spur a surge in coca-leaf production and processing as the only economic alternative for many financially-desperate Bolivians.

However, estimates of the population involved in the coca trade vary widely. For example, 20 percent of the Bolivian workforce was estimated to be involved in the coca economy in the late 1980s (24) whereas a 1990 report estimates only 7 percent (19). Nevertheless, the Bolivian coca economy annually generates as much foreign exchange (roughly U.S. \$600 million) as all other exports combined (5).

Social and political inequities persist in Bolivia, such that peasant populations have meager educational and development opportunities, while an agrarian elite wields considerable political power and monopolizes the country's financial resources. This situation seriously constrains possibilities for the country's broad-based socio-economic development (27,30).

Although Bolivia operates under a democratically elected civilian rule, and is somewhat more stable politically than Peru or Colombia, the political situation is tenuous. Many national institutions, including judicial and law enforcement agencies, are weak, and the government has not been able to lift the majority of Bolivians out of poverty.

PERU

Recent peasant migrations from the Peruvian highlands to the coca-growing Alto Huallaga is the latest chapter in a long history of economically-induced migrations. Land shortages and/or lack of work in the highlands, as well as rapid population growth (beginning in the 1940s), have fueled the latest population movements into the eastern valley systems.

Coca cultivation has expanded in the Alto Huallaga, in part as a result of these migrations and in part due to the country's failing economy and severe international debt crisis. Coca production expanded considerably as economic conditions worsened in the late 1980s, softening the most profound economic and employment crisis in the republic's history. The coca economy continues to increase proportionally to the decline of the nation's legal economy (31).

Attempts at economic reform by the Fujimori Administration are undermined by pervasive political unrest, poverty, and an uncertain business environment. Alberto Fujimori ended 12 years of democratic rule in Peru when, supported by the army and police, he seized political power in a "pseudo-coup" (23). Peru's current state of extreme economic and political instability constitutes a domestic crisis that overshadows the importance of counternarcotic efforts in the minds of most Peruvians. Moreover, strong guerrilla movements in Peru's coca-producing areas make any counternarcotics initiatives extremely hazardous. In recent years, 10 workers for the U.S. Agency for International Development (AID) have been killed here (34).

COLOMBIA

Coca production has not been as widespread in Colombia as in Peru and Bolivia. Coca production, banned in 1947 after lengthy public debate, has re-emerged, however, paralleling the development of a large and lucrative criminal-run cocaine manufacturing industry, with exports netting close to U.S. \$3 billion a year. The illegal drug industry has flourished in Colombia in part

because State presence traditionally has been weak; guerrilla movements are strong, and political "clientelism" rampant, with increasing concentration of land, capital, and credit in the hands of an elite minority. As the gap between rich and poor has widened, so has that between written law and the economic behavior of the underground cocaine economy. Drug-related violence and corruption have undermined the country's courts, and police and customs service, as well as the military (8).

Colombia has enjoyed positive economic growth overall in the past four decades, but drug money now spreads corruption throughout the country's economy. Real estate and construction have been particularly heavily infiltrated by narcotics investors, who have had technologically modernizing but socially regressive impacts. For example, although they have introduced and financed new technologies for increasing economic productivity, they have also established paramilitary groups, discouraged peasant participation in the political process, concentrated land ownership, and laundered capital in investments with fast turnover rather than higher long-term yields (51).

Colombia's growth record was much better in the pre-cocaine era than it has been in the post-cocaine era. The trend today is toward declining economic productivity and reduced growth. Domestic drug violence and terrorism further undermine the country politically and economically. Today, Colombia is one of the most violent countries in the hemisphere. Strengthening and redefining the role of the State in Colombian society is central to the success of any drug-control policy.

■ Development Assistance and Coca Reduction

Development assistance seeks to create and extend alternative livelihoods, build local institutions, provide education and training, promote infrastructure improvements, and provide social

services. The development goal in coca substitution programs is to assist countries dependent on a black-market economy to move toward legitimate markets. In the coca-producing countries, the focus largely has been on developing alternative agricultural systems incorporating high-value or multipurpose crops. However, existing national agricultural policies do not favor smallholders—those most commonly involved in coca production.¹ Fiscal realities result in focusing resources on areas of high population density. Conversely, coca-producing regions tend to be remote and sparsely populated and, within this environment, few opportunities exist for smallholders to be profitable in the legitimate agricultural market (2,27,34).

Early U.S. coca substitution efforts focused on producing regions in the Andean countries (i.e., Alto Huallaga in Peru, Chapare in Bolivia). Initial substitution efforts in Bolivia concentrated solely on farmers in the Chapare region through the Agricultural Development in the Coca Zones Project (ADCZP) and later under the Chapare Regional Development Project (CRDP). However, it became apparent the combination of an easily produced crop, stable market and marketing channels, and an abundant labor supply as a result of population migration were all fundamental to the increase of Chapare coca production. Thus, the CRDP was redesigned to include development in emigration zones through the Associated High Valleys component. This effort has been expanded further to encompass integrated regional development under the Cochabamba Regional Development Project (CORDEP) (figure 1-3). Similarly broad development efforts are likely to be needed in other coca-producing areas as well.

Numerous national and international organizations have been actively involved in coca substitution projects in South America. Their activities include basic and applied research on potential



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Small, remote landholdings characterize many coca-growing areas. Production units often are less than 2 hectares in size, such as this minifundia.

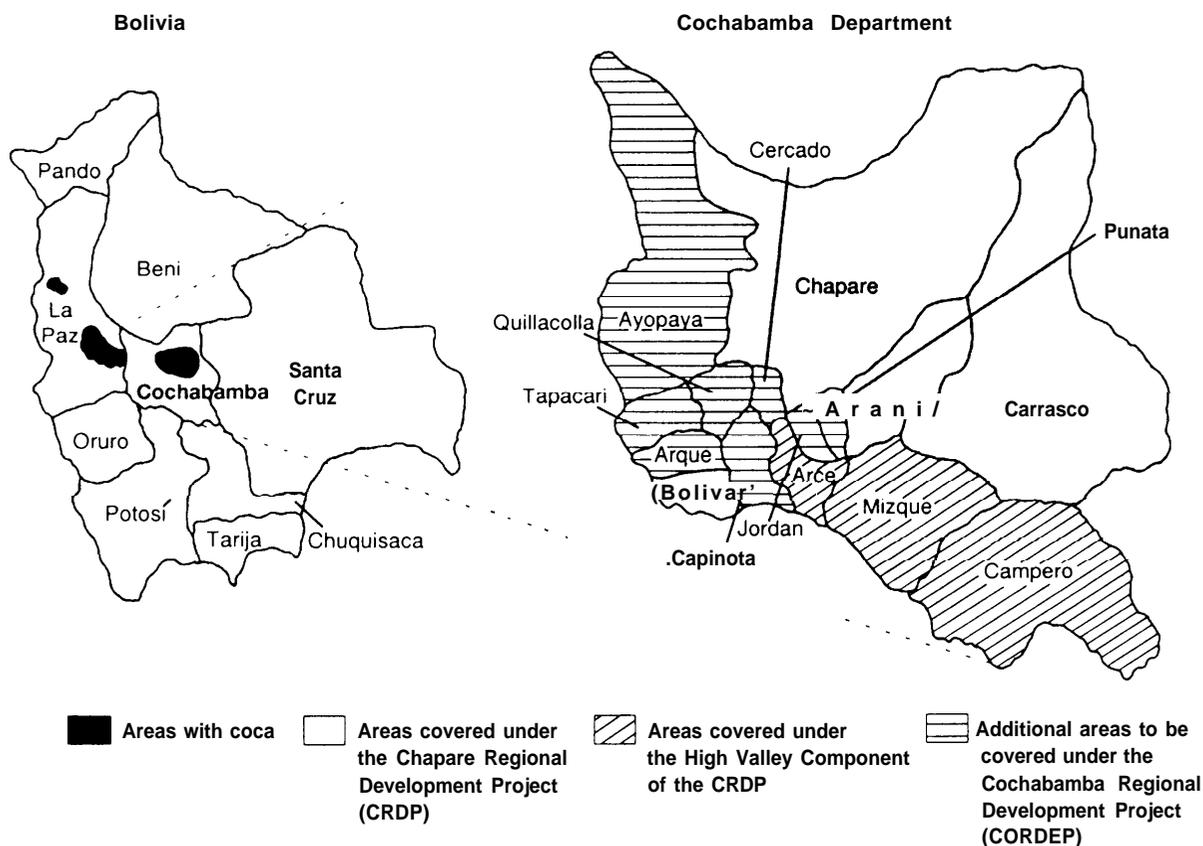
alternative crops, demonstration and extension of promising technologies to farmers, agroprocessing, and infrastructure development. Crop substitution approaches sponsored through the United Nations International Drug Control Programme are built on the concept of rural development that complements substitution efforts. While crop diversification alone may provide greater security for farmers compared with drug-crop monoculture, the transition to legal crops also requires concerted efforts in development of production practices, infrastructure, and markets (36).

