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**BOLIVIA'S COCA
SUB-ECONOMY IN 1992:
A COMPUTER MODEL**



USAID/BOLIVIA

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INTRODUCTION

The model shown in table 4 estimates the economic impact of coca and coca derivatives in the Bolivian economy. It calculates production, exports, value added and employment in the coca sub-economy.

The model interrelates all variables through formulas for automatic calculation. It is fed through the "control variables table" (table 3) and through changes in tables 5-8 which contain production costs at all stages of the coca industry.

Since there is a paucity of reliable data for the coca sub-economy, the model makes quite a few assumptions. Therefore, for the most part, the model estimates ranges. Still, it can only provide an order of magnitude of the importance and impact of the coca sub-economy on the Bolivian economy.

The estimates show that total direct value added of the coca sub-economy declined from \$425 million in 1988, representing 3.1% of GDP, to \$199 million in 1992, or 3.1% of GDP (see graph 1 in section V). Similarly, the amount retained in country is estimated to have declined from \$279 million, or 5.3% of GDP, to \$97 million, about 1.5% of GDP, during the same period (see graph 2 in section V). The export value followed similar trend. It declined from \$454 million in 1988, representing about 84% of merchandise exports, to \$232 million in 1992, or about 38% of exports (see graph 3 in section V). These declining trends are believed to be the result of 1) declining prices of coca leaf (see graph 4 in section V) and the other coca derivatives, and 2) more effective interdiction.

Finally, it is estimated that while farm income derived from labor and profit was about \$63 million in 1992, the four family clans of narcotraffickers believed to have been operating during 1992 may have earned in profit alone some \$110 million.

The first section of the present report contains the summary of results. The second section outlines the assumptions and is followed by the "control variable table". The fourth section presents the entire model with its appendix. The last section presents a few graphs that show the relative importance of the coca sub-economy in Bolivia and the world.

I. SUMMARY OF RESULTS

TABLE 1

The estimated coca leaf production market value for illicit purposes of about US\$ 66 million in 1992 represents 6%, approximately, of Bolivia's agricultural sector value added (see graph 5 in section V). Bolivia's production volume of coca leaf of about 77,200 MT represents 23%, approximately, of total world production (see graph 6 in section V).

The net value added of the process stages (coca paste, coca base and hydrochloride) is estimated at about \$135 million, representing about 18% of the manufacturing sector value added (see graph 7 in section V). The country's estimated net production of cocaine of 92 MT for 1992, represents about 9% of the world's total, and contributes in the form of exported base, an additional 9% that is likely to be processed in Colombia (see graph 8 in section V).

While the estimated net value added of the coca sub-economy was \$199 million, representing 3.1% of GDP (see graph 1 in section V), the amount retained in country is estimated at \$97 million, or 1.5% of GDP (see graph 2 in section V). The total income effect of this retained amount of about \$180 million is equivalent to 2.8% of GDP.

The export value of the coca sub-economy in 1992 is estimated at US\$232 million (about 38% of legitimate merchandise exports).

TABLE 1	
SUMMARY OF RESULTS BOLIVIA'S COCA SUB-ECONOMY	
Description	1992 (projected)
Coca Leaf Production for Illicit Processing:	
Gross Production (MT)	77,204
Seized Production (MT)	189
Net Production market value (mill of US\$)	66
Net value added (mill of US\$)	63
Exports (mill of US\$)	0
Coca Paste Production:	
Gross Production (MT)	791
Seized Production (MT)	5.1
Net Production market value (mill of US\$)	64
Net value added (mill of US\$)	(19)
Exports (mill of US\$)	0
Coca Base Production:	
Gross Production (MT)	253
Seized Production (MT)	40
Net Production market value (mill of US\$)	96
Net value added (mill of US\$)	20
Exports (mill of US\$)	48
Cocaine Hydrochloride Production:	
Gross Production (MT)	93
Seized Production (MT)	0.7
Net Production market value (mill of US\$)	184
Net value added (mill of US\$)	134
Exports (mill of US\$)	184
TOTAL ILLICIT PRODUCTION:	
Production market value (mill of US\$)	410
Net value added (mill of US\$)	198
Net value added as a % of GDP	3.1
Net value added retained in country (mill of US\$)	97
Net value added retained in country as a % of GDP	1.5
Total income effect (mill of US\$)	180
Total income effect as a % of GDP	2.8
Exports (mill of US\$)	232
Exports as a % of total legitimate exports	38
TOTAL DIRECT EMPLOYMENT (in thousands)	105

II. ASSUMPTIONS

TABLE 2

Although most of the data is based on information gathered mainly by the DEA or NAS in La Paz, they are treated as assumptions due to their relatively low accuracy and reliability. Assumptions for the percentages of income and exports generated by the industry and retained in country, and the income and employment multipliers, are even more speculative.

TABLE 2

SUMMARY TABLE OF BASIC ASSUMPTIONS	
	1992
<u>Hectares</u>	
Number of hectares under cultivation	46,200
Less acreage devoted to production for legal consumption	12,989
Total estimated hectares with immature (not producing) plants	3,800
<u>Prices</u>	
Coca Leaf (\$ per 100 lbs.)	41
Paste (\$ per kilo)	67-95
Base (\$ per kilo)	400-500
Hydrochloride (\$ per kilo)	1500-2500
<u>Conversion Factors</u>	
Coca Yield (MT per Ha)*	2.625
Leaf to Paste (per kilo of paste)	92.5
Paste to Base (per kilo of base)	2.8
Base to Hydrochloride (per kilo of HCL)	1.15
Allowance for coca leaf spoilage	5%
Assumed illegal consumption of paste of total paste production	10%
Base exported as a % of total base production	50%
<u>% Total Direct Valued Added Remaining in Country at Each Stage of Production</u>	
Coca Leaf	100%
Paste	100%
Base	60%
Hydrochloride	30%
<u>Income Multiplier at Each Stage of Production</u>	
Coca Leaf	2.2
Paste	1.5
Base	1.4
Hydrochloride	1.3
<u>Employment</u>	
Number of families in Chapare	38,000
Direct Employment	
Average number of working members per family	2.7
Employment Multiplier	1.6

*A weighted yield of 2.7 MT/Ha in the Chapare and 1.0 MT/ha in Yungas.

III. CONTROL VARIABLES

TABLE 3

This is the "control" table that contains the exogenous variables to the model. Since the "model" (shown on the next page) includes only formulas that interrelate all of the variables, changes or updates of information (e.g., prices of coca leaf and derivatives, conversion factors) is done in this table, which automatically feeds into the model.

TABLE 3

CONTROL VARIABLES OF THE MODEL		
<u>COCA LEAF STAGE</u>		
Total estimated area under cultivation (Has)		46,200
Less:		
Area devoted to production for legal domestic consumption (Has)		12,989
Total estimated area with immature (not producing) plants (Has)		3,800
Average yield (MT/Ha/Yr)		2.625
Allowance for spoilage at the coca leaf stage		5%
Amount of coca leaves seized (MT)		189
Price per "carga" (US\$)	41 to	41
<u>COCA PASTE STAGE</u>		
Conversion factor from coca leaf to coca paste (Kg)		92.5
Kgs. of coca paste seized		332
Kgs. of "agua rica" paste equivalent seized		4,740
Price of paste per Kg (US\$)	67 to	95
Assumed % of coca paste for illegal domestic consumption		10%
<u>COCA BASE STAGE</u>		
Conversion factor from coca paste to coca base (Kg)		2.8
Kgs. of coca base seized		7,706
Kgs. of "agua rica" base equivalent seized		31,828
Price of base per Kg (US\$)	400 to	500
Value of base exported		50%
<u>COCAINE HYDROCHLORIDE STAGE</u>		
Conversion factor from coca base to hydrochloride (Kg)		1.15
Kgs. of hydrochloride seized		696
Price of HCL per Kg (US\$)	1,500 to	2,500

TABLE 3 (pg.2, cont.)

