

PA-ABP-949
24540

Does the Coca/Cocaine Industry Offer Good Prospects for Bolivia?

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December 30, 1992

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Introduction

The U.S. Government opposes the cocaine trade because of the negative social effects cocaine has on the U.S. It would oppose that trade no matter what impact the cocaine industry had on Bolivia. Nevertheless, it is important for the U.S. Government to understand what is the impact of cocaine on Bolivia for at least two reasons. First is to coordinate counter-narcotics efforts with other U.S. policy objectives such as promoting development and stability: if cocaine is really vital to the economy, then eliminating it overnight could lead to poverty and downfall of the government. Second and perhaps more important, knowledge about the effects on Bolivia of the cocaine industry improves the ability to design a counter-narcotics strategy.

The theme of this essay is that the cocaine industry offers poor prospects for Bolivia in the 1990s. That thesis is developed in two ways. First is a demonstration that the cocaine industry causes distortions that inflict harm on legal economic activity and on society at large. The profits of coca/cocaine come at least in part because that industry does not pay for the damage it causes. Furthermore, if the coca/cocaine industry disappeared, legal economic activity could expand to fill at least part, if not all, of the losses from the ending of the coca/cocaine trade.

Second, the coca/cocaine industry offers poor prospects for growth in the 1990s compared to the prospects of legal activity. There is reason to believe that cocaine demand is not growing and prices are dropping. On the other hand, Bolivia has some excellent opportunities in mining, hydrocarbons, and tropical agriculture.

I. Distortions due to the Cocaine Industry

No one can deny that cocaine has had some positive effects on the Bolivian national economy, beyond just profits for the individuals who work in the industry. Cocaine exports have earned foreign exchange, which has made possible more imports and/or less external debt. Narcotraffickers have invested in, among other things, new buildings, modern-technology agriculture, and retail trade.

However, the coca/cocaine industry also has some negative effects. The cocaine industry creates a variety of economic distortions, that is, phenomena which would not occur if markets were working perfectly and if coca producers had to pay for all the costs that they impose on society. The root problem is that individuals in the cocaine industry prosper by not paying for all the costs their activity imposes on society. The technical term for this problem is "negative externalities," and the classic example is a factory which pollutes the air. If a company is choosing between two ways of making a product, with one method costing less but producing air pollution while the other method costs more but does not pollute, the company will make more profit if it chooses the polluting method. That makes sense for the company but not necessarily for society, because the pollution causes health problems. It would be wrong to say that the polluting method is more economical: it is cheaper for the company, but it is more expensive for society. Society would grow faster if the less polluting method were used: the benefits from more healthy citizens would outweigh the costs of cleanup.

Let us examine some of the distortions coca/cocaine causes in Bolivia.

A. Labor migration to ecologically fragile, isolated regions

The Chapare coca-growing region has a limited ability to absorb population. A detailed study by a Bolivian sociologist (Alberto Rivera) concluded that without coca, the Chapare region can sustain only 75,000 people,¹ whereas the population peak during the coca boom was about 350,000. The problems include ecological fragility and also remoteness from the regional export markets, i.e., the population centers of northern Argentina and southern Brazil. James Jones, an anthropologist who specializes in the region, argues, "Some areas of the Chapare, because of their ecological fragility, should have neither roads nor agriculture. And anyway, it is unlikely that sustainable markets will be found for production in such areas. So why build roads there? Why try to develop these areas?"² Surveys of Chapare residents reveal that many dislike the region and suffer from health problems since moving there; 95 percent retain homes elsewhere.³

In the absence of coca or of artificial stimulus to the Chapare, the natural direction of population flow will be to the Santa Cruz region to the southeast of the Chapare. Natural conditions there are well suited to a whole range of products; there is ample land for sustainable development for a large population; and the region is closer than any other in Bolivia to the large markets of northern Argentina and southern Brazil. The Economist summed up the most likely evolution without coca:⁴

Long-term, says Mr. Doria Medina [Minister of Planning and Economic Co-ordination], the best hoped for the altiplano farmers is not growing more and bigger potatoes for the local market, but leaving their small plots to go east as paid labour to the semi-tropical region around the city of Santa Cruz. Farming there is export-oriented, producing cotton, soya, wheat, cattle, and timber. That is where new jobs must come from, and where investment is starting to come in.

Despite its poor ecological conditions and the greater economic attractiveness of the Santa Cruz region, the Chapare attracted many new residents during the 1975-85 coca boom. The Chapare's population went from about 100,000 in 1976 to as high as 350,000 in 1985-88.⁵ This migration required a substantial (private) investment in housing, commercial facilities, infrastructure, and the like.

The investment for the Chapare population expansion turned out to have been largely wasted. When the coca boom subsided after 1987 (as documented below), the population fell quickly. By 1990, the population had fallen to 100,000 or less, according to Jones and Rivera. They did surveys in the Chapare and in the migrant-origin regions. As indirect indicators, Rivera cited a dramatic drop in the number of businesses and in the sales of those remaining open, e.g., a Chapare restaurant that went from serving 300 breakfasts daily to 20-30, and a bar that saw its beer sales fall from 20-30 cases per week to one.⁶ He reports land prices in the area fell 50% in the first months of 1990, reflecting the lower value when not used for coca leaf output.⁷ Jones writes, that highland seasonal migrants have "for the most part (but not totally) departed [since the coca price fall of 1989/90]; this emerges clearly from the interviews in both the High Valleys and the Chapare... Several [settler] respondents remarked the contrast in numbers of peones in the Chapare before and after the last coca price fall."⁸ The 1991 Rural Household Survey, the 1992 Census, and UMOPAR reports suggest that the population has if anything fallen further since Jones and Rivera did their surveys.

Besides the misallocation of labor across departments at the national level, the cocaine industry has also misallocated labor among sub-regions within the Chapare. The general rule has been that once an area begins to grow, it attracts government agents which then undermines the (illegal) economy and forces a population shift towards a more remote area. Rivera documents the rise and then fall of several local population centers. For instance, 90 of the 112 stores in Chimore are now empty; the population fell sharply after the arrival of the UMOPAR (anti-narcotics police) barracks. As dramatic was the decline of Shinahota from 12,500 people to 1,200, with the post-1985 dispersion of the coca industry to Eterezama, Villa 14 de Septiembre, and Ivirgarzama.⁹ This population pattern -- movement every few years to an area more remote from the state -- clearly wastes resources,

discourages long-term investments, and impedes the delivery of social services like education and health.

B. Displacement of legal industry.

Each dollar received from cocaine is not an additional dollar added to national income. The income from the cocaine industry is really the difference between what can be earned from cocaine and what could be earned were there no cocaine industry. To the extent that the cocaine dollar comes at the expense of a reduction in legal income by some significant fraction of a dollar, cocaine looks less attractive than it would appear at first glance (The same principle applies to legal industries: economies are adaptable, so it is rare indeed that one industry is indispensable to growth. The point here is that Bolivia could have done nearly as well without cocaine as it did with cocaine; the gross income from cocaine greatly overstates the extra income created by the cocaine industry).