The economics of coca is often seen as the primary constraint to widespread adoption of alternative crops. Coca profits are nearly twice that of identified high-value crops (e.g., peach palm) and at least four times greater than other traditional crops such as pineapple or citrus (61). However, declining prices at the producer level suggest coca may no longer be the most lucrative crop (18). Furthermore, such comparisons may be meaningless: the nature of coca production defies traditional methods of estimating profitability

¹ There are exceptions to this statement, most notably the long-range Colombian coffee policy designed to stabilize the national production system in light of the effects of the international market on prices and thus on producer earnings (18).

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Figure 1-3-Evolution of the Cochabamba Regional Development Project (CORDEP)



SOURCE: Office of Technology Assessment adapted from Development Alternatives, Inc., *Cochabamba Regional Development Project (CORDEP)-Bolivia*, technical proposal (Bethesda, MD: DAI, 1992).

because of its dependence on unpaid family labor (38).

A combination of legitimate crops suitable to the environmental and sociocultural features of the production region, market assurance, access to affordable credit, and a suite of social/human services (e.g., rural justice, school systems, health care) could be sufficient incentives for coca producers to adopt alternative systems (box 1-A). Removal of U.S. trade barriers for certain South American exports, for example, could promote crop substitution and development of value-added industry (9.3). To some extent, this has been accomplished under the recent Andean Trade Initiative (ATI). Revision of import quotas

on certain commodities and tariff reductions on value-added products could complement the goal of the ATI.

In the past few years, crop substitution has become a subset of alternative development in the Andean countries as attention to industrial and marketing aspects has increased. Nevertheless, the focus remains on agriculture and related industries. The alternative development problem is complex, requiring attention to numerous variables, and not adequately addressed by any single approach. Long-term programs are needed that provide a range of options for potential participants.

Box I-A=High-Value Legal Alternatives to Coca: **Sericulture** in Colombia

The economics of coca **production** has been **perhaps** the single most **widely** articulated obstacle to successful crop substitution efforts. However, some disagree over the need for a **dollar-for-dollar** equivalent to coca or if an integrated alternative development package based on legitimate **crops, development of production** and marketing infrastructure, and **social** service amenities is sufficient. However, combining a high-value, **low-volume** crop with dear market potential into an integrated development package may offer the greatest benefits.

Sericulture (silk production) in **Colombia** **grew** in 1970 as part of a **diversification** program sponsored by the Colombian Coffee **Growers** Federation (**FEDERCAFE**). By 1987, **silk** production was in progress in the Departments of **Caldas, Risaralda, Valle, and Cauca**, with a **total** production area of 124 hectares. A **pilot** plant was established in **Timbio (Cauca)** to process **high-quality** -ns into export products, however, the plant subsequently closed due to technical difficulties (15).

The Colombian **sericulture** activities have been sponsored through a blend of national and international funding sources, **primarily the** Colombian Government and private sources and Korean investors. Currently, five **silk-producing** ventures exist in Colombia (i.e., COSEDA and **COKOSILK**, joint ventures between Colombia and Korea; **COSILK**, 100-percent Korean investment; and **CAPULLOS** and **PROSEDA**, 100-percent Colombian investment). The Colombian Government promotes **sericulture** by **financing all** technical assistance and providing credit opportunities at 28 percent interest. In addition, credit is **available** through **FEDERCAFE** and the Export Promotion Fund (**PROEXPO**) at 18 and 32 percent **interest**, respectively (15). The availability of **sericulture** technologies, **technical** assistance, credit, and markets suggests **silk** production **could** become an attractive alternative crop for some areas (15, 41).

A **project** currently underway in Colombia's **Cauca** Department is attempting to promote **sericulture** as an alternative to coca production for nearly 300 farm **families** in two **small** towns (Pan de **Azucar** and Santa **Cruz**). The **project—Silk for Life** is sponsored by the Wisconsin Farmers Foundation, inc. and works with **local** farmers and **silk** weaving **groups** and a weaving cooperative in **Milwaukee**, Wisconsin. The project site is characterized by **small** farms (about 8 hectares) and a **lack** of transportation and electrification systems. For at **least** a decade, coca has been incorporated in farmer's **production** schemes as a cash source. Nevertheless, today 40 **pilot silk** farms are operating under the **Silk for Life project** (16).

The **project** approach is based on basic **rural** economic development with goals of reducing coca production in the region and reviving the associated **rural** communities. The **Silk for Life** project offers a blend of **technical** assistance, **credit**, and marketing opportunities to support the producers:

- **Training—Two model** farms exist in the **area**, one in **Timbio** and one in Santa **Cruz**, to demonstrate **sericulture** techniques for **potential** adopters.
- Technology-Technical assistance is offered in basic **sericulture techniques**, energy systems, and organic farming.
- **Marketing—Central** marketing is organized for **locally-produced** cocoons.
- **Credit—Materials** for **sericulture** startup are **available through** the project on a 'barter' basis whereby the borrower repays the loan with cocoons after production has begun.

In addition to focusing on an economically attractive crop, this project has blended a variety of additional features into a **single** package to promote **sericulture** in Pan de **Azucar** and Santa **Cruz, Cauca**. The package includes generating support from **local** community **leaders** and incorporating community development features (e.g., electrification, transportation) that may have benefits beyond **sericulture** (16).

SOURCE: Office of Technology Assessment, 1993.

Opportunities exist to promote alternative development in the Andean region. Many of these are technically based, as in developing sustainable forestry practices suitable to current coca production regions. However, broad opportunities also exist for influencing the viability of coca reduction efforts more generally. These overarching issues include creating national incentives for participation in alternative development, gathering and making available information needed to support alternative development, coordinating donor activities, and pursuing integrated national development.

CREATING NATIONAL INCENTIVES FOR COCA REDUCTION

Technical feasibility alone will not guarantee success for coca reduction efforts. The political will of Andean nations is critical, as is the acceptance and support of Andean peoples. The Andean nations (Bolivia, Peru, and Colombia) operate with differing political agendas, and driving social, cultural, and economic forces. Also complicating substitution efforts is the fact that coca cultivation has enormous cultural and economic significance for Andeans. The chewing of coca leaves for social, medicinal, and religious/spiritual purposes is an important and long-standing tradition that may inhibit acceptance of coca substitution programs.

Existing economic conditions in the Andean countries profoundly influence national ability to undertake coca reduction programs, including crop substitution and eradication components. Coca production contributes heavily to the national economies—in most cases comprising the greatest share of export income. Developing mechanisms to improve national economies could contribute to greater ability to enter into coca reduction programs. Such an effort is likely to require short-term economic relief and long-term economic development (58).

Another constraint to reduction efforts is the lack of governmental presence in rural areas,



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Coca retains its cultural and social significance for many Andeans today. Here, coca leaf (hoja de coca) is being prepared for transport to legitimate markets to be sold for traditional use.

including provision of basic human services, rural justice, and other needed institutions. Local governments with leaders elected directly and held accountable by rural constituents could increase rural participation in the political process. Such efforts could reduce the environment where insurgency and lawlessness flourish.

Local grassroots organizations have played a large role in rural politics, particularly in Bolivia where local *unions--sindicatos* have provided a means for rural inhabitants to voice their concerns and desires to a centralist national government. Nevertheless, assistance activities often do not make use of these local avenues of leadership and community cooperation. Acceptance of programs to reduce coca production could be enhanced through efforts to incorporate local groups in planning and implementation (27).

Support for U.S.-bilateral efforts in the Andean region is poor. Many Andeans perceive U.S. activities as heavy-handed attempts to solve our domestic narcotics problem on foreign soil. A key concern is that without commensurate demand reduction efforts, supply reduction merely increases costs to the Andean countries. Yet, U.S.

Table I-1—Federal Drug Control Budget Authority
(billions of dollars)

	Supply	Demand	Percent demand of total
1981	\$ 800	\$ 350	30 %
1983.	1,250	350	22.6
1985	1,700	400	19
1987. , ... , ...	2,900	900	24
1989	4,000	1,600	29

SOURCE: M. Collett, "The Cocaine Connection: Drug Trafficking and Inter-American Relations," *Headline Series, Foreign Policy Association*, No. 290, Fall, 1989.

Federal expenditures focus on supply reduction (table I-1). Analysts suggest that under these circumstances, multilateral activities are more likely to be publicly acceptable. In addition, public outreach and education efforts and greater coordination and cooperation with host countries could support these activities (57,58).

Issue: Lack of economic incentives at the national level hinders active participation in coca reduction programs.

The ability to carry out programs is inextricably linked to economic conditions. Some poorly paid public officials can be bribed to ignore illegal activities, poorly supported research and extension systems are unable to provide high-quality technical assistance to producers, and scarce alternative employment opportunities lead to participation in the coca trade. The level of bilateral debt owed by the Andean countries to the United States alone is significant and far outstrips their annual gross national products (GNPs) (table 1-2). Debt servicing hinders national government investment in needed development activities.

Generating political will to undertake coca reduction might be enhanced by providing general economic incentives to national governments. The current political and economic conditions of the Andean countries significantly reduce the ability of national governments to undertake coca reduction programs. Yet, without national commitment to improving opportunities for rural communities in general, and coca farmers specifi-

cally, potential for effective alternative development programs is greatly reduced (57,58).