Legitimate Merchandise Exports (mill US\$)	609
Gross Domestic Product (mill US\$)	6,469
Percentage of:	<u>Exports</u> <u>Value Added</u>
Coca Leaf	100% 100%
Coca Paste	100% 100%
Coca Base	60% 60%
Cocaine Hydrochloride	30% 30%
	Remaining in Country
Income multipliers at each stage:	
Coca Leaf	2.2
Coca Paste	1.5
Coca Base	1.4
Cocaine Hydrochloride	1.3
<u>EMPLOYMENT</u>	
Number of farm families:	38,000
Average number of members in working age per family:	2.7
Direct employment in process stages	2,000
Employment multiplier	1.6
Total Legitimate Employment (mill)	2,266

IV. THE MODEL

TABLE 4

This is the main model which contains formulas exclusively. All variables are interrelated so that a change of data through the "control variable table" (table 3) automatically recalculates all values.

The model, in turn, is also fed by tables 5 through 8 which contain production costs of all stages of the coca industry. Changes in the values of these tables will also feed into the model for automatic update.

TABLE 4

**ESTIMATES OF ECONOMIC IMPACT OF
COCA AND DERIVATIVES IN 1992: VALUE OF
PRODUCTION, EXPORTS, VALUE ADDED AND EMPLOYMENT**

01/14/93

I. AREA UNDER CULTIVATION AND ESTIMATED PRODUCTION OF COCA LEAVES:

Total estimated area under cultivation in 1992 (Has.)	46,200
Less:	
Area devoted to production for legal domestic consumption (Has.)	12,989
Total estimated area with immature (not producing) plants (Has.)	<u>3,800</u>
TOTAL AVAILABLE ILLEGAL PRODUCTION	29,411 (1)
Average yield (tons/Ha/Yr) based on 28,100 Ha at 2.7MT/ha. in Chapare and 1,311 Ha at 1MT/ha. illegally produced in Apolo (Yungas)	2.625 (2)
TOTAL PRODUCTION OF COCA LEAVES	77,204 tons

II. VALUE OF PRODUCTION AND EXPORTS:**1. Value of Coca Leaves Available for Processing into Paste:**

Amount:	77,204
Less allowance for spoilage: 5%	<u>3,880</u>
Net production of coca leaves	73,344 tons
Less	
Amount of coca leaves seized	189 tons
Net production of coca leaves available for further processing	73,155 tons

Price per "carga" in US\$ 41 to 41 (Average price for the year, see Graph 1)
Price per kilo in US\$ 0.904 to 0.904

TOTAL PRODUCTION VALUE OF COCA LEAVES:

73,154,881	Kg. x	0.904 =	US\$ 66,131,832 to
73,154,881	Kg. x	0.904 =	US\$ 66,131,832

Exports: 0

2. Value of Coca Paste Production (Pasta Humeda):

Assume: 92.5 kilos of coca leaves yield 1 kilo of paste

73,154,881	Kg. of leaves divided by	92.5 =	790,861 Kg. of paste produced
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Minus: 332 kilos of coca paste seized
 4,740 kilos of "agua rica" paste equivalent seized

Net production of coca paste available for further processing: **785,789 Kg.**

Price of paste in US\$ 67 to 95 per kilo.

VALUE OF PASTE PRODUCED:	785,789	Kg. of paste x US\$	67	US\$ 52,647,863 to
	785,789	Kg. of paste x US\$	95	US\$ 74,649,955

Assumed used for domestic consumption: 10%

Available for conversion into base: 90% or 707,210 Kg.

Exports: 0

(1) 28,100 Has. under production in the Chapare, 1,311 Has. under illegal production in Yungas.

(2) A weighted yield of 2.7 MT/Ha in the Chapare and 1.0 MT/Ha in the nontraditional zone of Yungas.

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TABLE 4 (pg.2, cont.)

3. Value of Coca Base (Oxido Base) Produced and Exported:

Assume: 2.8 kilos of paste to produce 1 kilo of base
 707,210 Kg. of paste divided by 2.8 = 252,575 Kg. of base produced

Minus: 7,706 kilos of coca base seized
 31,828 kilos of "agua rica" base equivalent seized

Net production of coca base available for further processing: 213,041 Kg.

Price of base in US\$ 400 to 500 per kilo.

VALUE OF BASE PRODUCED: 213,041 Kg. x US\$ 400 = US\$ 85,216,414 to
 213,041 Kg. x US\$ 500 = US\$ 106,520,518

Percentage of Base exported: 50%

VALUE OF BASE EXPORTED: US\$ 85,216,414 x 0.5 = US\$ 42,608,207 to
 US\$ 106,520,518 x 0.5 = US\$ 53,260,259

4. Value of Hydrochloride Produced and Exported:

Assume: 1.15 kilos of base to produce 1 kilo of hydrochloride

Amount of base available for conversion into hydrochloride:

213,041 Kg. x 0.5 = 106,521 Kg. of base divided by 1.15 = 92,827 Kg. of HCL produced

Minus: 696 kilos of hydrochloride seized

Net production of coca base available for further processing: 91,931 Kg.

Assumed price of hydrochloride in US\$: 1,500 to 2,500 per kilo.

VALUE OF HYDROCHLORIDE PRODUCED: 91,931 Kg. x US\$ 1,500 = US\$ 137,896,500 to
 91,931 Kg. x US\$ 2,500 = US\$ 229,827,500

VALUE OF HYDROCHLORIDE EXPORTED: US\$ 137,896,500 to
 US\$ 229,827,500

5. Total Value of Production and Export:

Production Stages	(In millions of US\$)							
	Total Produced		Total Seized		Exported		Converted	
	to		to		to		to	
Coca Leaves	66	66	0.2	0.2	0	0	66	66
Coca Paste	53	75	0.3	0.5	0	0	47	67
Coca Base	85	107	15.8	19.8	43	53	27	33
Hydrochloride	138	230	1.0	1.7	138	230	0	0

RECAPITULATION: TOTAL VALUE OF EXPORTS: (In millions of US\$)

Of Coca Base 43 to 53
 Of Hydrochloride 138 to 230
 181 to 283

TABLE 4 (pg.3, cont.)