The cocaine industry undermines the legal economy in several ways. One way is that sometimes those in the coca/cocaine industry harass those in the legal economy. Consider the experience of the IBTA agricultural extension service in the Chapare: "The few early promoters who volunteered [in 1985-6] to serve as extension liaisons in their communities were sometimes ostracized, even physically assaulted, by fellow residents." ¹⁰ Similarly, those in the cocaine industry pressure coca growers to forego eradication compensation payments: "I asked the farmer of case J12... whether he planned to eradicate any of his coca.. 'No -- The head of the sindicato and people here say that if you take money from DIRECO, then the DEA and the gringos will own the land.'" ¹¹ Narcos have at times raised the price of coca to those who are not producing other crops. ¹²

Second, the cocaine industry absorbs resources -- human, natural, and financial -- that otherwise would have been used for legal activity. Consider Bolivian non-coca agriculture. According to Bolivian economist Oscar Antezana, production in 1990 was less than in 1980 (13.8 billion 1980 bolivianos compared to 14.1 billion), ¹³ And this decline came despite a sharp expansion in non-traditional agriculture in the eastern tropics. The decline was steepest for foods for the domestic market, traditionally grown in the highlands (the decline of traditional highland agriculture was accelerated by a multi-year drought as well as by the

departure of farmers for the coca regions). As a result of declining output and rising population, food imports rose from 22 thousand tons to 310 thousand tons. Had the farmers going to the lowland areas not grown coca, they could have supplied much of this food need.¹⁴

Third, and more important than competition for resources, has been what economists call "the Dutch disease." The term "Dutch disease" described the problems the Netherlands had in the 1960s when a boom in one industry (natural gas) caused such an inflow of foreign exchange that dollars became cheap relative to the local currency, reducing the competitiveness of local products both in foreign markets and in the domestic market. The gain from the boom industry was largely if not completely wiped out by the loss of output from the other industries. That was a serious problem, because the boom industry could not last forever in the Netherlands where the boom was based on a depleting natural resource; the same could apply to the Andean nations, in that shifting drug tastes and accelerated enforcement efforts may reduce income from the cocaine industry.

Planning Minister Doria Medina argued that the Dutch Disease problem of uncompetitive industry was a real problem during the period of the coca boom, before and just after the stabilization program began.¹⁵ The respected private economic firm Muller y Asociados agrees:¹⁶

Por el lado negativo es evidente que la economía de la coca ha fomentado un problema conocido como la 'enfermedad holandesa' en Bolivia.... La industria manufacturera local sufre por causa de las importaciones baratas... Las participaciones de la manufactura en la economía ha caído de 15.0% en 1980 a 10.7% en 1989. Una parte de este descenso puede atribuirse al efecto del auge de la economía coca-cocaina.

Note that the argument is not that narcodollars are used to manipulate the exchange rate through some perversion of the Central Bank's auction system or the commercial banks' exchange windows. The thesis instead is that a large inflow of dollars has to have some effect on the demand and supply for dollars. Nor is the argument that the exchange rate has been inappropriate during the last seven years when the Central Bank has carefully kept the real effective exchange rate constant (with the boliviano depreciating enough to offset the higher inflation in Bolivia than in its trading partners). The argument is instead that without

the coca income, it would have been necessary to allow the exchange rate to fall in real terms, in order to stimulate exports and reduce imports.

To be sure, it is not clear how much difference a change in the exchange rate would have made. A more rapid depreciation might not have stimulated the economy much, because businessmen may have been more concerned about stability and predictability of the exchange rate after the hyperinflation episode.

Also, it is easy to exaggerate the problems from the Dutch Disease. A large increase in foreign exchange earnings is no problem if that increase will be sustained; the Dutch Disease relates to temporary and unsustainable booms. Planning Minister Doria Medina points out that coca fits this criteria well, as can be seen by the drop in income since 1989. Also, the problem highlighted by the Dutch Disease theory appears to be that the resources are poorly used, not that the resources are available. The theory argues that in general windfalls are badly spent rather than being wisely accumulated abroad during the boom to draw on later. Furthermore, the appreciation of the exchange rate undoubtedly hurts local production but it increases the real income of consumers who have cheaper imports.

C. Inefficient investment to launder and protect money

Cocaine income may be invested less and less productively than income from other sources. Narcotraffickers have to worry about disguising their money to protect it from the very real danger of seizure by the Government, which has frequently exercised its seizure powers under Law 1008, the basic law governing the coca and cocaine industry. The risk of seizure leads the narcotraffickers' to spend more on luxury consumption and less on productive investments than would someone who made his money in a legal business. The risk problem leads the narcotraffickers' to invest in areas based on the ability to hide their money, not based on the normal economic criteria. For instance, in the 1980s, traffickers sold imported goods at less than they had paid for them in order to launder money.¹⁷ Whatever benefit consumers gained was temporary and has to be offset by the loss to local producers and to government revenues from foregone taxes.

Despite sound economic policies, private investment in Bolivia was a meager 2% of GDP in 1986-90 (about \$100 million a year). There is no indication that the traffickers

invested back into the economy a significant portion of their earnings. Perhaps, as Planning Minister Samuel Doria Medina noted, there could be important positive effects from investments financed by traffickers who have left the business;¹⁸ so far, however, the effects do not seem to have been seen.

Not only has there been a dearth of investment, but the composition of investment has been distorted by the cocaine industry. Despite the risk that buildings will be seized, narcotraffickers have been attracted to investment in land and luxury buildings because of the ease with which money can be laundered and because of the prestige associated with owning property. Planning Minister Doria Medina argues that investment in property has been artificially elevated by those laundering money.

D. Less Economic Stimulus from Each Dollar of Growth

Cocaine is not only illegal, it is bad for development. In the economists' term, cocaine has few linkages, that is, the industry generates relatively little demand for local products and cocaine can not be used to feed into other industries. For Bolivia, Mario de Franco and Ricardo Godoy found, "each dollar of cocaine exported requires the purchase of \$0.03 of goods and services from the non-cocaine economy; in contrast, commercial agriculture, mining, manufacturing, and construction require the purchase of, on average, \$0.23 from the rest of the economy." That is a seven-fold difference.¹⁹ Presumably the difference is even greater if a comparison were to be made between cocaine and the legal non-sector excluding mining (such as tin and natural gas) which use many imported inputs.²⁰

On the other hand, there is a good side to the low linkages: cocaine has high income effects per dollar of sales because it uses few inputs. Similarly, it has high employment effects per dollar of sales, because it is so labor intensive. Plus coca leaf output has high foreign exchange effects because it uses few imported inputs. Consider the contrast between a dollar of coca sales and a dollar of tin sales: the tin generates less value added (it uses more inputs), it creates fewer jobs (it uses more equipment), and it generates less positive effect for the balance of payments (it uses more imported machinery and parts). But overall legal industries are more positive than cocaine because they do more to stimulate production

in the rest of the economy.