Option: Congress could create "debt-for-drugs" swap opportunities for the Andean countries.

Providing bilateral debt relief in exchange for coca reduction achievements—"debt-for-drugs" swaps—has been suggested as an opportunity for improving supply reduction efforts, yet specific legislative action has not been taken. Examples of successful debt swaps suggest similar actions could be useful for coca reduction. The United States recently eliminated \$371 million of Bolivian debt under the Enterprise for the Americas Initiative (EAI) (25). The EAI debt reduction component could serve as a model to develop "debt-for-drugs" swaps. National policy actions promoting preconditions for successful alternative development could serve as "collateral" for debt relief.

Conversely, if lessons from related activities involving national economic incentives are reviewed, possibilities for dramatic results from a "debt-for-drugs" program may seem less likely. For example, certification for U.S. development assistance funding has been used as a mechanism to motivate compliance with coca reduction goals and although it has elicited short-term reduction efforts, it has yielded little in overall supply reduction. Nevertheless, debt relief could provide a double service by increasing political will to undertake supply reduction and improving the fiscal ability of national governments to finance needed national projects.

Issue: Andean eligibility for U.S. development assistance is closely linked to coca reduction.

Eligibility for development aid is in part based on narcotics reduction achievements. Thus, at the national government level, the development goal may become secondary to a counternarcotics agenda-i. e., success may be measured by hectares of coca reduced rather than hectares of legitimate crops produced. Further complicating

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Table 1-2—Andean Bilateral Debt With the United States
(In millions of dollars, as of 9/30/90)

	GNP	Debt:GNP ratio	AID	PL-480	CCC	EXIM	Total
Bolivia	\$ 46.0	11:1	\$ 331	\$141	\$ 0	\$33	\$ 505
Colombia	354.0	3:1	499	2	0	497	998
Peru	189.0	4:1	318	221	95	54	688
Totals			1,149	364	95	584	2,191

AID—U.S. Agency for International Development

PL-480—Agricultural Trade Development and Assistance Act of 1954 as Amended, “Food aid”

CCC—Commodity Credit Corporation

EXIM—Export-Import Bank

SOURCE: U.S. Department of the Treasury, “Enterprise for the Americas Fact Sheet,” Washington, DC, September 30, 1990.

this situation is the reliance on narcotics data of questionable accuracy to support reduction claims.

Option: Congress could refocus certification requirements for development funding to include specific development objectives in addition to satisfying “coca clauses.”

The basis of alternative development is to assist recipient nations to enter the international legitimate economy. Preconditions for achieving this goal have been identified and are part of many donor activities. However, some conditions can only partly be fulfilled by donors and require the firm commitment of host countries. For example, increasing local government presence, promoting rural justice, and providing social services for rural populations will depend largely on national government efforts, yet are critical for improving development opportunities. Refocusing assistance certification criteria on the achievement of these development goals could increase interest on the part of the host country.

However, placing additional burdens on national governments to achieve development goals to qualify for U.S. assistance might be unrealistic given economic and political conditions in the Andean region. Conversely, certification could highlight development objectives to the exclusion of coca reduction. Such an act is likely to require a significant increase in U.S. domestic enforcement, interdiction, and education to prevent increased narcotics abuse in the short term.

Issue: Lack of rural governmental presence hinders adoption of coca reduction programs.

Government presence generally is weak in rural Peru, Bolivia, and Colombia. National governments could choose to address this condition through policies that establish effective local governments and state control within the framework of the legitimate judicial system. An improved judicial system could facilitate development activities and offer increased human rights protection.

Rural government presence encompasses accountability to local political authorities by police and security forces, legitimizes support of the democratic process, and strengthens the judicial system. Administration of rural justice and control of national territory are critical for implementing development programs and development of popular support for substitution efforts. Common development assistance goals—institution building, providing social services, and improving standards of living—may contribute to increasing security in rural areas.

The U.S. Department of Justice and AID offer assistance to judicial institutions in the Andean countries through several programs intended to improve the administration, operation, and effectiveness of the country’s judicial system. However, this assistance is a small part of the overall assistance budget.

Option: Congress could direct AID to increase its support to judicial institutions in the Andean nations through Justice Sector and Strengthening Democracy projects.

Greater presence of rural justice in current coca-producing areas could yield benefits in increasing stability by assuring those breaking laws would be properly adjudicated in an established legal system. AID justice-sector programs have been implemented since the mid- to late 1980s in Bolivia and Peru.

Achieving increased rural justice in the current social and political climates of the Andean region is likely to be difficult. A concerted effort is likely to require additional fiscal resources, and in areas where violence is significant, security needs would be paramount. Increasing military and police presence in some areas may not be perceived as a benefit at a time when militarization components of the “drug war” are unpopular.

Alternative Option: Congress could direct AID to increase the level of coordination/cooperation with local grassroots organizations.

Local community groups have and continue to play an important role in Andean rural politics. Grassroots organizations typically have strong support from local populations and understand local cultures, aspirations, and priorities. Groups such as the Bolivian *sindicatos* provide a mobilizing force for rural change and expression of concerns to the national governments.

Incorporating existing community groups and other grassroots organizations in planning and implementing alternative development programs could yield benefits in adoption rates. Bolivian crop substitution programs might work cooperatively with *sindicatos* to promote peaceful crop substitution and alternative development efforts. Such cooperative efforts would ensure local concerns were identified in project planning and encourage local understanding of the project process.



Coca farmers receive the lowest percentage of profit in the cocaine industry—perhaps as little as 1 percent. Here, a coca farmer in the Chapare is spreading the harvested leaves to dry them in preparation for sale.

However, diverse political parties may influence grassroots organization activities, and political conflicts between the state and these organizations may create difficulties for the organizations as development vectors. These features should be considered in project planning and approaches to deal with them identified to reduce any potential adverse impact on project effectiveness.

INFORMATION NEEDED TO SUPPORT ALTERNATIVE DEVELOPMENT PROJECTS

Setting realistic goals for coca reduction programs will depend, in part, on availability and accuracy of basic information on coca farmers and others linked to the cocaine economy. Identification of key targets for alternative development activities will be integral to increased effectiveness of U.S. development assistance. Several initial questions need to be addressed: What is the current and potential areal extent of coca production? Who and where are the populations economically linked to production? What are the appropriate levels of development (e.g., subsistence, semi-commercial, commercial) for these areas and populations? Additional decisions might further refine target groups (e.g., identifying what

economic population should receive priority—poorest, borderline, or entrepreneurial). Information needed to support alternative development/coca reduction programs includes:

- Extent of the coca economy (including direct and indirect participants),
- Comparison of coca and alternatives, and
- Centralized and easily accessed source of information related to ongoing activities.

Issue: Inadequate information on the true extent of the coca economy hinders development of programs to reduce dependence.

Studies of the extent of the coca/cocaine economy are lacking and likely to be difficult to conduct. While estimates of the relative size and importance of coca to national economies exists, little information is available that identifies the subsectors dependent on coca/cocaine production, nor their level of dependence. Yet, such information could provide insights for development projects and improve opportunities for integrated development.

Collecting information that accurately identifies populations involved directly in coca production (through production, labor, transport), including the extent of dependence (i.e., part-time, seasonal, full-time), and survival strategies during low coca prices, is likely to be difficult. Existing information sources might provide an alternative to new information-gathering activities. Information on coca farmers in the Chapare exists through the Cooperative Agreement on Human Settlements and Natural Research System Analysis (SARSA). Although somewhat dated, similar information exists for farmers in the Alto Huallaga. This resource could be reviewed and evaluated within the context of improving identification of target populations for alternative development programs.

Option: Congress could direct the U.S. Department of State, Bureau of International Narcotics Matters, and AID, cooperatively, to develop comprehensive coca industry profiles that

identify populations and economic sectors directly and indirectly linked to coca production and their relative level of dependence and use this information to direct development projects to high priority targets.

Profiles could be developed using existing information gathered through activities of both agencies. AID and its contractors have accumulated a wide array of information on coca producers and farm laborers. The U.S. Department of State has focused more on those involved in the additional aspects of transport, processing, providing precursor chemicals, etc. This information could be pulled together to create a comprehensive profile of the breadth of the coca economy and provide an outline of key populations/sectors that ultimately will be affected by coca reduction programs. Such an outline could provide an agenda for future international development planning as well as a resource for a national development strategy.

Additional funding could be made available to allow profile development without adding the burden on agency staff. In addition, some activities and populations may be more transient than can be incorporated readily into such analysis. The segments of the coca trade that are likely to be excluded or insufficiently described also could be identified in the overall effort. Mechanisms to assure the profile information is used in future project planning also would be needed.

Issue: Lack of accurate economic studies comparing coca with other potential alternatives hinder efforts to promote adoption of renewable resource-based alternatives to coca.

Coca is a traditional Andean crop, relatively easy to produce and sell, and provides a good return on investment. Although coca prices fluctuate, traditional economic analyses suggest they are high relative to legitimate agricultural commodities that are more visibly affected by global markets. These conditions make identifying and promoting alternative crops difficult.