6. Coca Exports as a Percentage of Legitimate Merchandise Exports:			
Low Estimate:	US\$	$\frac{181}{609} \times 100 =$	29.6%
	US\$		
High Estimate:	US\$	$\frac{283}{609} \times 100 =$	46.5%
	US\$		
Mid-point Average:	US\$	$\frac{232}{609} \times 100 =$	38.1%
	US\$		
III. VALUE ADDED BY COCA AND DERIVATIVES (or contribution to informal GDP):			
A. DIRECT EFFECTS:			(in US\$)
1. Value Added by Coca Leaf Production:			
Total Coca Leaf Production Value:			66 million to 66 million
Less:			
Cost of agricultural inputs (e.g. fertilizers, insecticides): (See Table 5 for detailed calculations)			94 per Ha/Yr
			Equal: 3 million
Equal: TOTAL NET VALUE ADDED OF COCA LEAVES:			63 million to 63 million
2. Value Added by Coca Paste Production:			
Total Coca Paste Production Value:			53 million to 75 million
Less:			
Coca Leaf Production Value (previous stage):			66 million to 66 million
Cost of precursors: US\$ 20 per kilo of coca paste= (See Table 6 for detailed calculations)			16 million
Equal: TOTAL NET VALUE ADDED OF COCA PASTE:			(30)million to (8)million
3. Value Added by Coca Base Production:			
Total Coca Base Production Value:			85 million to 107 million
Less:			
Coca Paste Production Value (previous stage):			53 million to 75 million
Cost of precursors: US\$ 50 per kilo of coca base. (See Table 7 for detailed calculations)			13 million
Equal: TOTAL NET VALUE ADDED OF COCA BASE:			20 million to 19 million
4. Value Added by Hydrochloride Production:			
Total Hydrochloride Production Value:			136 million to 230 million
Less:			
Cost of coca base (previous stage) used into the processing of HCL:			43 million to 53 million
Cost of precursors: 1% of total base production value (See Table 8 for detailed calculations)			2 million
Equal: TOTAL NET VALUE ADDED OF HYDROCHLORIDE:			93 million to 175 million
5. Total Direct Value Added:			
			Lower estimate: 147 million to
			Upper estimate: 250 million

TABLE 4 (pg.4, cont.)

6. Total Direct Value Added as a % of GDP:						
Low Estimate:	147 million x 100 =	6,469			2.3%	
High Estimate:	250 million x 100 =	6,469			3.9%	
Mid-point Average:	199 million x 100 =	6,469			3.1%	
B. VALUE ADDED RETAINED IN COUNTRY:						
(in mill of US\$)						
Production Stages	Net Direct Value Added		% Retained in Country (1)	Net Direct Value Added Remaining in Country		
	to			to		
Coca Leaves	63	63	100% of all labor and profit	63	63	
Coca Paste	(30)	(8)	100% of all labor and losses	(30)	(8)	
Coca Base	20	19	60% of labor and profit	12	12	
Hydrochloride	93	175	30% 100% of labor and	28	52	
TOTAL	147	250	30% of profit	74	120	
(1) See Table 9 for details on labor costs and profit.						
Direct Value Added Retained in Country as a % of GDP:						
Low Estimate:	74 million x 100 =	6,469			1.1%	
High Estimate:	120 million x 100 =	6,469			1.9%	
Mid-point Average:	97 million x 100 =	6,469			1.5%	
C. INDIRECT EFFECTS:						
Assumed income multipliers:						
(in mill of US\$)						
Production Stages	Total Value Remaining in Country (1)		Income Multiplier (2)	Total Income Effect (3)		Indirect Effect (4) = (3) - (1)
	to			to		
1. Coca Leaf Production	63	63	2.20	139	139	76
2. Coca Paste Production	-30	-8	1.50	-44	-11	-15
3. Coca Base Production	12	12	1.40	17	16	5
4. Hydrochloride Production	28	52	1.30	36	68	8
TOTAL	74	120		148	212	74
RECAPITULATION: DIRECT PLUS INDIRECT INCOME EFFECTS						
Total Direct:	74	to	120 million			
Total Indirect:	74	to	93 million			
Total Income Effect:	148	to	212 million			
D. ESTIMATED INCOME GENERATED BY NARCOTICS INDUSTRY IN THE CHAPARE AS A % OF LEGITIMATE 1992 GDP						
Low Estimate:	148 million x 100 =	6,469			2.3%	
High Estimate:	212 million x 100 =	6,469			3.3%	
Mid-point Average:	180 million x 100 =	6,469			2.8%	

TABLE 4 (pg.5, cont.)

IV. EMPLOYMENT GENERATION: (in coca production for export)			
A. DIRECT EMPLOYMENT			
Currently in Chapare: about	38,000 farm families		
Average number of workers per family:	2.7		
Direct Employment in the Production of Coca Leaf:		102,600 workers	
Direct Employment in Process Stages:		2,000 workers	
TOTAL DIRECT EMPLOYMENT:		104,600 workers	
B. DIRECT PLUS INDIRECT EMPLOYMENT:			
Assuming an employment multiplier of:	1.6		
	104,600	x	1.6 =
			167,360 workers
C. ESTIMATED DIRECT AND INDIRECT EMPLOYMENT IN NARCOTICS AS A % OF TOTAL LEGITIMATE EMPLOYMENT			
Total Legitimate Employment:	2,266,000		
	$\frac{167,360}{2,266,000} \times 100$	=	7.4%
	(3)		
(3) This is an estimate for 1992 based on official data of the total employed population in 1989, the last year for which such information is available.			

IV.A. APPENDIX TO THE MODEL

TABLE 5

PRODUCTION COSTS AT THE COCA LEAF STAGE			
	Quantity	Price per Unit	Total (US\$/Ha)
<u>Investment (excl. land)</u>			
Land Preparation (M/D)	40	3	120
Equipment (various)	0	—	418
Coca Seeds (qq)	4	12	48
Dig Holes (M/D)	30	3	90
Transplanting (M/D)	25	3	75
TOTAL			751
Divided by 8 Yrs. (1)			93.9 Ha/Yr
Multiplied by the number of Has. cultivated			29,411 Has
Equal:		US\$	2.76 million
<u>Labor Costs</u>			
Hand Weed	48	3	144
Fumigation	24	3	72
Agroch. Application (M/D)	70	3	210
Harvesting (M/D)	135	3	405
TOTAL			831 Ha/Yr
Multiplied by the number of Has. cultivated			29,411 Has
Equal:		US\$	24.44 million
	Amount/ Ha/Yr	Unit Price (US\$)	Total/ Ha/Yr (US\$)
<u>Agrochemicals</u>			
Fertilizers (Its)	1	15.0	15
Herbicides (Its)	3	7.7	23
Insecticides (Its)	4	24.0	96
TOTAL			134
Percentage of farmers using chemicals			70%
Weighted cost of chemicals per Ha/Yr			93.87 per Ha/Yr
Multiplied by the number of Has. cultivated			29,411 Has
Equal:		US\$	2.76 million

(M/D) = Man/Day

(1) Since it is believed that the older coca plantations have been eradicated, it is assumed that the existing plantations are no more than 8 years old.

Source: Based on "Alternative Development of the Chapare", a report undertaken for USAID/Bolivia, Clark Joel, June 9, 1992.

TABLE 6

VARIABLE COSTS IN THE PROCESSING OF COCA PASTE			
	Amount/ 500 lbs. of Processing or per 2.45Kg of Paste	Unit Price (US\$)	Total (US\$)
Precursors			
Gasoline/Kerosene	25 lts.	0.44	11
Sulfuric Acid	3 Kgs.	5.33	16
Sodium Carbonate	0.5 Kgs.	8.00	4
Lime	25 lbs.	0.36	9
Ammonia	200 cc.	45.00	9
Toilet Paper	1 roll	1.00	1
Total			50
Total/Kg.			20
Multiplied by the number of Kg. of paste produced			785,789 Kgs
Equal:		US\$	16.03 million
Labor Costs			
Leaf Stompers	4	6.75	27
Lab Operator	1	9.00	9
Transporter	1	9.00	9
Property Lease	1	4.00	4
Food	6	2.00	12
Total			61
Total/Kg.			25
Multiplied by the number of Kg. of paste produced			785,789 Kgs
Equal:		US\$	19.56 million

Source: Based on DIRECO figures.