E. Excessive dependence on one cash crop

Many coca farmers produce only coca and food crops for their own use. Reliance on any one crop, which is called monoculture, is not healthy for an economy for several reasons. For one thing, the concentrated production of that crop makes ideal conditions for crop diseases to spread; indeed, a fungus called fusarium oxyaporum has been spreading among the coca plants in Peru's Huallaga Valley. Monoculture can also exhaust soils, because growing the same crop year after year drains the soil of nutrients and trace elements that might be replenished under a crop rotation system. Another problem with monoculture is that a country dependent on one product is extremely vulnerable if the price drops, due to new competition or to a fall in demand. As the coca price chart shows, it would seem that the price of coca leaves has been on a downward trend for some years, which suggests that reliance on coca as the only cash crop is not a wise proposition.

F. Loss of control over economic policy.

The cocaine industry has contributed to dollarization, which means that the dollar rather than the national currency is used to carry out transactions. The cocaine business is overwhelmingly on a cash basis, which means that it puts hundreds of millions in dollar bills into Andean economies, facilitating use of the dollar for everyday transactions. The more the dollar is used, the less the national currency is used. When the national currency is used only for small transactions, then government loses the ability to promote the economy through management of monetary policy.²¹

Dollarization is extreme in Bolivia: most bank loans are in dollars as are 70% of bank deposits; many higher-level private sector people have salaries that are in dollars; many purchases are carried out in dollars. One effect is to reduce the demand for boliviano currency notes. The personal estimate of a Central Bank source is that \$250 million in dollar bills may be in circulation in Bolivia. That is a huge sum in a country justly proud that the total deposits in banks, including foreign currency and time deposits, is up to \$1.4 billion. If

that were converted into bolivianos then the Central Bank would have a large entry on one side of its balance sheet which it could use to increase net foreign exchange reserves by 80% or it could increase the credit in the economy by 15%.²²

The negative effects of dollarization extends beyond the depression of foreign exchange reserves and of credit to the economy. The dollarization means that the exchange rate has little effect on the economy, since so many transactions are carried out in dollars. Changes in the exchange rate, one of the most powerful policy tools in the arsenal of a Central Bank, have less effect in Bolivia than they would if the boliviano were more widely used.

To be sure, cocaine is not the only factor causing dollarization in Bolivia. Economic policy makers interviewed, such as UDAPE Director Juan Carlos Requena Pinto, feel that the basic cause of dollarization was lack of confidence in government policy. Quite possibly so, but the cocaine industry was a contributory factor. The cocaine trade brought foreign exchange into Bolivia in the form of dollar currency notes, and the presence of those notes facilitated the use of dollars in everyday transactions.

Besides dollarization, another way in which cocaine has led to loss of control over economic policy is that governments have been forced to change policies to avoid money laundering. In order to keep track of funds entering banks, several Andean nations have had to re-introduce rules that were relaxed in order to free up the economy and to stimulate new business, rather than choking business in a sea of regulation. To date, this has not occurred in Bolivia. Bolivia retains wide-open banking features introduced as part of liberalization, e.g., no questions where money came from when making deposits. There is a real threat that complex rules to prevent money laundering may need to be implemented; some Bolivian "financieras" (quasi-bank financial institutions) are said to have used the liberal environment to engage in money laundering.²³ Such controls would endanger the effort to re-establish trust in the banks. That would be a blow to the Bolivian economy, because increased confidence in the banking system has been a major source of funds for Bolivia recently -- bank deposits by the private sector rose \$431 million from March 1991 to March 1992.²⁴

G. Consumption that does not raise living standards

Higher income in the coca-growing Chapare region has not translated into a visibly higher standard of living. The homes in the region have changed little in the last twenty years.²⁵ There are few signs of private productive investment, e.g., in agricultural machinery. The region has social services, education facilities, and health centers, that are not as good as would be expected from per family income from coca of \$3,000.²⁶ The diet consists primarily of yucca and rice, with meat eaten primarily on festival days rather than regularly during the week.²⁷ A survey of the residents concluded, "On balance, the Chapare is far from a paradise for many settlers. Although there are settlers committed to the Chapare at all cost, many others are not so committed. If they had attractive alternatives outside the Chapare, many settlers would leave."²⁸

As for the seasonal migrants, one survey found that their standard of living is poor. The migrants complained to an anthropologist (Jones) "sometimes with passion" about sickness and disease in the Chapare. Furthermore, their families left behind in the high valleys felt they did not benefit greatly from the migration: "The one interview that I had with women strongly suggests that migration often creates family tensions and other problems... Men often returned without money, the women said... The women spoke of vices their men acquired in the Chapare. 'They learned to drink and become drunkards; they continue to drink when they return.'"²⁹ The migrants do not seem to be attracted by the high income in the Chapare but instead driven by the poor conditions in the high valleys, where a year of drought can mean literal starvation. "The residents of ... upland communities have migrated seasonally to the Chapare to survive, not to accumulate capital for luxury consumption." In this view, "Migrants spent what they made on food and other basic necessities for the family."³⁰

The poor use of the cash income has several roots. For one thing, the Chapare is not a region sufficiently attractive for newcomers to set down roots: 95% of the residents retain homes in their areas of origin³¹, though admittedly this is partly due to the strong cultural ties with their home villages.³² This discourages investment and may encourage a carpe diem attitude. (Also, to be fair, it is possible that the ties to the regions of origin may have lead Chapare families to put their savings in those regions, in which case they have been saving their money rather than wasting it. However, there does not appear to be much

evidence this happened: there are few improvements in the high valleys from which many emigrants came).

Furthermore, when incomes rose so rapidly during the coca boom, farmers may have interpreted the increase as permanent rather than as a windfall. On the expectation that their incomes would continue for years to be at the new much higher level, the farmers changed their consumption pattern to include a variety of goods, like automobiles, they could not afford at the old level of income. Had the farmers realized that the income increase was a windfall, they might well have saved more of it rather than increasing their consumption. This is a classic example of the permanent income problem, investigations into which won Milton Friedman a Nobel Prize: the misinterpretation of a windfall as a permanent income increase leads to unsustainable consumption and little savings, leaving the windfall beneficiaries little better off than at the start. The new automobiles bought during the boom may now sit in one of the Chapare's various "car cemeteries." ³³

H. Other Distortions

The coca/cocaine industry may also contribute to a variety of other problems in Bolivian society:

- * Corruption may become more onerous because the traffickers are able to pay vast sums for bribes, which may raise the size of the typical bribe.

- * Cocaine may weaken legal and judicial institutions. Economic activity, and especially long-term investments, require confidence in the rule of law and the enforceability of contracts, both of which are undermined by weak police and courts. Cocaine may also have contributed to general lawlessness and a corresponding need for private security forces. The Bolivian National Police are concerned by the proliferation of security forces, a number of which are in fact linked to criminal groups. ³⁴

- * Cocaine can cut tax revenues. Smuggling may have increased, as the attention of the border officials was diverted to cocaine smuggling and as cocaine dealers looked for ways to repatriate their illegal profits. Also, if an important part of the economy -- namely the coca/cocaine industry -- pays few taxes, then the rest of the economy has to bear a heavier burden, which can reduce the ability of the legal sector to compete with those outside

the law.