Although alternative crops, products, and activities exist, information on the market potential of many of them is lacking. However, such information could facilitate identifying priorities for alternative development efforts. Additionally, economic analyses of other alternatives such as forest products, wildlife, and fisheries as compared with coca and alternative crops could be used to identify additional opportunities for specific regions.

Option: Congress could direct AID, cooperatively with the U.S. Department of Agriculture, Economic Research Service, to undertake economic studies of renewable resource-based alternatives environmentally suitable to coca-producing areas that have not been evaluated economically to date.

Alternatives to be evaluated economically (e.g., agroforestry, forestry, extractive reserves, alternative crop plants, animals, etc.) could be identified by AID, along with regional characterizations describing existing production opportunities and constraints. For example, if tropical hardwood production provides an environmentally suitable and high-value opportunity in certain regions, but is constrained by lack of processing or harvest mechanisms, these features could then become development priorities.

Studies would be prepared and filed with AID's Office of Evaluation, Center for Development Information and Evaluation (CDIE) and available to prioritize activities in the Andean region. The information could be made freely available to international development assistance groups and used to promote adoption and assist in developing appropriate incentives for adopters.

However, the fluctuation of global markets may complicate such analyses. Thus, opportunities and analyses may only be accurate for short periods, making rapid turnaround a high priority. Additional pressures on staff time could result in reduced attention to ongoing priorities.

Issue: Lack of a centralized information source on alternative development activities

hinders improved project planning and implementation.

A lack of institutional memory within AID, and other bureaucratic constraints, work against incorporating lessons learned from past activities into new project plans. The AID project approach incorporates numerous technical and contract groups and information gathered by these groups may or may not reach CDIE files. Thus, potential lessons learned from early activities may not be used to improve current projects or the design of future projects. Stringent requirements for filing project studies and reviews along with improved training of AID personnel, emphasizing area history, could promote use of "lessons learned" materials. Additional requirements for contractors to generate logs of activities and results from their efforts could be useful in future program planning. AID could strengthen its requirements for filing contractor reports and other project-related information with CDIE to assure that this resource is easily available for future project development.

Option: Congress could direct AID to establish and maintain an interpretive database on institutional experiences and development project evaluations in the Andean region.

A large body of information exists on development in the Andean region, but much of this information is "gray literature" and can be difficult to access. AID currently is developing a management information system (MIS) database on AID alternative development projects in the Andean region to improve its ability to measure the impact of these efforts. The system will be updated semi-annually and will include a variety of economic and project data. This effort could be expanded to incorporate the activities of other donor groups operating in the Andean region, thereby supporting improved donor coordination. Once established, project planning could require a database search to identify potential cooperative opportunities.

However, by incorporating the broad array of activities, database development and maintenance tasks would be increased dramatically. Additional financial resources might be needed and without additional appropriations could come at the expense of more applied activities. In addition, the ongoing United Nations effort to develop a Sustainable Development Network (SDN) could complement AID's MIS effort. The SDN effort is intended to assist less developed countries to develop and maintain data on domestic development activities with an ultimate goal of developing a global network.

DONOR COORDINATION

The narcotics problem is immense, and the impact of one donor is likely to be small. Many bilateral and multilateral groups are actively working toward a variety of development and coca control goals. Coordination of the numerous organizations involved in the Andean countries poses a difficult problem, yet it could yield large benefits in achieving comprehensive counternarcotic and development goals. The Organization of American States identified the need for a coordinating body for early development efforts in the Chapare to coordinate the activities of nearly 54 donor organizations. The need for such coordination throughout the Andean region remains.

Issue: Lack of donor coordination has reduced the effectiveness of rural development and crop substitution efforts in Andean drug-producing nations.

Uncoordinated donor activities can result in duplicative or counterproductive efforts. Development funds may be spent on similar projects without incorporation of 'lessons learned.' Similarly, lack of coordination can reduce opportunities for efforts aimed at solving mutually identified problems and preclude potential for expanded efforts or building on current activities. "Reinventing the wheel" may have high costs in overall terms of donor funding.

Option: Congress could direct the U.S. Department of State to establish a coordinating committee comprised of U.S. development agencies, those receiving U. S. funds for development activities, and national government counterparts to improve coordination of development programs.

A variety of U.S. agencies and international institutions, and multilateral banks receive U.S. funding for development activities in the Andean region (e.g., AID, InterAmerican Foundation, World Bank, InterAmerican Development Bank, United Nations). A committee composed of representatives of these organizations could be created to develop a unified alternative development approach for the United States and ensure that activities complement one another or at least do not work against each other. Such a committee could be responsible for setting a development agenda, prioritizing needs, and linking similar activities among cooperating groups.

However, coordination by committee can be time-consuming. Scheduling meetings and preparing committee reports would add to staff duties. Further, authority would be needed to ensure committee findings and recommendations were adequately considered by individual implementing agencies. Such additional bureaucratic processes are unlikely to be popular among implementing agencies.

Issue: Coordination between enforcement and development activities is inadequate.

Diverse or conflicting goals and operations of the numerous agencies (e.g., U.S. Department of State, Drug Enforcement Administration) active in the Andean nations have adversely affected local response to development activities. For example, nondevelopment operations have led to some distrust of development personnel in certain locales. Thus, coordination of all agency activities may be required to improve acceptance of U.S. development groups. Enforcement typically is dependent on maintaining a certain level of secrecy and, possibly, coordination with develop-

ment activities would be seen as potential 'leaks.' Nevertheless, these two activities necessarily complement one another and, without coordination, have the potential to detract from each other's effectiveness. Coordination of enforcement and development activities should occur at high levels, with clear separation at the field application level.

Option: Congress could create an interagency coordinating body composed of representatives of the agencies involved in development and enforcement in the Andean countries (e.g., AID, InterAmerican Foundation, U.S. Department of State, Drug Enforcement Administration).

A coordinating group with representatives from the agencies involved in development and supply control activities in the Andean region could promote unified direction for U.S. efforts. Congress could choose to create a separate task force or place the responsibility under an existing agency. The Office of National Drug Control Policy currently coordinates agency activities related to international and domestic demand control, interdiction, and financial systems, and thus may be an appropriate entity to coordinate the broader picture of narcotics-related activities. However, as an executive branch office, congressional investigation and oversight of committee activities could be curtailed.

INTEGRATED NATIONAL DEVELOPMENT

The extent and importance of the coca economy in the Andean nations strongly influences the ability of narrowly focused, short-term efforts to achieve promising results in coca substitution. Development groups have identified a variety of goals ranging from the highly specific (e.g., building agroprocessing plants) to more general (e.g., increasing rural incomes), but all are based on general rural development. Achieving this goal, however, requires development activities to

fulfill a broad number of needs concomitantly. For example, whereas the crop substitution efforts in the Chapare region concentrated on identifying high-value crops, little effort was invested in developing processing, transport, and marketing mechanisms. This has changed under the current project (i.e., CORDEP), however, and a regional development approach has been embraced.

Alternative development programs could be enhanced further through integrated development strategies that expand options for those involved in the coca economy. Development, agricultural or otherwise, in the Andean countries might best be approached in terms of economic diversification. Diversification of local and regional economies could include agricultural options, light industry, and service operations.

Should efforts continue to focus on narrowly circumscribed regions and solely agricultural opportunities, the chances for coca reduction success will be similarly narrow and circumscribed. Rural development alone may be insufficient to extricate these countries from their economic dependence on coca production. Increasingly, urban poor have become involved in the coca economy as farmworkers, processors, and transporters.

Issue: Short-term project cycles reduce the potential for effective, integrated alternative development efforts.

Alternative development is not a short-term problem nor likely to be solved with short-term solutions. The transition time from coca to alternative production systems is likely to be lengthy and programs or projects must consider this investment time. Moreover, incremental substitution programs are likely to be more attractive to potential participants. Efforts likely will need to be long-term irrespective of the approach taken to promote alternative crops or livelihoods. Nevertheless, short-term project cycles are standard in U.S. development activities, in part, driven by financial management requirements.

Option: Congress could expressly identify “no year” funding status for AID crop substitution projects to remove the current constraints associated with fiscal year spending and short-term project deadlines.

Long-term project cycles could contribute to a sense of continuity for program participants and recipient countries. Such stability could contribute to reducing the perceived risks associated with adoption of alternative systems. Long-term project cycles could also assure efforts are not redirected based on political changes.

However, cross-year funding could complicate bureaucratic requirements and increase budgeting difficulties. Such a change would also require concomitant changes in project reporting, evaluation, and review to ensure that despite longer timeframes, project difficulties are noted and resolved expeditiously.

Issue: Development activities designed to reduce coca production have been created with insufficient understanding of the existing sociopolitical, economic, and environmental conditions of recipient countries.

Alternative development programs largely have been developed by U.S. agency personnel. Yet, the existing sociopolitical, economic, and environmental conditions of the Andean countries significantly influence whether or not these programs will succeed. Program components may be based on counternarcotics goals, rather than the underlying development needs to shift black-market economies to legitimate markets. In large part, this might be addressed by increasing the level of host nation participation in program development.