TABLE 7

VARIABLE COSTS IN THE PROCESSING OF COCA PASTE			
	Amount/ per Kg of Coca Base Processed	Unit Price (US\$)	Total (US\$)
Precursors			
Sulphuric Acid	30 grs.	0.07	2
Bicarbonate	15 grs.	0.13	2
Potassium			
Permanganate	100 grs.	0.05	5
Ammonia	1 lt.	36.00	36
Bag	1	1.00	1
Toilet Paper	4 rolls	1.00	4
Total			50
Multiplied by the number of Kg. of base produced			252,575 Kgs
Equal:		US\$	12.63 million
Labor Costs/Kg of Base			
Multiplied by the number of Kg. of base produced			252,575 Kgs
Equal:		US\$	4.55 million

Source: Based on DIRECO figures.

TABLE 8

VARIABLE COSTS IN THE PROCESSING OF HYDROCHLORIDE (1)		
<u>Precursors</u>	(in US\$)	
1% on the production value of hydrochloride		1.84 million
	1%	
<u>Labor Costs</u>	(in US\$)	
1/2% on the production value of hydrochloride		0.92 million

(1) Due to lack of data, percentage figures are only assumptions.

TABLE 9

COMPONENTS OF THE VALUED ADDED IN EACH STAGE (1)				
	Net Value Added (US\$ mill)	Imported Inputs (US\$ mill)	Labor Costs (US\$ mill)	Profit (US\$ mill)
Coca Leaves	63	3	24	39
Coca Paste	-19	16	20	-38
Coca Base	20	13	5	15
Hydrochloride	134	2	1	133
TOTAL	199	33	49	149

(1) Mid-points of ranges are used in the calculations.

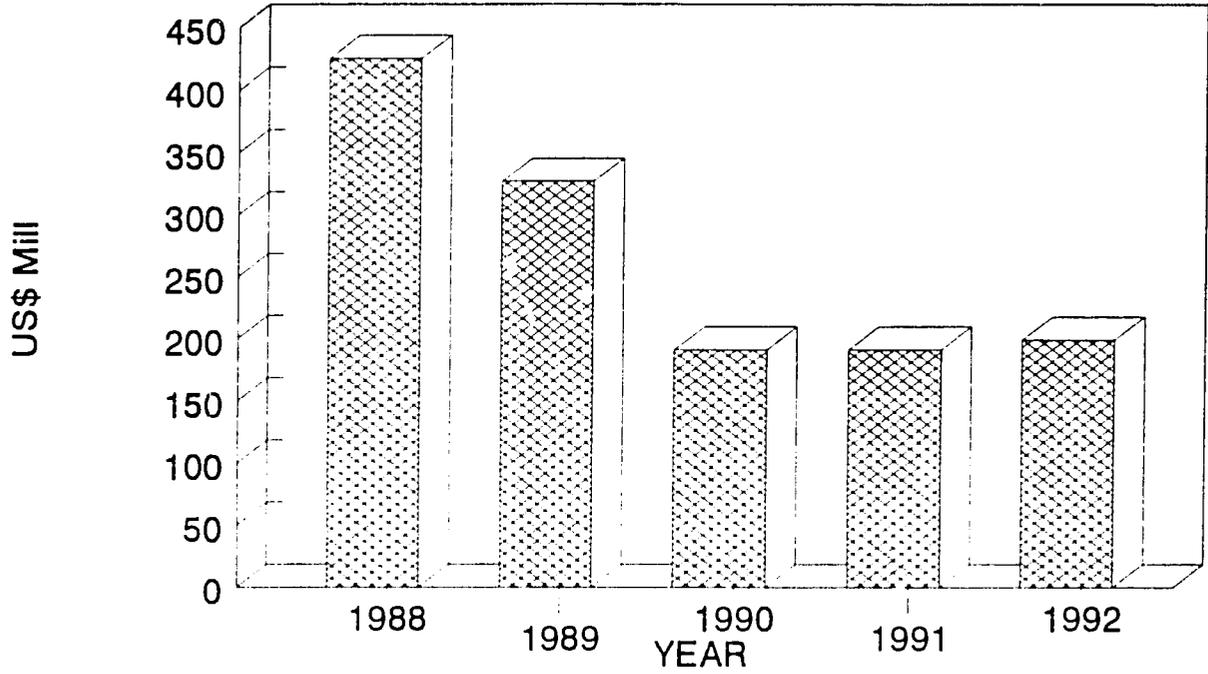
TABLE 10

PER CAPITA INCOME			
LABOR			
	Income Derived from Labor (US\$ mill)	Number of Workers (000)	(US\$)
<u>Stages</u>			
Coca Leaf	24	103	238
Other	25	2	12,515
PROFIT			
	Profit (US\$ mill)	Number of "Capitalists"(1)	(US\$)
<u>Stages</u>			
Coca Leaf	39	103	379
Coca Paste & Coca Base	-23	?	?
Hydrochloride (mill)	133	4	33.29

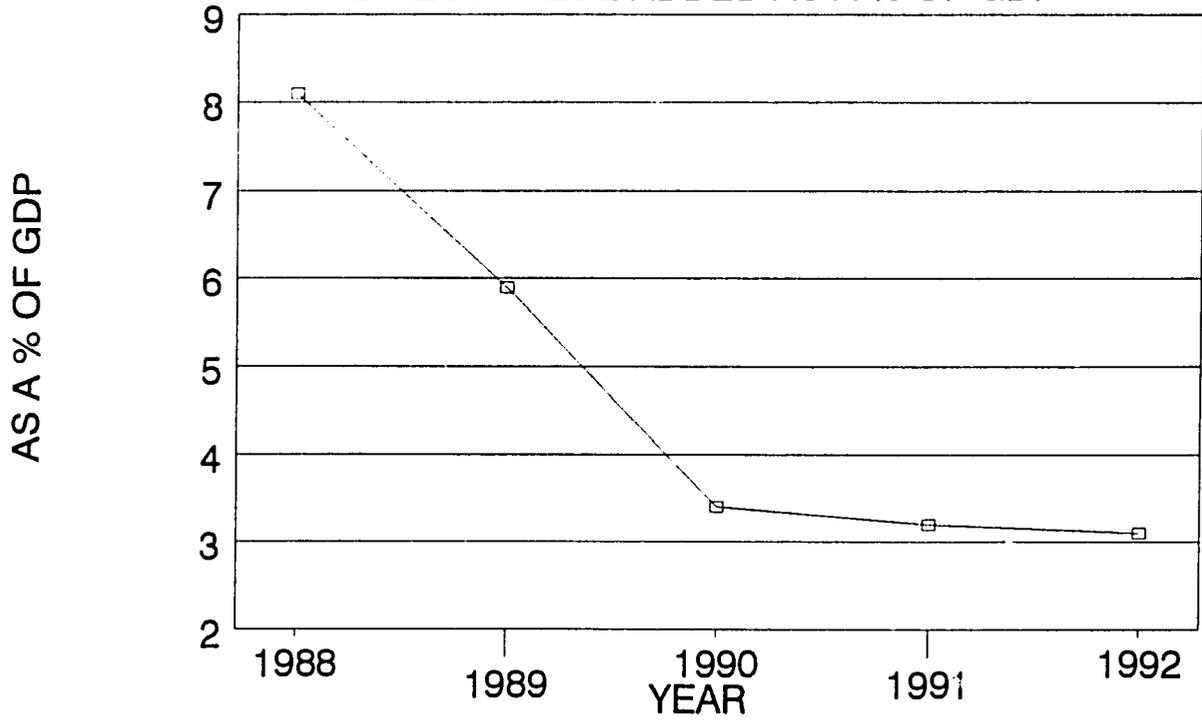
(1) As estimated by the DEA, 4 family clans of narcotraffickers have been operating in Bolivia during 1992.