* Cocaine can cause ecological problems, primarily by the dumping of vast amounts of chemicals. U.S. government studies indicate that in Bolivia, cocaine processors dump each year 1.9 to 5.6 million liters of sulfuric acid, 1.1 to 3.1 million liters of ethyl ether, .5 to 1.6 million liters of acetone, and from 7 to 317 million liters of kerosene, depending how much is recycled.³⁵ The processors simply pour on to the ground these dangerous chemicals, which quickly end up in the region's rivers.³⁶

* The presence of the coca/cocaine industry creates the temptation for local consumption. Cocaine and cocaine derivatives other than coca leaf are not used much in Bolivia. But the experience of other major drug-producing countries, such as Pakistan or Thailand, should be a cause for sober reflection: societies that had only small drug use became infected with major problems within a few years.

* The chimera of salvation through cocaine caused at least some of the governments between 1975 and 1985 to waver in their commitment to the economic reforms so badly needed by the Bolivian economy. Had Bolivia implemented in 1975 the kind of pro-investor policies now in place, it could well have earned hundreds of millions more each year from oil and gas exports during the early 1980s when prices were so high. Similarly, if Bolivia had put in place in 1975 more sensible investment and macroeconomic policy, it could have had a vibrant mining and legal agricultural sector by 1985. The coca boom brought undeniable short-term benefits in the period 1975-1985, but it only postponed the day of reckoning by permitting the government to stumble on. In the end, the adjustment had to be brutal precisely because Bolivia's export industries had been allowed to decay during the years of dawdling. Had the adjustment started sooner, it would not have had to be so deep.

II. Prospects for Bolivian Growth in the 1990s

Bolivia went through a dramatic cocaine boom in the decade up to 1988/89. This section asks what is likely to provide the engine for Bolivian growth in the 1990s: cocaine or the legal economy? The first three sections look at the cocaine industry: its recent record, the prospects for demand world-wide, and the growth avenues for the Bolivian cocaine industry in the 1990s. The next two sections look at the legal economy: the prospects for

Bolivia as a whole and the specific outlook for Chapare agriculture.

A. Bolivia Coca/cocaine Income 1987-91

The Bolivian coca/cocaine industry has not done well in recent years. The World Bank estimates that Bolivia's coca/cocaine income was \$1,100 million in 1987, \$670 million in 1989, and \$320 million in 1991.³⁷ Again according to the World Bank, Bolivia's coca/cocaine exports went from \$470 million in 1988 to \$240 million in 1990. (USAID La Paz estimates that coca/cocaine income and exports at lower levels than those reported by the World Bank; it also estimates a decline from 1988 through 1992)³⁸

According to the World Bank, in 1987, at the height of the coca boom and near the bottom of the slump in the legal economy, coca/cocaine was 26 percent of Bolivia's legal GDP. In 1991, coca/cocaine was 6% of legal GDP -- a drop of 20 percentage points! Again according to the World Bank, coca/cocaine exports were equal to 68 percent of legal exports in 1988, and that is counting legal exports of both goods and services. In 1990, coca/cocaine was equal to 25 percent of Bolivia's legal exports according to the World Bank -- a decline of 43 percentage points!

The ratio fell because the coca numerator shrank and the legal economy denominator grew. In particular, according to the World Bank, the legal GDP went from \$4.2 billion in 1987 to \$5.3 billion in 1991, while legal exports went from \$670 million in 1988 to \$975 million in 1990 (both had shrunk in the preceding four years). For GDP, one fourth of the decline in the coca/cocaine ratio was due to the growth of the legal economy; for exports, one half was due to legal growth.

We can add together the estimated coca/cocaine figures and the legal GDP and exports figures, though there are some conceptual differences in how the numbers are figured which make the data on legal and illegal activity not strictly comparable. The sum of legal GDP plus coca/cocaine income went from \$5.3 billion in 1987 to \$5.6 billion in 1991. The sum of legal exports and coca/cocaine exports went from \$1.140 billion in 1987 to \$1.215 billion in 1991.

One element in the reduced coca/cocaine income is that the volume of coca leaf produced appears to have stagnated. After years of rapid increase, harvestable leaf increased

a mere 1.5 percent over the three years 1988-1991.³⁹ The area planted to coca has fallen during the same period, thanks to the GOB's compensated voluntary eradication campaign.
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The more important reason for the decline in coca/cocaine income is a drop in price. Price data are hard to get, given the illegal nature of most of the industry. Bolivia has excellent price data for the quality of coca leaf destined for chewing, which is after all a legal product.⁴¹ However, the recorded prices are only for chewable leaf; the vast bulk of leaf is of lower quality, suitable only for making into cocaine. That leaf is sold by farmers to intermediaries outside the markets. The prices received by farmers for this coca is sharply lower than the price for chewable coca. Law enforcement and Bolivian officials interviewed suggest that the differential may be about one-third but can vary considerably.

Despite the difference between chewable and "cocaine pit" coca, the price of chewable coca is the best proxy available for the "cocaine pit" coca. The price varies a great deal at different times. Between July 1986 and June 1992, the average monthly price in three markets in the Chapare varied from a low of \$10 per 100 pound *carga* to \$117. But over time, there has been a clear trend towards lower leaf price. A trend line through the price data shows that on average from June 1986 through June 1992, the price of a 100 pound *carga* fell each year by \$7.20 (the equivalent of an annual price drop of \$.159 per kilogram). The attractiveness of coca as a product depends not only upon the price but also on the volatility of the price. Surges in law enforcement can temporarily reduce the price and that price volatility makes farmers reluctant to depend on coca for their daily bread. Jones describes the process:⁴²

Close surveillance in the Chapare, and raids on processing facilities there (and elsewhere), are indeed disruptive and do contribute to local price volatility... Extreme price volatility at the farm level over the short term is alone a strong deterrent to coca production; the Chapare farmer interviews reveal this quite clearly... Because of these price swings, many farmers in the Chapare are agonizing over whether to eradicate their coca... A common strategy seems to be to eradicate a part of one's coca plants.

Perhaps prematurely, the New York Times editorialized on May 7, 1991 about "From Bolivia Good News on Drugs,"

The market of raw coca leaves [has collapsed.] The price for 100 pounds of raw leaves, more than \$60 last summer, fell below \$20, considerably less than the cost of production.... Washington professes to recognize that the Andean strategy depends on both military and economic aid. The collapse of coca prices in Bolivia vindicates that approach, and sooner than experts had dared to hope.

Unfortunately, price developments were less positive in late 1991 and 1992. The decline in prices stopped: there has been essentially no trend in prices since early 1991. Furthermore, prices have been less variable from July 1991 to June 1992 than earlier. The standard deviation of the monthly price per carga fell to \$10, from \$15 in 1990/91 and \$24 in 1989/90. The fall was sharper when expressed as a percent of the mean: 26% in 1991/92, 38% in 1990/91, and 75% in 1989/90. As Ken Beasley has written, "It is in the interest of processors and traffickers to encourage coca leaf farmers. Stable, attractive prices could be important vehicles for doing this." The evidence is consistent with the interpretation that traffickers may be learning to smooth price, though I have no confirmation that this is so. Whatever the reason for the development, it is troubling.