Option: Congress could create an International Andean Commission responsible for developing an integrated strategy to reduce economic dependence on coca.

This commission would be interdisciplinary, composed of technical experts from the United States, Andean, and other concerned foreign

nations. The group would serve as a long-term inclusive coordinating organization unencumbered by U.S. programs, but including NGOs, private-sector, and grassroots and stakeholder organizations to oversee long-term development programs. The commission could address practical technical needs for successful development and be responsible for oversight of impacts of development activities.

Congress could create a similar commission composed of domestic agencies and U.S. representatives of the Multilateral Development Banks (i.e., InterAmerican Development Bank, World Bank, etc.). However, such a commission may appear strictly bilateral, which is already unpopular in host countries. Further, it may be no more able to solve development problems without a significant Andean presence.

IMPROVING CROP SUBSTITUTION EFFORTS

The importance of coca in the national economies of the Andean countries suggests development efforts narrowly focused on improving agricultural opportunities alone are unlikely to achieve broad coca reduction goals. The Cochabamba Regional Development Project (CORDEP) has expanded crop substitution efforts in the Chapare region to diversified agricultural development throughout the Cochabamba Department. However, the current effort does not adequately address alternative development for participants in the coca trade in nearby departments also involved through cocaine elaboration and as migrant workers.

Existing information on the extent of the economy, populations, and sectors dependent on coca indicate it is broadly distributed. Over the long term, single-sector development is unlikely to create stable national development of the kind needed to shift economies to legitimate enterprises nor fulfill the economic diversification goal of alternative development. Thus, alternative



Developing value-added industries, such as this textile factory in Meellín, is one mechanism to diversify economies and increase the value of locally produced raw materials.

development efforts for Andean countries need to incorporate options for nonagriculturists as well.

This thinking has already been articulated in AID documents (55), although not yet demonstrated through implementation. Opportunities may exist in developing mineral resources, light industry, etc. to diversify economies, particularly for the urban populations currently involved in the coca chain. This issue is beyond the scope of the present study, yet is likely to be critical for achieving coca reduction goals. This might be addressed in part by expanding the range of resource-based alternatives and undertaking actions to ease the transition from coca-based to legal livelihoods.

■ Expanding the Range of Alternatives

The Andean countries have a wide range of renewable resources that could be developed to increase economic opportunities for producers. Indeed, many coca-growing areas are more suitable to some of these options than traditional

agriculture. For example, in the Alto Huallaga, most coca is produced on steep slopes where agriculture is environmentally, if not economically, unsuitable. In the Chapare region of Bolivia, logging was the primary economic activity until the mid-1970s when coca expansion eclipsed the industry (39). However, the existing development thrust is largely agricultural. Projects that focus on forest, wildlife, and aquatic resources, integrated resource use, and related industries are likely to require an expertise-building period prior to implementation.

Issue: Agricultural alternatives have focused on export markets to the exclusion of domestic market opportunities.

The value of smallholder agricultural production in the Andean countries is low relative to other sectors. To some degree this is the result of national food policies that maintain low-cost food for urban areas (6). In addition, some analysts suggest competition with P.L. 480 (The Agricultural Trade and Assistance Act of 1954, as amended) food imports may also contribute to this condition (26,58). Increasing the value of domestic agriculture through domestic policy adjustment could have larger beneficial effects on national agriculture generally and rural economies and crop substitution specifically.

Import substitution may offer an opportunity to diversify markets for some producers involved in substitution programs and contribute to increasing national food supply. This approach has generated some success in a cooperative project among the Food and Agriculture Organization, the United Nations International Drug Control Programme, and the Pakistani Government in developing alternative employment for opium cultivators. Similar activities could be undertaken in the Andean region with long-term goals of increasing the value of agriculture domestically as well as internationally.

Option: Congress could direct AID to increase attention to import substitution opportunities

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in crop substitution to meet local and national market needs.

Although cropping systems incorporating staple crops exist, most effort seems to be placed on developing export agriculture. International agricultural research centers (IARCS) in the Andean region (*Centro Internacional de la Papa, Centro de Investigación y Mejoramiento de Maíz y Trigo, Centro de Investigación de Agricultura Tropical*) have developed improved cultivars and production practices for several staple crops (e.g., potato, corn, rice) and could provide a valuable technical resource for development activities.

However, increased attention to local and national markets could come at the expense of attention to possibly higher-priced export markets, if an appropriate balance is not defined. Further, without concomitant agricultural policy reforms that increase the value of domestic agriculture, available national markets may be inadequate incentive for producers to shift to legitimate crops.

Issue: Greater investment in Andean agricultural research and extension is needed.

Enhancing agricultural profitability in the Andean nations will require a continuing and significant investment in research and extension to develop alternatives and demonstrate techniques and technologies to potential adopters (12). Research and extension activities were large components of early crop substitution efforts in Bolivia and led to numerous alternatives for coca farmers. However, this effort has declined and continued devotion of funding to long-term research and extension activities is hampered by pressure to produce immediate results. Small-scale farms are largely the rule in coca-producing zones and opportunities to intensify their production are needed.

Although several IARCS conduct research on crop improvements directly applicable to the Andean region, there are no similar institutions focusing on integrated farming systems such as polyculture and tree crop research (agroforestry)



Access to external markets is highly dependent on adequate transport infrastructure. Largely, agricultural commodities produced in coca-growing regions are sold at the farm gate or in local markets such as this one in Peru.

(33). One Consultative Group on International Agricultural Research institute focuses primarily on agroforestry--the International Council for Research on Agroforestry (ICRAF), however, it is located in Kenya, hundreds of kilometers distant from tropical wet forests ecologically similar to those of the eastern Andean foothills. Agroforestry research previously carried out in Peru by North Carolina State University largely was an offshoot of traditional agricultural research, yet highlighted the importance of perennial tree crops in tropical agriculture. These efforts have ceased, however; largely due to violence in the area.

Option: Congress could authorize funding through AID for development of an integrated farming system research center (IFSRC) in the Andean region.

An IFSRC could support efforts to develop improved traditional agriculture systems. Several IARCS in Latin America could provide a valuable resource in development of an IFSRC in the Andean region. IFSRC research could focus on highly productive crop combinations, improved water and nutrient management, cultivar improvements, and agronomic research to identify

appropriate production practices to assure quality products to meet market requirements.

Research and extension activities could emphasize the local and national research centers to promote institution building and skill development, thereby improving the potential for activities to continue after direct assistance is withdrawn. Agronomic management research could be oriented to on-farm, farmer-participation production trials, involving the local farm population in direct participatory research. Extension activities could emphasize on-farm demonstration and farming systems to maximize the diffusion of new technologies and practices to rural adopting populations.

Development of a full-scale research center is likely to be costly. Yet opportunities to pool resources of many donors could alleviate the financial burden and contribute to a larger effort and wider use and acceptance of the institution. Alternatively, financial investment in the *Instituto Boliviano de Tecnología Agropecuario-Chapare* (IBTA-Chapare) could be increased. This institution has undertaken alternative crop research for nearly a decade and already contains substantial expertise. However, since IBTA-Chapare is a Bolivian institution, it may be difficult for practitioners in other areas to access.

Issue: Insufficient attention has been placed on developing forest resource exploitation options.

The importance of sustaining tropical forest resources has been highlighted in the last two decades and recently was underscored by the United Nations Conference on Environment and Development. Bolivia, Colombia, and Peru have substantial areas of remaining natural forests with potential for biodiversity conservation and forest management (33). For example, the value of forest products (e.g., nuts, fruits, latex) harvested from an extractive reserve can be longer-term and significantly higher than that offered by one-time logging operations or conversion to agricultural production (48). Opportunities also exist for

“chemical prospecting” in tropical forests to identify compounds with commercial potential. Sustainable timber exploitation technologies also exist and have been demonstrated in the Palcazu Valley in Peru. Such innovative operations could be tested and adapted to other forest areas. Despite these potential opportunities, efforts will be needed to increase the understanding of tropical forest management, specifically in the Andean region (33).

Forestry opportunities have now taken a more prominent position in U.S. alternative development efforts in Bolivia (21) and would be appropriate for other coca-producing areas as well. Full-scale research centers in relevant Andean forests are needed, however, to promote forestry activities. Initial activities could focus on existing forest management technologies that seem successful, such as those at the experimental level in the Palcazu Valley, Peru (52). Such an effort, however, would require significant financial investment over a 10-to 20-year period.

Option: Congress could authorize finding through AID to establish a full-scale, state-of-the-art, tropical forest research experiment station in the Andean countries.

While a number of tropical forest research stations exist worldwide, none are in the humid tropical Andean region. Given increasing concern over conservation of the Amazonian rainforest, this would seem to be an appropriate site. A major tropical forest research center could be located in a humid tropical Andean region and several sub-centers could be located in other places to conduct site specific activities and adaptation of identified technologies. These experiment stations could concentrate on conservation and forest management technologies that use forests and species native to the coca-producing regions. The U.S. Forest Service, Institute for Tropical Forestry in Puerto Rico could provide a valuable resource for research station development.