**V. THE IMPORTANCE OF THE COCA
SUB-ECONOMY
IN BOLIVIA AND THE WORLD**

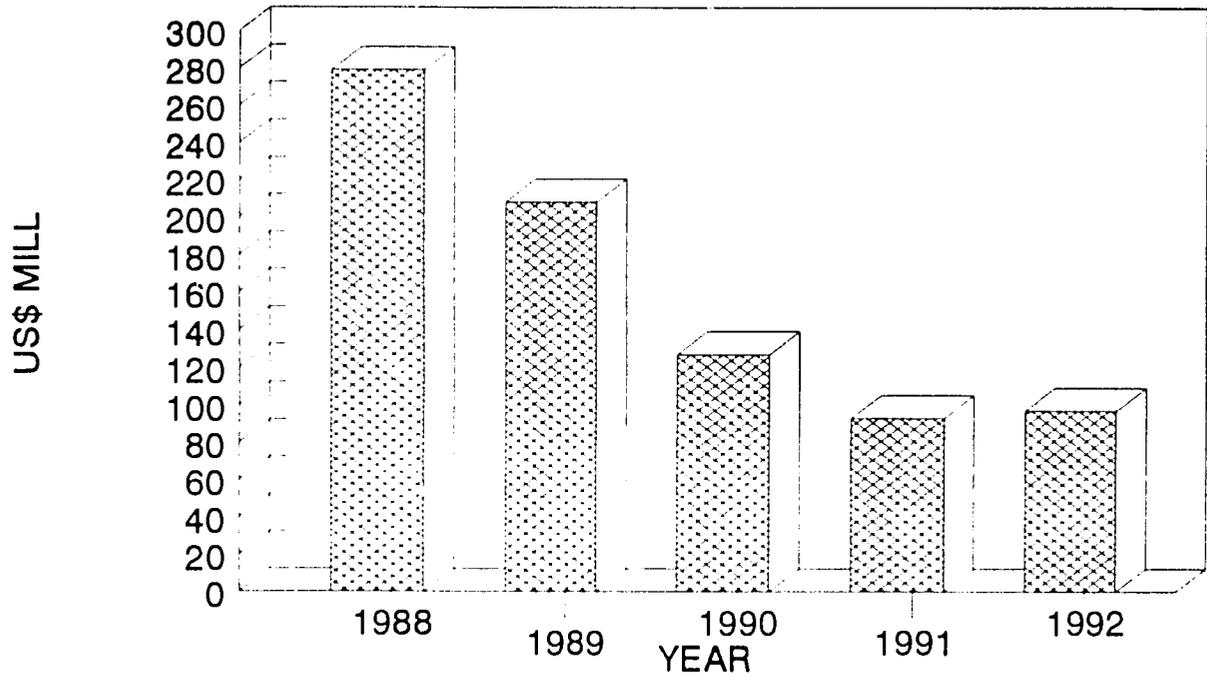
GRAPH 1
DIRECT VALUE ADDED (US\$Mill)