Lower coca leaf prices will eventually lead to lower coca production: that is what is predicted both by economic theory and by coca farmers themselves.⁴³ To date, the principal effect appears to have been to slow planting of new coca bushes. If the International Narcotics Control Strategy Report data on cultivated area and the Bolivian government eradication data are accurate, plantings have fallen close to zero in 1991 and 1992.⁴⁴

However, it is still profitable to harvest the existing bushes. Coca grows on bushes, the planting of which represents a significant capital investment for the farmer. It will remain difficult to persuade farmers to abandon cultivation once they have made a major expenditure on planting; dissuading new plantings is easier. But if current trends continue, then over time, the existing bushes will age and few replacements will be planted, so output will fall. Were there no new plantings, output would fall each year by the same absolute amount (some 6 percent to 10 percent of its current level), which would be a larger percentage each year of the constantly declining base, until in about twelve years output would be close to zero. More rapid reductions would come only if farmers could be persuaded to tear up or abandon existing plants.

B. The Prospects for World-Wide Cocaine Demand

There is good reason to expect that the growth prospects for cocaine demand are poor in the 1990s. Certainly the historic pattern is that illicit drugs go in and out of fashion. David Musto has described the first cocaine epidemic, which began after cocaine hydrochloride became available in cheap and pure form around 1885. At first, Sigmund Freud sang the praises of the new wonder potion, which was not controlled by any law; it was consumed in many forms, including the new drink, Coca-Cola. "The first epidemic lasted from 1885 until the 1920s, about 35 years. There were three stages: an initial euphoria about an apparently harmless, indeed, a valuable and helpful stimulant; a middle period of dispersion and multiplying instances of prolonged use; and, finally, a powerful rejection of cocaine as its popular image became as negative as it had once been positive."⁴⁵

The pattern Musto describes seems to be repeating itself in part. The development of free base and crack has made cocaine available to lower-income users. Mark Kleiman observes, "As cocaine became associated with unwed teenage mothers rather than with rock stars and yuppie greed-heads, it grew less fashionable. [At the same time,] the quantity consumed per user also rose, as compulsive binge users came to constitute a larger and larger proportion of the total user population."⁴⁶ Information about U.S. cocaine consumption is so sketchy as to make any conclusions hazardous. The best reading of the available information is that there has been a dramatic reduction in the number of casual users of cocaine (those who use cocaine at least once a month but less than once a week). The National Household Survey on Drug Abuse reports that the number of casual users fell from a peak of 5.1 million in 1985 to 1.0 million in 1990, though the swing may be exaggerated because it was once fashionable to have claimed to have used cocaine whereas it is generally now popular to deny use (The number of casual users rose to 1.3 million in 1991, but that is within the wide margin of error).⁴⁷ However, the hard core of frequent users appears not to have budged from around .6 million reported in the NHSDA plus other groups not in "households," especially those in and out of jails.⁴⁸ This hard core appears to consume the vast bulk of the cocaine used in the U.S.

The net result is that the volume of cocaine consumed in the U.S. may have changed

little though the number of users dropped significantly. Due to the heavy users, the demand for cocaine is high and is likely to remain so. But due to the smaller number of casual users, there may be fewer potential recruits to the heavy user category, so demand may not grow. Reinforcing that trend is what may be a growth in heroin fashionability, especially since more new and more powerful varieties of heroin facilitate consumption through snorting and smoking (needles, in the AIDS epoch, are a marketing nightmare).⁴⁹ There has been some scattered evidence to support this speculation.

Cocaine demand in markets outside the U.S. is likely to grow. For several years, law enforcement officials have worried that cocaine consumption in Europe and Asia could explode similar to the U.S. experience in the late 1970s. West European seizures rose 125 percent from 1989 to 1991. However, the absolute amount consumed in those markets is much smaller than in the U.S. A high rate of growth outside the U.S. plus a small decline in the U.S. could translate into flat world demand.

The most likely prospect is that substantial growth in the volume of coca demanded seems unlikely in the 1990s; cocaine will probably be a slow-growth industry with uncertain price prospects.

C. Growth through Cocaine in the 1990s?

Even though the cocaine industry may be relatively stagnant world-wide, the question remains whether the Bolivian industry could grow. There are four possible avenues for such growth.

First would be through increasing share of the leaf market at the expense of Peru. Beasley (USAID La Paz) has written that the evidence from U.S. embassy cables suggest "Bolivia is significantly lower cost producer of coca products at all stages of processing than Peru, and accordingly this cost advantage can be expected to encourage and consolidate Bolivia's competitiveness, relative to Peru, as a source of supply."⁵⁰ However, this conclusion relates only to the cost of production, not to the cost of transport. If planes from the Chapare have to make an additional landing (for refueling) compared to those from the Huallaga Valley, and if Riviera's informants are correct that each landing requires bribes of \$2,000-\$3,000,⁵¹ then the production cost differential can be offset by higher transport cost

which could be \$10 per carga. Furthermore, any cost differential in Bolivia's favor could disappear if security conditions in Peru deteriorate and Sendero takes effective control over the Huallaga. Given its past policies, it seems likely that Sendero would keep Peruvian coca leaf prices competitive in order to increase their income from the crop.

Second would be through agronomic improvements that make the industry more profitable. This could well happen. Some coca farmers speak about yields as high as four tons per hectare, whereas some years ago, two tons per hectare was cited as a good yield.

⁵² There may be potential to increase the cocaine content of leaves: only scattered information is available on the average cocaine content, though agronomic research suggests this can vary by a factor of ten to one depending upon the species, cultivar, season, and other conditions. Another way to increase profitability is to reduce the time from planting to first harvest. If the interval from seedling ("plantula") transplant to first harvest is on the order of 15 months,⁵³ then the internal rate of return is about 100%, whereas if the period is reduced to 9 months, the internal rate of return rises to about 300%, according to the rate of return model developed by Clark Joel for USAID La Paz.

Third, Bolivians could become more involved in processing coca leaves into cocaine. The old pattern was for paste to be made in Chapare, base in clandestine labs elsewhere in Bolivia, and hydrochloride in Colombia. That is changing. Now, nearly all the paste is converted into base in Chapare by farmers and/or small-time operators. Of the base, 60% is exported, either to Colombia or more recently some to remote parts of Brazil; 40% is converted into hydrochloride in Bolivia. The laboratories found in Bolivia have been steadily becoming more sophisticated, with the recycling of inputs becoming an advanced art.