Concomitant with on-site research efforts, education and training opportunities could be

made available for conservation, forest, and protected area scientists from tropical countries. Professionals trained at those stations could fulfill necessary roles in development and extension of forest management systems to local populations.

Issue: Insufficient attention has been placed on examining potential wildlife and wildland resource use options.

Wildlife-centered economic development has become more acceptable and research efforts are being undertaken to determine sustainable yields and appropriate husbandry practices. Techniques for raising/producing certain wildlife species have been developed and are easily incorporated in rural communities with little capital investment. For example, experimental programs for ranching of green iguanas have now spread from Panama to other neotropical countries (7,62). Licensing and protection mechanisms that make farming and ranching of wildlife more profitable than taking from the wild are being implemented in the region (46). The International Union for the Conservation of Nature and Natural Resources and other international resource organizations are working to create viable legal markets for wildlife and wildlife products in conjunction with protecting habitats and wild populations.

Wildlife-based tourism has grown at least 20 percent annually since 1980 (58,99), and has been described as a reasonable approach for sustainable wildland development. Tourism offers an opportunity to earn foreign exchange and provide employment for local communities. Where tourism is developed properly, it may have a greater potential for generating local income than most traditional farming or ranching activities.

Option: Congress could direct AID to provide assistance for wildlife industry development in the Andean countries.

Efforts could include extension of production techniques, development of educational materials, and programs on potential benefits from farming or ranching and the needs for resource

conservation to support such development. Market identification and logistical needs to meet markets will be critical for industry development. Existing programs have tended to be production-oriented, as were the initial crop substitution efforts.

Coordination with other donors in the Andean region could contribute to developing an adequate support structure to handle transport and marketing opportunities for producers. Further, areas suitable for wildlife production may lie outside the current region of AID focus, yet are of interest to other donors.

Option: Congress could direct the U.S. General Accounting Office to review current U.S. trade regulations affecting wildlife and wildlife product imports in light of changing production methods.

Current regulations on wildlife imports have been based primarily on wild-gathering as opposed to established ranching and farming systems. Size and quantity restrictions suitable under these conditions may not be appropriate when trade is not affecting wild populations. A review of existing trade regulations on wildlife and wildlife products could evaluate potential adverse effects of existing regulations on developing wildlife industries.

Option: Congress could direct the U.S. Park Service, U.S. Forest Service, and U.S. Fish and Wildlife Service to give priority to Andean participants in their respective international nature tourism training programs.

Training programs offered by the U.S. Park Service and the U.S. Forest Service to foreign government officials currently focus on cultural and nature-based tourism and buffer zone management. Programs might be expanded to include training opportunities for professional guides, operators, and protected area staff to promote sustainable development of wildlands. Training should include land-use planning, environmental impact analysis, and tourism monitoring system

development to improve the abilities of national governments to determine optimum tourism growth and sustainable tourism industries. Without these capabilities, the tourism industry is likely to be short-lived or encounter significant problems (7).

Issue: Aquatic resource development has received little attention in development efforts.

Potential exists to expand fishery production in the Andean region to offer an alternative to coca production and provide additional protein sources for national populations. The numerous lake and river systems contain a variety of harvestable organisms and, with application of appropriate technology, their productivity could be enhanced (47). Past fishery development projects have focused on high-value species and have for the most part been unsuccessful (37). Efforts to promote subsistence aquaculture in Bolivia were similarly unsuccessful. Nevertheless, international efforts could focus on artisanal fishermen to maximize occupational opportunities. Although fisheries may not be significant in some coca production regions, they could increase in importance within the context of national development.

Constraints to developing Andean fisheries are largely due to a lack of information on the extent and quality of the various resource systems, level of resource extraction, and fishermen themselves. Significant postharvest losses characterize existing artisanal fisheries due to shortfalls in handling, processing, and storage technologies and transport infrastructure (47).

Option: Congress could direct AID to conduct an aquatic resource inventory for the Andean countries to complement ongoing alternative development programs.

An aquatic resource inventory was contracted by AID in 1983. Although the survey focused on the Chapare region, it could be updated within the context of alternative development opportunities in general and similar efforts could be undertaken

for other coca-producing zones. A cooperative effort involving AID, the U.S. National Oceanic and Atmospheric Administration, International Sea-Grant Program, and the Andean countries could inventory existing aquatic resources and identify potential for improving production and harvest opportunities.

Alternatively, the Andean countries could take advantage of existing international expertise in aquatic resource management and development. International research organizations, such as the International Center for Living Aquatic Resource Management (ICLARM) that conducts research on tropical fishery management and production, could be tapped to assist in fishery development. Congress could promote such support through funding to ICLARM and increased collaboration with U.S. and Andean universities to conduct applied research on aquaculture development appropriate to the Andean countries.

■ Easing Transition to Alternative Livelihoods

Strategies to enhance coca-substitution efforts must address a wide variety of constraints from production to marketing. Producers are unlikely to cease coca production in favor of alternative crops or activities if they cannot be assured that a market exists and that the mechanisms for production, harvest, processing, and transport are in place. Nevertheless, the current support structure to sustain alternative livelihoods is lacking or inadequate in several areas: insufficient technology and technology transfer, lack of markets and marketing assistance, unavailable or unaffordable credit, and inadequate agroprocessing facilities and transportation systems (20,49).

A guaranteed sufficient quantity and quality of product must be available to interest international markets. This has been a difficulty to date, although efforts to expand production areas and increase use of modern production technology are underway. Promoting producer organizations offers an opportunity for smallholders to combine

products to reach the necessary threshold level and, thereby, enter a market. Contract farming may provide a long-range prospect for assuring sufficient product quantity. While this approach can be very successful, it requires firm commitment on the part of agroprocessors and advanced agronomic understanding of crop requirements to achieve standard product quality.

Revision of credit programs could improve the opportunities for smallholders to obtain financing for entering legitimate production systems. Credit revisions could mimic current U.S. subsidy programs, providing loans to farmers at lower rates than those currently available in the Andean countries. Such an effort, with planned obsolescence as a goal, could be relatively short term, provide appropriate grace periods prior to repayment (i.e., allow for real production to occur), and perhaps augment or replace current coca eradication payments as a method of inducing change.

Issue: Existing terms for agricultural credit reduce its availability and discourage farmer investment in improved legitimate systems.

There are a number of disincentives to investment in agricultural production improvements in the Andean region; these stem largely from national economic and political conditions (e.g., rural poverty, risks to personal security). Yet, one mechanism open to U.S. and multilateral organizations to improve investment opportunities is to increase the availability and affordability of agricultural credit. Coca farmers tend to be smallholders, often without land title, few personal capital resources and, thus, little access to normal routes of credit. Recent actions by national governments have improved the outlook for gaining land title, but, bureaucratic constraints make the process slow.

Within the context of coca-substitution programs, opportunities for credit exist; however, evidence suggests insufficient attention has been paid to developing appropriate credit packages for coca farmers. Loan rates are high, in some cases collateral terms are difficult to meet, and

repayment schedules seem unrealistic for resource-poor farmers. Credit availability and affordability could be further attenuated under alternative development programs that expand the range of resources exploited, processed, and marketed.

Option: Congress could direct AID to amend the current credit Grant Agreement process to require the private voluntary organization (PVO) selected to include host country participation in developing credit terms.

Credit components of development projects are intended to improve opportunities for the target population to participate in the planned intervention. However, in some cases, credit terms restrict the ability of individuals to participate. For example, existing credit under CORDEP is made available through a grant agreement between AID and a private voluntary organization. However, the terms of credit are so high that credit is essentially unavailable for most smallholders (49). The existing Grant Agreement process used by AID could be amended to ensure host countries are adequately involved in development of credit eligibility requirements, loan rates, and repayment schedules.

Credit could be made available on a “suspensory loan” basis. This would allow a proportion of the capital sum normally repayable to be written off over 5 years, or some other term depending on the activity. The scheme could replace the current “payment” for coca eradication in the production phase and might also promote full private-sector involvement in the region’s development. The cost to AID or national governments would be unchanged, but funds would be guaranteed to go into productive development, which is not assured under the present system (49).

Issue: Additional effort is needed to promote private investment in value-added processing.

Increased agricultural productivity is likely to do little for producers’ economic well-being if

they cannot effectively and efficiently apply postharvest technologies. Such applications will be necessary for alternative crops to become significant in terms of total agricultural exports. Success, in part, depends on establishing cost-effective postharvest processing, enhancing producer efficiency through reduced production costs and increased yields, and improving access to markets. The United States has provided support for processing facilities with respect to crop substitution efforts (table 1-3). Creating incentives for marketing these products could complement this investment. Loans to the private sector at realistic interest rates could promote entrepreneurial activity, and ultimately replace the need for AID and other contributing institutions to maintain the present high level of investment in infrastructure and agroindustry.

Option: Congress could direct the Overseas Private Investment Corporation (OPIC) to make the Andean region a priority.

OPIC promotes U.S. investment in developing countries by providing insurance against numerous risks, financing investment projects, and providing investment counseling. OPIC could develop a portfolio of opportunities in the Andean region to make available during counseling to encourage investment in the Andean region.