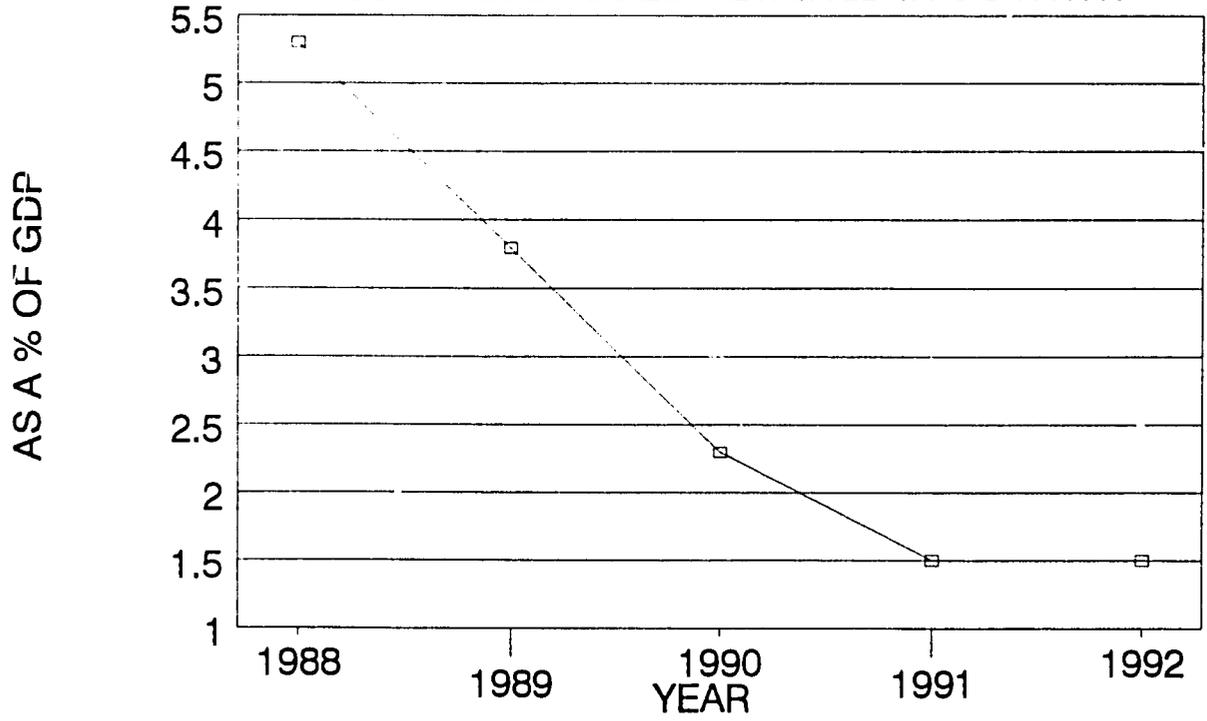
GRAPH 1A
DIRECT VALUE ADDED AS A % OF GDP



GRAPH 2
DIRECT VALUE ADDED RETAINED IN COUNTRY

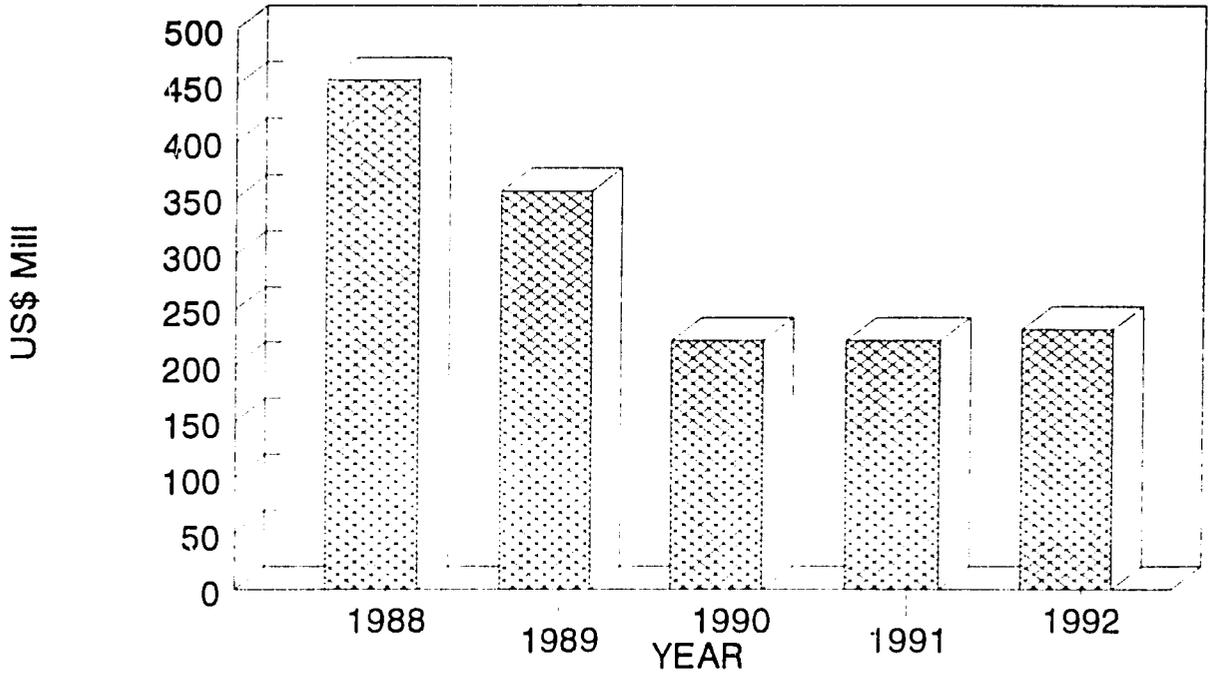


GRAPH 2A
DIRECT VALUE ADDED RETAINED IN COUNTRY

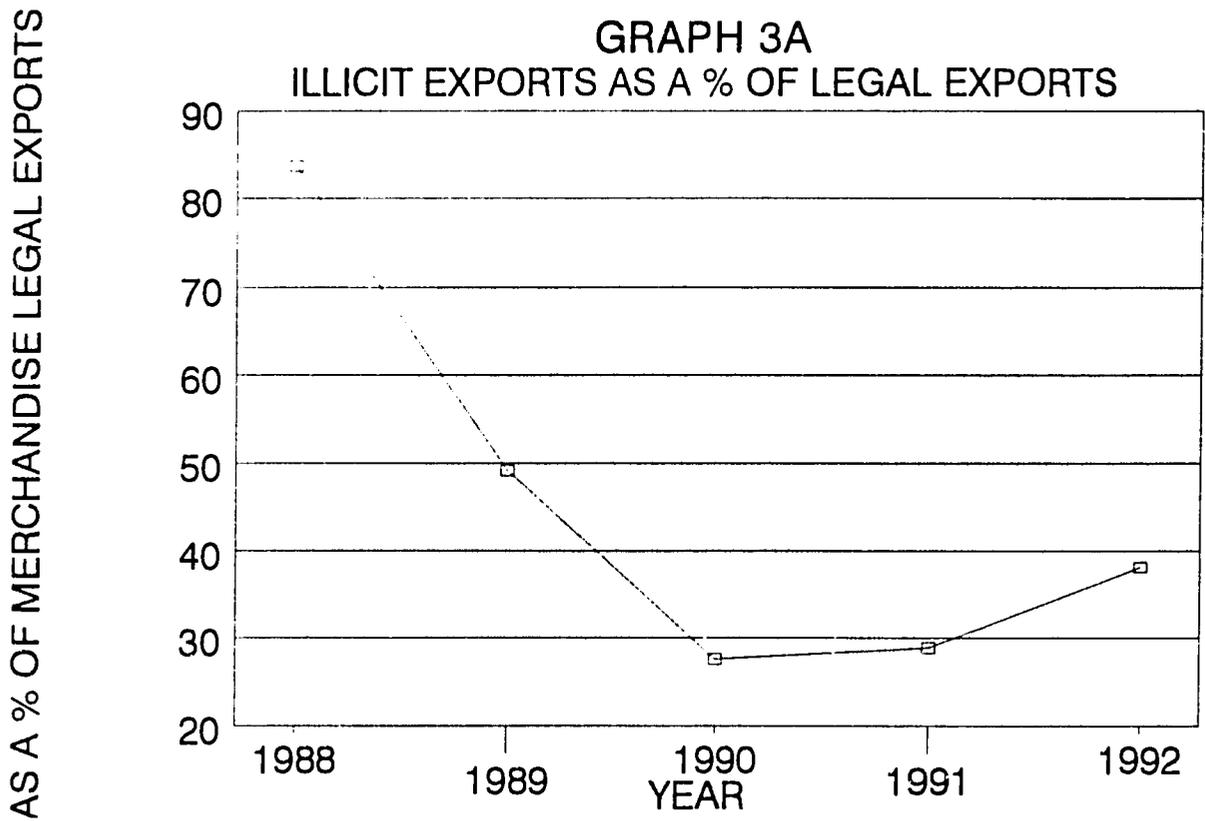


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GRAPH 3
COCA-COCAINE EXPORTS (US\$ Mill)