Fourth, there has been considerable speculation about the prospect for Bolivian nationals increasing income from cocaine by moving more actively into processing and smuggling. In fact, there is already considerable Bolivian presence downstream, and such presence is not new. It is worth remembering that the Santa Cruz drug lords in the early 1980s appeared to be establishing important distribution channels in the U.S., and indeed as recently as August 1992, Jorge Roca Suarez appeared to still be running a large scale drug smuggling operation from his Los Angeles jail cell, according to U.S. Customs.⁵⁴ At the same time, the Bolivian traffickers appear to cooperate closely with the Colombian cartels

(mostly Cali, though Medellin is resurfacing), which provide sophisticated technology and marketing expertise.⁵⁵ It is unclear how much scope there is for increasing Bolivian income through by-passing the Colombians, though there has been considerable speculation that this will occur in European markets.

Overall, it would seem that there are some ways in which the Bolivian coca/cocaine industry could increase income in the 1990s, despite possible stagnation in world-wide cocaine demand. We cannot declare that the days of high coca/cocaine income are definitely over. While we should be cautious, nevertheless the record of recent years offers good reason to think that the Bolivian coca/cocaine industry will not thrive in the 1990s.

D. Growth Prospects for Bolivia's Legal Economy

Bolivia's recent economic development and its prospects are better than may be realized. In his August 6, 1992 speech to Congress, President Paz Zamora, predicted 1992 inflation of 11% (14.5% 1991), a budget deficit 2.8% (3.6% in 1991), and -- despite floods that hit agriculture hard -- real GDP growth of 3.5% (4.1% in 1991).

Bolivia's program is vigorously endorsed by international agencies. It "has successfully undergone one of the most dramatic stabilization programs in recent times," said Dennis de Tray, Chief of World Bank's Country Operations Division for Bolivia/Colombia/Dominican Republic.⁵⁶ The adjustment effort has not yet been matched by GDP growth, which was 2.6.% per annum on average in 1986-90 and 4.1% in 1991, in part because private investment averaged 2% of GDP in 1986-90. Investment has picked up in 1991-92, but not by as much as might have been hoped from the substantial macroeconomic adjustment. Raising investment requires "three elements: restoring investor confidence, increasing private sector investment opportunities for mining and hydrocarbons, and strengthening basic infrastructure and human resource development."

De Tray noted that investors still lack confidence "about the Bolivian Government's ability to see its adjustment program through to the end." Interviews with US and Bolivian officials in La Paz found the same judgement. The private sector is not sufficiently impressed by the stability of the last few years to make major investments; it wants more progress on structural reform. The most important reason why investor confidence is low is

that the politicians are deeply split about policy. Investors worry that the government could reverse direction, especially after the 1993 election.

What are the probably engines for growth in Bolivia in the 1990s? The growth sectors could include:

Mining. The Financial Times reported on April 16, 1992, "Excited mining analysts and businessmen claim that the country is on the threshold of a boom the like of which it has not seen since the days of the tin barons of the 19th century. A timely combination of pro-business legislation and important discoveries have attracted a swarm of international mining groups." It noted that Bolivia "has established what is said to be the most pro-business tax regime in South America;" the new mining and foreign investment laws of 1991 "put Bolivia back on the world mining map." It is quite possible that foreign investment in the mining sector may reach \$100 million a year, equal to 30% of all private investment in the entire economy in 1990.

Oil and Gas. While 24 oil firms were active in Bolivia in the 1970s, oil nationalism led most to leave. Yacimientos Petroliferos Fiscales Bolivianos (YPFB) could not fill the gap especially under poor management, and crude output fell from 49,000 barrels per day in 1973 to 18,000 in 1987. Now, with new laws, foreign firms are returning. Under contracts signed in 1990-91, Exxon is to spend \$1 million per annum on exploration; Chevron, \$2.5 million; Santa Fe \$3-10 million; with additional amounts from Texaco and Phillips.

Non-traditional exports. Non-traditional export products went from a 1988 base of \$108 million to \$292 million in 1991 ⁵⁷ (1992 exports are not forecast to grow as quickly because of record floods in the east). The major growth was in sugar, soya, cattle, and wood, that is, products from the lowlands near Santa Cruz, approximately 200 kilometers from the Chapare region. This boom -- \$150 million in two years, 1989-91 -- in alternative products, combined with the stagnation in coca, suggests that coca is a mature or declining industry; growth will come from new crops. Alternative agricultural development may not be a theoretical option for Bolivia: it may be a reality already underway.

E. The Future of Chapare Agriculture

Most efforts for alternative development have concentrated on finding a single magic

crop or a mix of crops to substitute for coca cultivation in the Chapare. Identifying high-value crops that could be produced in the coca-growing regions is not necessarily a useful exercise. For one thing, crop substitution programs could lead simply to the displacement of coca to another region, if no solution is found for the basic problem of inadequate income for the exploding population in the traditional Andean farming regions. Furthermore, for at least three reasons, the best approach for those regions may in fact be encouraging emigration. First, alternative development in the Chapare runs the risk of being "parallel development" of cocaine plus legal crops. Chapare farmers will always have the temptation of growing coca, which is an argument for favoring the development of other regions. Second, it may be possible to help the people now living in the Chapare without creating jobs there. As discussed above, much of the labor in the Chapare is from seasonal migrants who be happy to go to other regions. This group, the poorest in the Chapare, can be helped by an expansion of the national economy that creates good income jobs, even if those jobs are not in the Chapare. Third, development of the Chapare may be unwise since the region is ecologically fragile and isolated.

That said, there may be legal crops that could provide a competitive income. In his study for USAID La Paz, Clark Joel's estimate of potential for legal development, using the conservative figures of IBTA on area that could be planted to each of eight crops in a program for diversified development, was, "The total area currently and potentially devoted to the eight crops is 43,200 ha, yielding an income (or net output) to the economy of \$48.8 million [compared to Planning Minister Doria Medina's \$57 million for coca leaf in all Bolivia]. The total number of jobs provided is estimated at 29,100 (full-time equivalent employment, including family labor)." The total capital/credit requirement of \$45.7 million could be almost matched by \$43 million in compensation payments at \$2,000 ha on half of the coca area.⁵⁸

Bolivia: Internal Rate of Return from Chapare Agriculture, 1992
(in percent)

Coca		310
Papaya		273
Pineapple		114
Bananas		92
Palm hearts		75
Citrus	38	
Black pepper	31	
Macadamia		29
Hogs		14
Passion fruit		not meaningful (59% cash flow in first two years)

Note: Passion fruit produces an income in the first year that exceeds the cost of investment, so it is not possible to calculate an internal rate of return.

Source: Clark Joel, "Alternative Development for the Chapare," USAID La Paz, July 1992.

To be sure, Joel notes that all of the calculations use the current prices and "it cannot be assumed that these prices will continue to prevail regardless of the output that will be forthcoming over the next several years." But the strategy is for diversified development, to avoid the problems of monoculture including vulnerability to changes in price and flooding the market. Initially, the relevant market is Cochabamba and Santa Cruz, where the demand has proved excellent for the new products from the Chapare.⁵⁹ For instance, the local market has snapped up the Chapare pineapples, which are much better quality than those from Yungas which had previously dominated the market. But there are good prospects in exports markets, especially in northern Argentina.