Increased investment could expand the array of employment opportunities in the Andean countries. However, if approached without sufficient planning, it could lead to haphazard growth and potentially complicate national economic development. Mechanisms for coordinating investment and development efforts could address this potential problem. For example, investments for agroprocessing of alternative crops could be coordinated with AID and national governments to ensure the production, processing, and transportation components are synchronized.

Option: Congress could reduce tariffs on value-added products from the Andean countries for 10 years to promote development of the processing industry.

Raw materials tend to be less valuable than processed materials, and processing activities can increase national employment opportunities. Typically, tariffs increase as products move through the processing chain (i.e., raw materials generally are subject to lower tariffs whereas processed items have higher tariffs). This aspect of U.S. trade policy has been suggested to reduce incentive for development of value-added industry in exporting nations. An examination of tariff policies on value-added products that might be exported by the Andean Nations is needed to determine if this policy adversely affects development of processing industries.

Value-added processing provides a multiplier opportunity for economic improvement. The United States could foster development of such industries by providing preferential treatment for value-added products associated with alternative development programs under the authority of the Andean Trade Preference Act. Such an action could be given a specified lifetime, long enough to allow industrial development and stabilization. As capability increases with experience, opportunities for Andean extension into other national and international markets could improve. Other countries that currently participate in alternative development might be induced to provide similar preferential opportunities.

Issue: Lack of infrastructure hinders success of alternative development efforts.

Inadequate infrastructure exists to support alternative development (e.g., paved roads, postharvest handling, storage facilities, agroprocessing plants). Yet, infrastructure development tends to be approached slowly because of the potential benefits that might accrue to coca transporters (i.e., roads are seen as potential landing strips for narcotics traffickers). Despite the fact that infrastructure development might initially contribute to the coca economy, alternative development and production cannot occur without the availability of adequate transportation and marketing routes.

Table 1-3--Value-Added Processing Investment in the Chapare Region

Industry	Source of finance	Dollar value capital	Comment
Coffee pre-processing	AID Project 412	\$ 73,835	Started in 1980; Project 412 in 1990.
Latex pre-processing	INC - AID	32,900	Started in 1970; Project 412 in 1990.
Tea processing	China -1984	108,000	In production.
	AID Project 412	166,728	
Glucose plant	Universidad Mayor de San Simon/UNDCP	307,174	installation now underway.
Vinegar plant	Universidad Mayor de San Simon/UNDCP	175,298	Installation now underway.
Yuca and banana drying	AID Project 412	73,897	Not yet in operation.
Banana and kudzu drying	Universidad Mayor de San Simon	105,572	Starting production.
Mint oil extraction	AID Project 412		Starting production.
Lemon balm plant	AID Project 412	103,200	Working; low oil return per hectare.
Milk plant	Public Law 480 UNDCP	3,200,000	Project incorporates health aspects.

SOURCE: B. McD. Stevenson, "Post-Harvest Technologies to Improve Agricultural Profitability," contractor report prepared for the Office of Technology Assessment, May 1992.

However, significant fault has been linked to the methods and approaches used by U.S. and multinational development groups to develop land transportation routes in the tropics. Adverse environmental impacts associated with road-building in South America are highly visible (e.g., increased erosion, forest loss, poaching). Increased attention to developing mechanisms to mitigate such impacts should be included in project design and planning.

Option: Congress could direct AID to increase support for improving rural-urban trade networks, including roads, trucking, communications, and postharvest handling facilities.

Primary constraints to marketing alternative crops and products largely are linked to inadequacy or lack of infrastructure. Increasing capability to handle, process, and transport products to domestic and international markets could improve the ability of alternative resource exploitation activities to compete with coca. Increased attention would be needed to address the potential environmental impacts of infrastructure development, particularly road systems.

This is likely to be a long-term and costly endeavor, requiring a substantial increase in financial resources for assistance projects. Additional burdens on staff time could reduce efforts on production-related activities. Nevertheless, without ability to move products effectively and economically, alternative products are likely to remain at a disadvantage relative to coca.

Issue: Meeting food quality and safety requirements for agricultural exports can pose difficulties for some alternative crop producers.

Increased share in the international market can contribute to improving the economies of the Andean countries. Although crop substitution components of alternative development programs have focused on export markets, additional effort is needed to assist producers and processes to meet the quality and safety criteria required in the international marketplace (53).

The United States maintains a broad range of trade policies, ranging from import quotas and tariffs to complex food safety, sanitary, and phytosanitary requirements. Meeting these re-

quirements is often difficult for developing nations. Assistance in developing capacity for meeting these standards could contribute to increased competitiveness of Andean products. Assisting the Andean countries in improving their competitiveness in international markets could yield additional benefits by increasing their range of trading partners, encouraging foreign investment, and improving national food systems.

Option: Congress could direct the U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) and Food Safety Inspection Service (FSIS) and the U.S. Department of Health and Human Services, Food and Drug Administration (FDA) to assist the Andean countries to improve the quality and safety of agricultural export products.

Authority for entering into international cooperative work exists primarily for APHIS, although FDA and FSIS possess limited authority for providing assistance. Current APHIS cooperative efforts are designed to assist developing countries meet U.S. inspection standards and quality requirements and thereby facilitate imports to the United States. Similar activities among FDA, FSIS, and the Andean countries could address other processing and marketing areas.

However, increasing agency responsibility without a commensurate increase in fiscal resources could come at the expense of the primary mission. Funding and responsibilities could be increased for a specified period to provide training and development of expertise in the Andean countries with periodic reports to Congress that evaluate the program's progress.

Issue: Lack of product quantity hinders smallholders from entering large, high-value agricultural markets.

Despite the existence of alternative crops, production remains at low levels that inhibits entrance into lucrative markets. Opportunities are needed to expand the production base to increase product availability or aggregate the production



KEVIN HEALY, INTERAMERICAN FOUNDATION

Steep topography and difficult road conditions in many rural areas may hinder expanded production of renewable resource products by limiting easy access to inputs and markets.

of numerous smallholders. Strong producer organizations could overcome the problem small individual producers have in negotiating just prices for their product.

Option: Congress could direct AID to increase efforts to encourage producer organizations in the Andean region in order to reach product quantity thresholds for international marketing.

Lack of sufficient product quantity has constrained international marketing of some products of ongoing substitution programs. Producer organizations can provide an opportunity for groups of smallholders to consolidate production quantity to meet the needs of larger markets. For example, cocoa cooperatively produced and processed in the Alto Beni, Bolivia has been successful in competing in the international cocoa market. Ongoing alternative development efforts could be required to increase the focus on supporting producer groups for other alternative crops as well. However, increasing product quan-

tity must be accompanied by ability to move these products quickly and efficiently to markets to realize benefits from such an effort.

Alternative Option: Congress could increase funding for the InterAmerican Foundation to expand efforts in grassroots development in the Andean region.

The InterAmerican Foundation (IAF) has extensive experience in grassroots development in South America and many of its projects have demonstrated success (e.g., El Ceibo, see chapter 4). IAF has provided assistance for a broad range of cooperative activities including agricultural, textile, and handicrafts and such economic diversification could generate benefits beyond increasing product quantity for outside markets.

BIOLOGICAL CONTROL OF COCA

Coca eradication is seen by some as a necessary precursor to successful alternative development (57), whereas others view it as a futile attempt to curtail cultivation of illegal narcotic crops. Regardless, quantitative goals of a coca eradication strategy in the Andean region do not exist. It has not been determined what level of coca removal is required to achieve domestic supply-reduction goals.

Interest in the potential benefits of a biological control (biocontrol) approach to coca reduction is evident. Biocontrol may offer the least environmentally damaging and longest-term means of reduction, although the current state of the technology suggests likely levels of reduction will be difficult to determine. Predation levels evident in laboratory experiments do not necessarily translate into similar effects in the field. Thus, biocontrol cannot guarantee specific results (47, 57). Further, as long as coca remains an attractive crop, it is likely farmers would take measures to protect their investment.

U.S. activities abroad that involve a regulated substance, such as herbicides or biocontrol agents, require an environmental analysis under Executive Order 12114--either an Environmental Im-

pact Statement (EIS) or a less rigorous Concise Environmental Review (CER). However, the choice of document is at the agency's discretion. Experience with herbicide testing in Peru suggests significant sociopolitical constraints will be difficult to overcome without increased attention to rigorous testing and safety features for candidate coca control agents (13).

Several key technology factors hinder development of biocontrol agents: lack of inventories of potential agents, incomplete understanding of the efficacy of biocontrol (i.e., what level of reduction might be achieved through deployment of an agent), lack of understanding of what level of control is required to achieve 'success,' and lack of containment mechanisms. These needs could be addressed through a highly focused research and development effort, but, such an effort would be conditional on host country cooperation.

■ Coordination and Cooperation

Coordination and cooperation among donor and host countries will be critical elements for effective research and development of a coca biocontrol program. Traditional biocontrol development methodology includes search and identification of existing predators, screening for host-specificity, and testing. The search activities could be undertaken in the target range and other locations; however, efficacy testing needs to be conducted in the implementation site or sites with similar environmental characteristics.