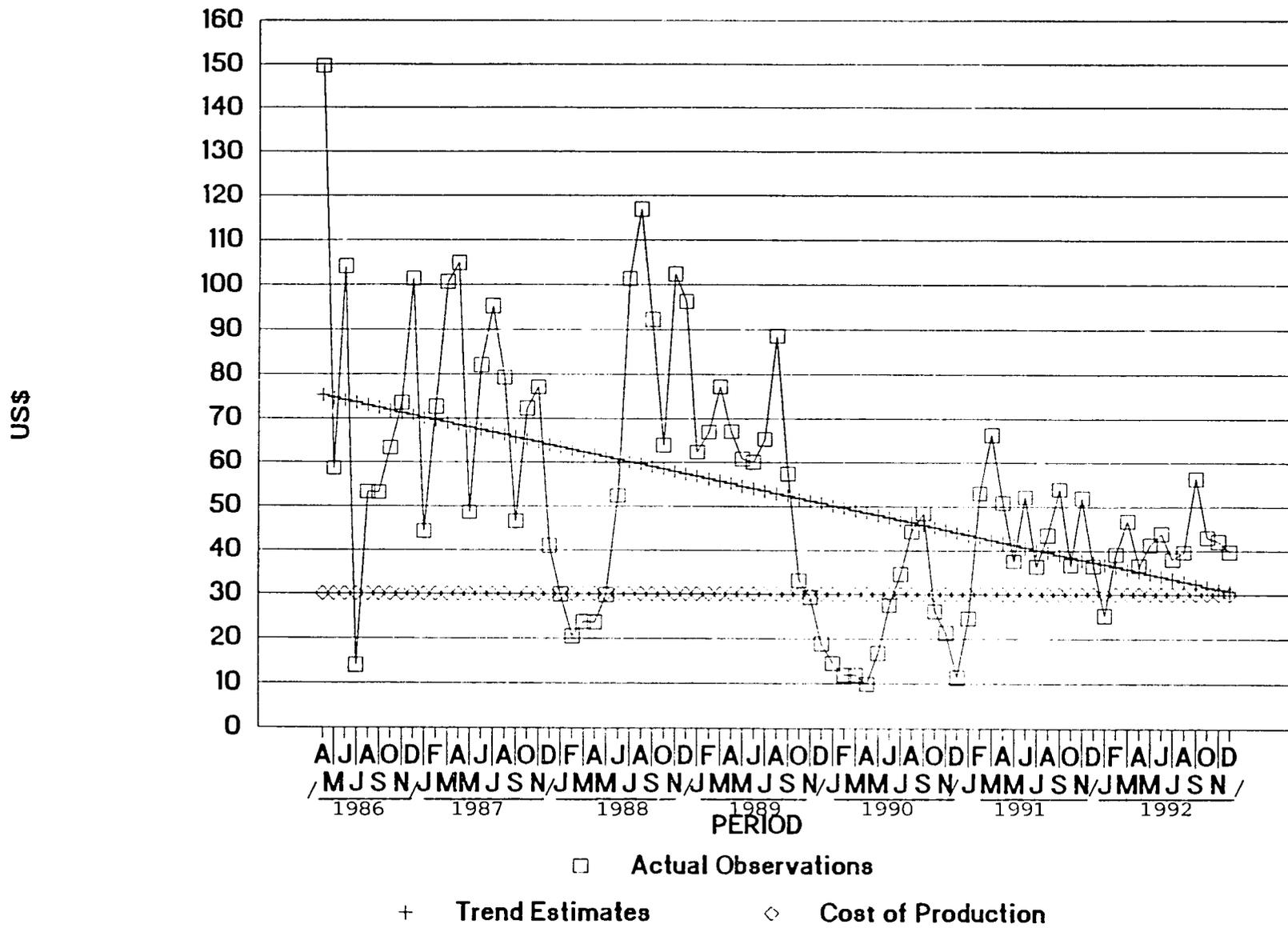


GRAPH 3A
ILLICIT EXPORTS AS A % OF LEGAL EXPORTS

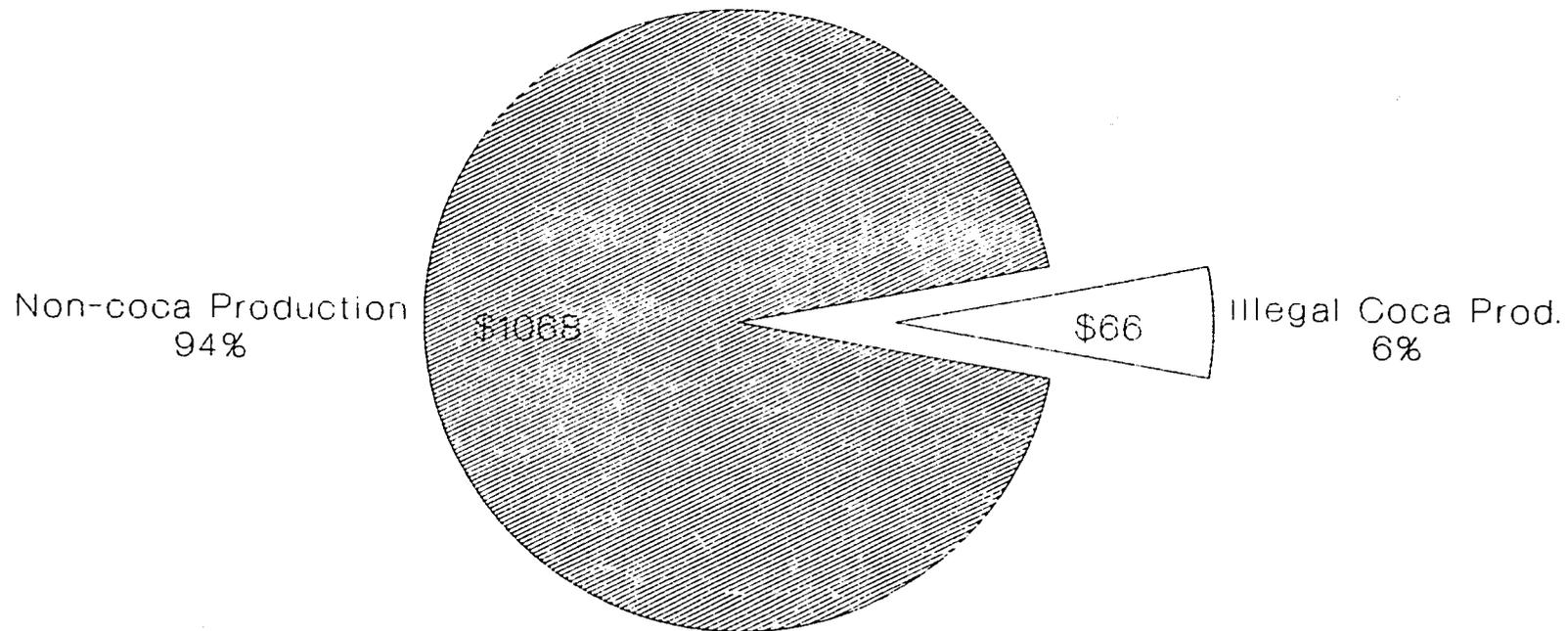


GRAPH 4

COCA PRICES AND THEIR TREND

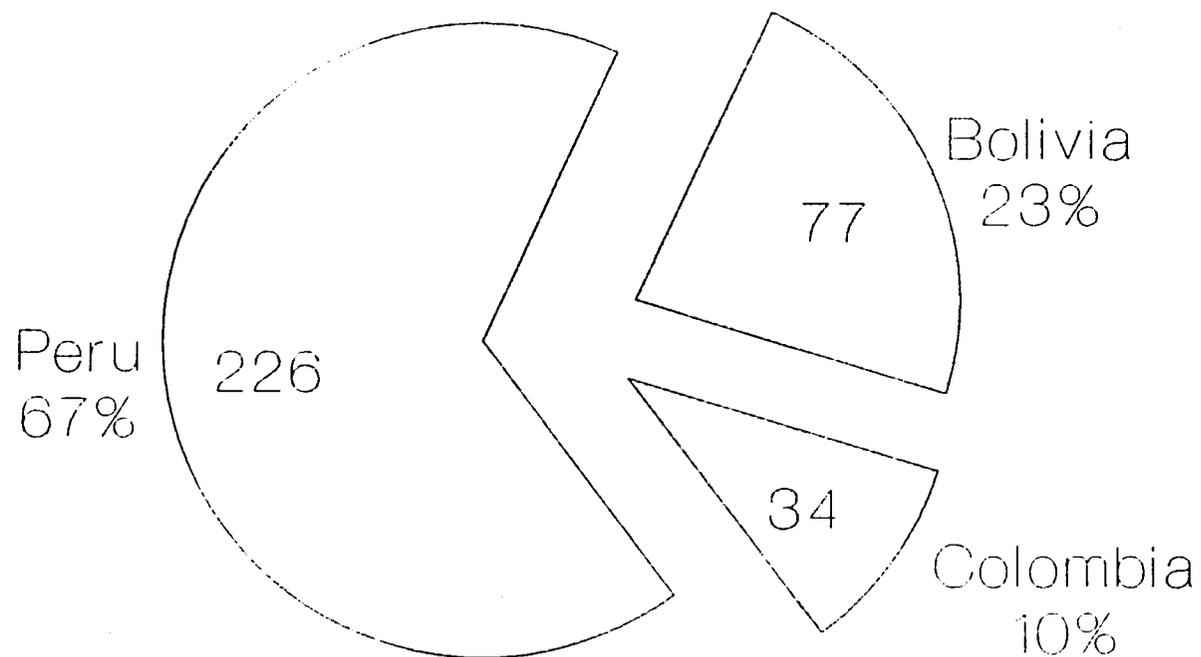


Bolivia's Agricultural Sector: 1992 Coca vs. Non-coca (Mill. of US\$)