The barriers to developing legal agriculture include: (i) the attractiveness of coca leaf, which has a much higher rate of return at present prices, costs and technologies; (ii) the vicious circle "which causes potential investors in processing and marketing facilities to abstain from investment because there is no production, while potential producers refrain from producing because there are no processing facilities;"⁶⁰ and (iii) some lack of action

by the government, especially the failure to provide all-weather paved roads from the Chapare to either Cochabamba or Santa Cruz.

III. Concluding Remarks

Those who would argue that the cocaine industry is a major benefit to the Bolivian economy have got a major problem to explain: coca/cocaine income fell two-thirds from 1987 to 1991 (according to the World Bank), but the economy does not appear to have collapsed. Quite the contrary, legal GDP expanded from \$4.2 billion in 1987 to \$5.3 billion in 1991. The sum of legal GDP plus coca/cocaine income went from \$5.3 billion in 1987 to \$5.6 billion in 1991. In other words, the empirical evidence is not consistent with the theory that Bolivia's economy would collapse without coca/cocaine. The evidence is, however, consistent with the theory presented here that coca/cocaine is of dubious benefit and can be readily replaced by legal economic activity.

As Planning Minister Doria Medina argued in an interview, the cocaine problem was closely linked to Bolivia's macroeconomic difficulties: illegal export industries flourish in times of economic disorder. Now that stability has been restored, the cocaine industry is shrinking, both absolutely and relative to the legal economy. He is optimistic that the problem, while remaining, is on the road to resolution.

Planning Minister Doria Medina has identified the essential strategy for resolving the cocaine problem: creation of enough good-income employment that growing cocaine is not attractive. Interdiction and eradication are important tactics, and they are necessary for containing the problem in the short run. But winning a war requires good strategy as well as good tactics: no matter how valiant the frontline troops, the war will be lost if the generals worry only about the tanks coming over the hill and forget that their basic job is to disrupt the enemy and prevent his reserves from ever reaching the front. The point of the analogy is that if we only interdict and eradicate, then we will be refighting the battle every day until the end of time, whereas if we supplement interdiction and eradication with the creation of good-income jobs, then within ten years, we could be in a situation in which underemployment in Bolivia is low and incomes for the unskilled in the legal economy are competitive with coca incomes. Of course, law enforcement must be part of the anti-cocaine

strategy, for without eradication and interdiction, the price gap between coca leaf and cocaine for the consumer will narrow, which could mean both much higher prices for farmers and much lower prices for consumers.⁶¹

If the heart of the anti-narcotics strategy is creating good-income jobs, then the arteries that keep the blood pumping is economic reform. That reform can only be driven by the genuine conviction of the Bolivian; it cannot be imposed from abroad. But if that conviction exists -- and it certainly seems to -- then ESF aid can play a key role. ESF addresses the problem that benefits from reform come after a few years, while the costs are immediate. Plus the benefits of reform are spread over the population while the costs are concentrated on certain groups which are therefore sure to protest. Balance-of-payments aid can help smooth the way by reducing the short-term costs and by expediting the benefits.

A paradox: one of the most important positive benefits of cocaine has been \$200 million a year in U.S. aid to Bolivia, which otherwise might get only \$15 million per annum.⁶² That paradox has to be faced head-on by making clear to Bolivians that the aim of USAID is to work itself out of a job: to create self-sustaining growth which leads the country to become developed. The best solution to the cocaine problem is to make Bolivia rich enough that the income from coca is not attractive.

And a final warning: If cocaine disappeared from Bolivia, that would at first depress national income. Before long, the disappearance of the cocaine industry may cause a growth in other industries that would make up for much, if not all, of the lost cocaine income. However, those who now work in the cocaine industry would certainly be losers for at least some years. To be sure, they would not sit idle for long; after an initial dislocation, they would do something else for a living. Nevertheless, it is not plausible to suggest to those in the coca/cocaine industry that they lose from the industry. Bolivian society may be the loser, but those in the industry are not.

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Notes

1. Alberto Rivera P., Diagnostico Socio-Economico de la Poblacion del Chapare, Cochabamba: PDAR, April 1990. See Note 5 below on population estimates.
2. James Jones, Farmer Perspectives on the Economics and Sociology of Coca Production in the Chapare, Institute for Development Anthropology Working Paper No. 77, January 1991, page 61.
3. Cf. the Jones and Rivera studies cited above.
4. The Economist, August 17, 1991. However, the majority around Santa Cruz is culturally different from the valley and highland population: it is non-Quechua and regarded as more aggressive in business and social dealings. Jones describes the strong tension between the lowlanders ("cambas") and highlanders ("kollas").
5. A 1988 USAID survey estimated the population at 208,224, which was on the low side. Jones cites a variety of surveys for 1985-88, including one dubious one claiming 600,000. As to the population pre-boom, Jones, who did extensive field work, estimates the 1976 population at 110,000, while Rivera points out the 1976 census implies a much smaller population. The 1967 census found 25,000 residents.
6. The Rural Household Survey found 11,000 households in the coca-growing regions; using the average household size of 4.76, that implies about 50,000 residents. However, it is not clear if the coverage of migrants was as thorough as in the Jones and Rivera data, nor if the survey reached the communities newly established in isolated regions to avoid the authorities. The 1992 census shows similar results and may similarly not include many of the migrants. The UMOPAR evaluation of continuing population decline was in La Presencia, April 14, 1992.
7. Rivera, op. cit., pp 5, 20, and 48-9.
8. Jones, James. Farmer Perspectives on the Economics and Sociology of Coca Production in the Chapare. Institute for Development Anthropology Working Paper No. 77, January 1991, pp 6 and 43.
9. Riviera, op. cit., pp 41-44.
10. Jones, James. Farmer Perspectives on the Economics and Sociology of Coca Production in the Chapare. Institute for Development Anthropology Working Paper No. 77, January 1991, pp 8-9.
11. Ibid., p 46.
12. Interview with Jose Salinas Castro, Subsecretary for Alternative Development, Ministry of Agriculture and Farmer Aid.