Issue: Insufficient coordination and cooperation with potential host countries in planning and design of eradication programs reduces support for implementation.

Experience with herbicide testing in Peru suggests significant government and public participation will be necessary for a successful coca eradication effort (56). Incorporating public review and comment periods, broad dissemination of environmental impact reviews and methodologies, and coordination and cooperative efforts with national groups will be key.

The United Nations International Drug Control Programme (UNDCP) investigations into potential narcotic crop control opportunities highlight host country involvement and agreement. Currently, UNDCP is evaluating biocontrol potential through expert group meetings. Any activities that might result from these investigations will be conditional on host country agreement and cooperation in all phases (50). The U.S. Department of State notes similar agreements would be sought for U.S. bilateral eradication activities in the Andean region but currently little likelihood exists for obtaining them (57).

Option: *Congress could create a multinational commission, with representatives from donor and host countries, that would manage the research and development of a biocontrol agent for coca and the implementation of any coca reduction program.*

Creation of a multinational commission could provide for substantial host country involvement in developing a biocontrol program and perhaps overcome public resistance that was evident in the earlier chemical control research. Such a commission could be composed of U. S., Andean, and other interested country scientists and narcotics control policymakers. The commission could be responsible for overseeing the development and implementation of a coca biocontrol program, including determining acceptable levels of risk, desirable levels of control, and necessary testing and screening precautions. Such an international commission would serve to improve the coordination and cooperation of the various donor and host countries.

However, developing a commission could be a lengthy process. Competing agendas among participants could make agreement and direction difficult. Setting a lead country or chairman could alleviate some difficulties, yet, it could also give the commission an appearance of being dominated by single-member concerns or motivations. Nonetheless, without such cooperation and coordination, research and testing of potential agents

is also likely to be slow. Further, without host country agreement for implementation, any research runs the risk of being moot even before it is completed.

■ Information Needs for Decisionmaking

Information to support wise decisionmaking is fundamental to undertake a biocontrol program. Basic informational needs include identification of:

- . The level of reduction necessary to fulfill supply reduction goals,
- . The role of coca in the Andean ecosystem, and
- . Potential environmental impacts of a biocontrol program.

Issue: Lack of understanding of the level of reduction necessary to achieve supply reduction goals hinders establishment of clear target levels for eradication efforts.

The extent of coca reduction necessary to achieve supply reduction goals in the United States has not been identified and, given the questionable accuracy of historical data on coca production, it is likely to be difficult to derive. Nonetheless, setting goals and identifying mechanisms for reduction programs may require this type of information. For example, biological control of coca, while suggested as an environmentally benign alternative to chemicals, may only achieve low coca reduction in the short term. Information on how this level of reduction would affect overall cocaine availability could be used to determine feasibility of such an approach.

Option: *Congress could direct the U.S. Department of Energy, through its National Laboratory System, to conduct a supply/demand analysis to identify the relative level of coca reduction required to achieve domestic supply reduction goals.*

The National Laboratory System has substantial resources for computer modeling and could be directed to create an integrated computer model to

simulate the effects of several reduction scenarios on U.S. cocaine supply. Although numerous variables confound precision of such a model, resulting information could identify high-low scenarios to provide bounds for coca reduction objectives.

However, such a model would likely be based on existing narcotics data, the accuracy of which is questionable. Data on coca and cocaine are notoriously suspect, leading to widely varying estimates of the area under production, area eradicated and newly planted, potential leaf yields, and conversion rates from leaf to paste and cocaine hydrochloride. Thus, existing data used in such an analysis could lead to a “garbage in-garbage out” product yielding little new insight. Improved data collection could address this problem, although it would likely be a lengthy process. Alternatively, in the near term results could be given a “percent confidence” rating while new data-gathering activities were undertaken.

Issue: Little is known of the role of coca in the Andean ecology. Thus, determining potential adverse impacts of coca eradication is difficult.

Generating support for biocontrol efforts will require placing adequate attention on addressing the concerns of the potential host countries. Environmental concerns have been highlighted in previous activities and are likely to continue to play an important role. Information on the role of coca in the complex Andean environment would be important in determining the feasibility and appropriateness of a biocontrol program. This information could provide needed background information to help national government decisionmaking on the biocontrol of coca.

Option: Congress could direct the U.S. Department of Interior, Fish and Wildlife Service to conduct ecological studies of coca's role in the Andean environment cooperatively with host country counterparts.



U.S. DEPARTMENT OF STATE/IMM

Some fungi and lichens are natural coca pests that may significantly reduce the plants' productive life. Here, lichen covers the stem of a coca shrub.

Financial and technical support could be provided for a comprehensive study of coca in the Andean environment. Cooperative efforts among U.S. and Andean scientists could identify the range of coca species of interest and the role wild counterpart plays in local ecology. This information would be a logical counterpart to potential host screening studies on candidate agents and could further be used to determine potential areas of concern with biocontrol activities. However, such a study would require site visits in hazardous areas (e.g., Alto Huallaga) for observing and characterizing coca ecology. Substantial efforts would be required, in some cases, to assure participant safety in such a study.

Issue: The current environmental assessment process applied to U.S. activities in foreign countries is inadequate to identify the broad range of potential environmental impacts that might be associated with biocontrol efforts.

Despite government agreements during the 1987 herbicide testing in Peru, local populations and environmental groups felt inadequate oppor-

tunity existed for their input and discussion (56). The resulting public outcry over the potential adverse environmental effects of the tested herbicides was significant. Similar situations are likely to occur with a biocontrol program if inadequate attention is given to local participation in the environmental impact review process.

Determining potential environmental impacts of a biocontrol program will require a rigorous assessment effort. The instrument under which these environmental reviews currently are required (Executive Order 12114) allows agency discretion to undertake a Concise Environmental Review rather than a more comprehensive Environmental Impact Statement as required under National Environment Policy Act (NEPA) for domestic actions (13).

The legal status of NEPA with respect to the extraterritorial environmental impacts of Federal programs remains in doubt. However, it is clear Federal agencies involved in the proposed coca eradication program will be required to prepare some kind of environmental evaluation, either under NEPA or Executive Order 12114. Experience demonstrates the value of this environmental analysis can be enhanced if the relatively rigorous procedural requirements of NEPA are followed. In particular, the agency should ensure full public participation throughout the assessment process, environmental assessment early in the decision-making process, full discussion of alternatives and mitigation techniques, consultation with experts within and outside of government, and that the results of the assessment are meaningfully considered by involved decisionmakers.

Option: *Congress could choose to expand the authority of the National Environment Policy Act to include U.S. coca control activities in foreign countries.*

A rigorous environmental review process could alleviate some of the public resistance to coca control efforts. The Environmental Impact Statement (EIS) process required domestically could be an appropriate process for examining the full

array of potential impacts of a coca eradication method. However, expanding the U.S. Environmental Protection Agency's responsibility to include international EISS, would increase agency workloads substantially and would likely require a concomitant increase in staff and financial resources. Further, technical expertise for outlining requirements and reviewing EIS'S would be needed and could create a lengthier process. Changes in the process may be necessary to account for environmental differences between U.S. and Andean environments.

■ Technological Feasibility

Biocontrol methodologies exist, but there are considerable technological constraints to rapid implementation. Investigations into possible herbicides continue to be the primary focus at the Federal research and development level (45). Thus, if a biocontrol program is to be pursued, an extensive research and development period could be needed. Ongoing research is classified and conducted by the U.S. Department of Agriculture, Agricultural Research Service and cooperating agencies.

Option: *Congress could direct the U.S. Department of Agriculture to balance finding resources for crop control research between herbicides and biocontrol.*

Currently, biocontrol research is treated as part of an overall eradication method research program. Division of funds and activities are agency-discretionary and largely focused on chemical research. Nevertheless, balanced attention to both opportunities could be undertaken to assure neither development is disadvantaged if host country agreement is forthcoming.

Alternative Option: *Congress could place responsibility for coordinating a broad-based national research and development program for biocontrol with the Office of National Drug Control Policy, Counterdrug Technology Assessment Center (ONDCP/CTAC).*

There are numerous public and private research resources that could be appropriate to undertake or participate in biocontrol research. Currently, responsibility for development, oversight, and coordination lies with the U.S. Department of Agriculture. Responsibility for a broad-based research and development effort could be placed with ONDCP/CTAC, which holds responsibility for counternarcotic enforcement research of which eradication is one aspect. Coordination with the numerous Federal agencies appropriate to the preconditions for development (e.g., USDA, DOE, DOS) could be undertaken by ONDCP/CTAC to expedite efforts. However, recent Administration actions have downsized ONDCP significantly and without concomitant efforts to rebuild the Office, such a task might not be feasible.

Alternatively, Congress could choose to halt new programs for coca biocontrol research and continue existing programs under maintenance budgets conditional on the outcome of the UNDCP efforts in biocontrol. U.S. intellectual and financial resources could be directed to assist the United Nations effort if host country agreement were obtained. Such an approach would ensure the program was multilateral and assure the Andean countries of an international forum within which their concerns or grievances over biocontrol or coca eradication in general could be heard.

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