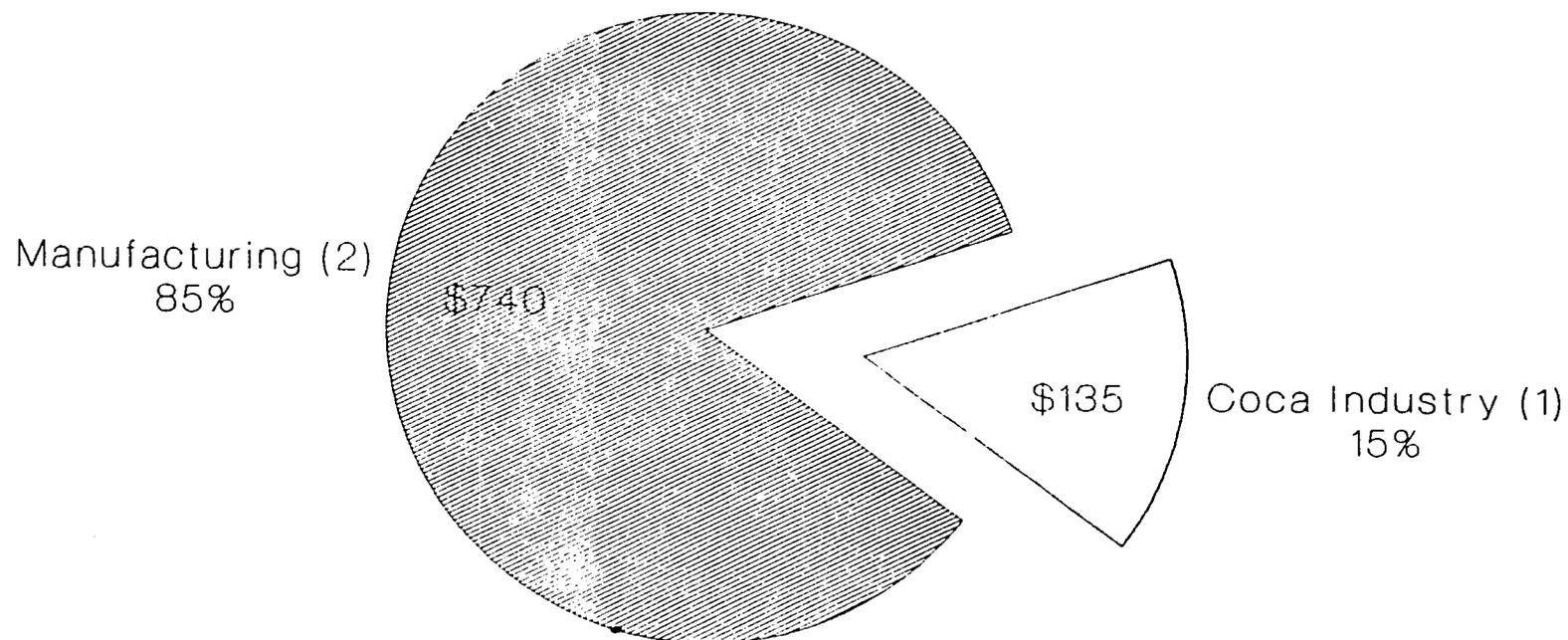
Graph 5

Estimated World Coca Leaf Prod.:1992 (000 MT)



Graph 6

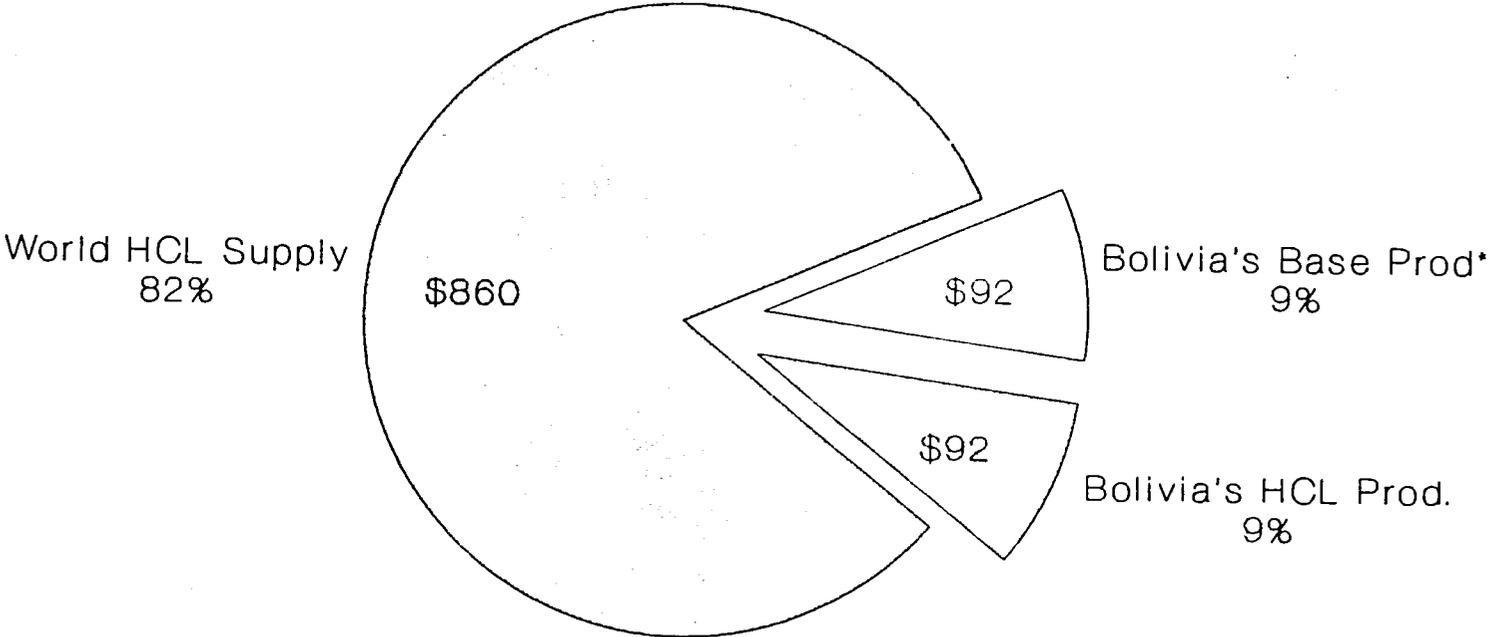
Bolivia's "Manufacturing" Sector: 1992 Cocaine vs. Non-cocaine (Mill. of US\$)



1) (excl. coca leaf production)
2) (manufacturing sector value added)

Graph 7

Estimated Cocaine World Supply: 1992 Bolivia's Share (Mill. of US\$)



* (Cocaine equivalent)

Graph 8

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