13. Oscar Antezana, USAID memo, March 27, 1991.
14. Though it could be argued that Bolivia is a high-cost agriculture producer, it is still efficient to grow most foods domestically. The same rugged mountains that force growing food on marginal land also create high transport costs that make food imports expensive.
15. Interview with Samuel Doria Medina.
16. La Economía de la Coca en Bolivia: Plaga o Salvación?, Muller & Asociados, Informe Confidencial, June 1991, No. 64., p 8. The analysis was by Jeffrey Franks, "our associate."
17. Interview with Minister of Planning and Economic Co-ordination Samuel Doria Medina.
18. Interview with Samuel Doria Medina.
19. Mario de Franco and Ricardo Godoy, "The Economic Consequences of Cocaine Production in Bolivia," Harvard Institute for International Development, June 1990, pp 20-21.
20. Though to be fair, it must be acknowledged that some parts of the cocaine industry are less import intensive than others. In particular, the production of coca leaf has extensive linkages with the rest of the economy; it uses many domestically produced inputs, like simple agricultural implements and simple chemicals.
21. Where governments have proved incompetent at managing economic policy, dollarization may be a positive development. But it would be hard to argue that has been the case in Bolivia since 1985, when the government has followed policies that limited inflation, kept the exchange rate realistic, and promoted credit to the private sector.
22. The calculations are as follows. Were dollarization to end completely, the \$250 million in dollar bills now in Bolivia would be exchanged for bolivianos. Those dollar bills would eventually end up in banks (exchange dealers would probably buy them at first, but the dealers would either deposit them in banks or sell them to larger capitalists who would). The \$250 million in the banks would be equal to 80% of the existing \$300 million foreign exchange reserves held by banks. Or, if the banks decided not to increase their reserves, the banks would use the money to finance additional loans. In that case, the \$250 million would permit loans to the private sector to increase from their base of \$1,600 billion.
23. Eduardo Gamarra, "Bolivia," International Handbook on Drug Control edited by Scott MacDonald and Bruce Zagaris, Westport: Greenwood Press, 1992, p 106.
24. There is no reason to think that these funds came from cocaine profits. After all, the rise in Bolivian bank deposits came at a time when cocaine profits were depressed. Plus, anecdotal evidence suggests that those who make the most profit from cocaine -- the traffickers -- hold most of their funds abroad.

25. Interview with Marion (Tex) Ford, USAID Cochabamba. Mr. Ford worked in the region 1966-72 and 1990 to present.
26. The income from coca leaf sales is estimated by the respected Bolivian economic firm Muller y Asociados at about \$60 million income. The surveys conducted by Jones and Rivera, cited below, suggest the population in the Chapare is about 100,000 people, while the 1991 Census data suggest a lower population. Assuming 5 per family, that makes a coca income per family of \$3,000. In fact, many of the families do not raise coca (e.g., merchants), and the coca-raising families have income from their food crops. But \$3,000 is an order-of-magnitude estimate.
27. Rivera P., op. cit., p 16 and, on poor social indicators, p 79-80..
28. Jones, op. cit., p 43.
29. Jones, op. cit., p 22 and, on health problems, p 43.
30. Jones, op. cit., p 19 for both quotes.
31. Rivera P., op. cit., p 14..
32. Interview with Sonya Aranibar, USAID La Paz.
33. Examples from Jorge Gutierrez Andrade, PDAR Cochabamba.
34. "Comienzan a proliferar en Bolivia los servicios privados de seguridad," Presencia, April 2, 1992.
35. Narcotics: The Environmental Consequences.
36. In addition to the chemical pollution, coca may contribute to deforestation. Coca is frequently planted in fields cleared from forests; the same U.S. government study refers to 40,000 hectares of forest cut in the Chapare since the mid-1980s. However, it is not clear if coca development is much different in this regard than is other development.
37. Bolivia: Updating Economic Memorandum, October 8, 1992.
38. USAID La Paz estimates value added in the coca/cocaine industry fell from \$425 million in 1988 to \$245 million in 1992, while exports fell from \$454 million to \$279 million in the same period.
39. International Narcotics Strategy Report 1992, p 97; the increase was from 77,245 metric tons to 78,400. In the 1989 and 1990, output was somewhat lower than in either end year.

40. According to the International Narcotics Control Strategy Report 1992, harvestable coca area in 1991 was 2 percent less than in 1988 (area rose some in 1989 and fell in 1990 and 1991). Other estimates are more optimistic: the New York Times (March 13, 1992) reported that the coca area had fallen 15 percent in three years.
41. The leaf in the Chapare is sold in regional markets, to which farmers themselves bring the leaf for sale at a freely determined price. DIRECO maintains detailed records on the prices in the markets.
42. Jones, op. cit., pp 15 and 41.
43. The Rivera and Jones surveys and the AID personnel working in the Chapare cited below all report comments by farmers to this effect.
44. Thanks to Ken Beasley, USAID La Paz, for pointing this out.
45. David Musto, Wall Street Journal, [date to be inserted].
46. Mark Kleiman, Against Excess: Drug Policy for Results, New York: Basic Books, 1992, p 301.
47. The data are reported generally as the number who used cocaine in the last month and the number who used cocaine in the last week. That can be confusing. The number who used cocaine in the last month includes both regular users (those who use cocaine each week) and casual users (those who use cocaine less than once a week but more than once a month). The number of casual users can be calculated by subtracting from those who used cocaine in the last month the number who used cocaine in the last week.
48. For a complete survey of the problems in determining use from existing U.S. government data, see Office of National Drug Control Policy, "What America's Users Spend on Illegal Drugs," June 1991.
49. Among others, Congressman Charles Schumer (D-NY), Chairman of the House Judiciary Committee Subcommittee on Crime and Criminal Justice, has criticized the Administration for ignoring a coming heroin epidemic ("The Andean Initiative: Squeezing a Balloon," February 25, 1992).
50. Beasley, Kenneth. "Comparison of Estimation Assumptions for Measuring the Economic Impact of the Coca Sub-Economy in Peru and Bolivia," Memorandum, USAID La Paz, July 22, 1992.
51. "Hasta hace un tiempo, los informantes señalan que se pagaba 'cobertura' de \$10-15,000 a los leopardos de UMOPAR para 4 o 5 vuelos de avionetas de transporte." Rivera P., Alberto. Diagnóstico Socio-Económico de la Población del Chapare. Cochabamba: PDAR, April 1990.

page 37.

52. Jorge Gutierrez Andrade, PDAR, Cochabamba.
53. As appears to be assumed in the cost calculations in PDAR, "Costos de Operación: Guía Para 9 Cultivos," (Cochabamba, July, 1991) using data from DIRECO.
54. Gamarra, op. cit., pp 105-106 and Ultima Hora, August 25, 1992.
55. Interview with Robert Johnston, DEA La Paz.
56. IMF seminar on Bolivia's economy reported on in IMF Survey, April 27, 1992.
57. Muller y asociados, Estadísticas económicas 1991, p 222, for all exports other than hydrocarbons and minerals. For 1991, "Exportaciones no tradicionales se estancaron en gestión pasada," Presencia, January 12, 1992. The data for the late 1980s (but not 1991) overstate exports some because of an export premium.
58. Joel, Clark. "Alternative Development of the Chapare." June 9, 1992 (mimeograph, USAID La Paz).
59. Interviews with Charles Hash, USAID La Paz, and Marion Ford, USAID Cochabamba.
60. Joel, Clark. "Alternative Development of the Chapare." June 9, 1992 (mimeograph, USAID La Paz). page 28.
61. Another way of stating the same point is that law enforcement is needed to make drug trafficking expensive (the trafficking costs are the gap between producer and consumer prices). In the absence of effective law enforcement, drug trafficking is so profitable that the income it produces is so high that the business is attractive even in highly industrialized nations like the U.S. There is no realistic economic prospect for eliminating drug trafficking in the Andes through economic development unless vigorous law enforcement makes trafficking expensive.
62. Rough estimate by Ken Beasley, USAID La Paz.