

THE REPUBLIC OF COLOMBIA

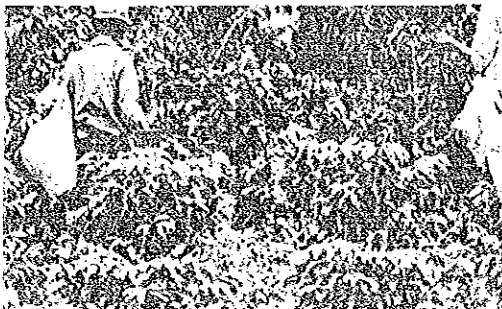
NATIONAL PLANNING DEPARTMENT (D. N. P.)
REGIONAL AUTONOMOUS CORPORATION OF QUINDIO (C. R. Q.)

THE MASTER PLAN STUDY ON THE QUINDIO BASIN INTEGRATED AGRICULTURAL DEVELOPMENT PROJECT

FINAL REPORT

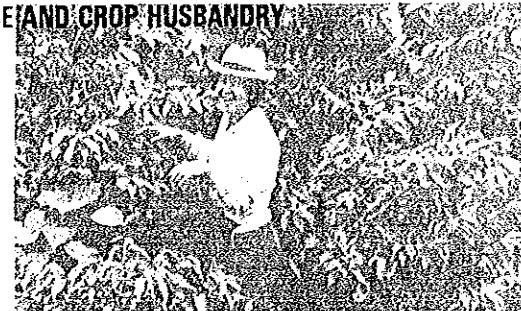
VOLUME II :
ANNEXES (I)

JUNE 1988



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ANNEX H : AGRICULTURE AND CROP HUSBANDRY



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

THE REPUBLIC OF COLOMBIA

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- ANNEX A : NATIONAL AND REGIONAL ECONOMY**
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JUNE 1988

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

国際協力事業団

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**ANNEX A : NATIONAL
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Annex A : NATIONAL AND REGIONAL ECONOMY

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Annex A: NATIONAL AND REGIONAL ECONOMY

A.1 ECONOMIC SITUATION

A.1.1 GENERAL

1986 was an auspicious year with pronounced economic activity. Coffee, on which the country's economy has long been dependent, sold well in the foreign market. Besides the mining sector, crude oil, gold and coal contributed much to a favourable balance of payments. Though a small surplus was achieved in the public finance, the rate of inflation kept soaring with increase of money supply, and the public foreign debt became heavier with its subsequent debt service increase. Underground economy, above all the drugs trade and markets for smuggled foreign goods, make monetary and fiscal management extremely difficult.

A.1.2 GDP

In 1986, an estimate of the GDP at factor cost and at current prices was Col\$6,353.8 billion with the rate of real increase at 5.3% from the previous year. In 1985, production from the primary industry contributed 23.9% of the total GDP. Manufacturing and construction sectors combined contributed 25.4%; commerce, transport and communication, 21.8%. Private consumption consisted of about 73% of the total expenditure in GDP in 1985, with the average real growth rate of 2.1% since 1980. Per capita GDP at current price in 1986 was estimated at Col.\$218,418, which is equivalent to US\$1,124.36 at an average exchange rate of Col\$194.26/US\$. real annual increase rate from 1985 was 3.2%.

A.1.3 EMPLOYMENT

The number of the economically active population exceeded 10 millions in 1985, 72% of them live in the urban area; it has increased 32.8% between 1978 and 1985. 30% of them were employed in the agricultural sector, 13% in the manufacturing sector.

Unemployment rate in the 7 major cities reached its highest record of 14.7% in June 1986, since then it has gone down. It was at 13.3% in March 1987.

In Jan.1987, the government announced plans to create about 50 thousand jobs over the next four years.

25% of the labour force is organized into 5 union organizations.

A.1.4 PRICES

Consumer prices have been rising. The index of 1986 was 325.5 (1980=100) with a 18.9% increase from the previous year. The government tried to minimize the fiscal deficit, succeeded in

avoiding price spiral due to the coffee boom in 1986.

A.1.5 ECONOMIC STRUCTURE

Most economic activities are carried out by private sector, with some exceptions in mining and public utilities sectors. Bogota, Medellin and Cali have stock exchange. In 1986, stocks accounted for 1.2% of the Col\$262.5 billions transacted on the Bogota exchange, due to the inflow of government paper with high rate of return. Foreign investment in Colombia had been regulated in principle by the Andean Pact's Decision 24, but it has much been deregulated recently. The outstanding foreign investment amounted to US\$2,672 million at the end of 1986, of which 67% was from the USA. The central and regional governments have public enterprises in such sectors as mining and manufacturing, public utilities, transport and communications and other tertiary industries. The biggest is Empresa Colombiana de Petroleros, whose annual sales in 1986 were the 48th among third world enterprises. The total amount of fixed of the public enterprises capital in 1982 was Col\$107.94 billion.

A.1.6 PUBLIC FINANCE AND MONETARY CONDITIONS

The fiscal situation has been greatly improved since 1984 when the deficit reached 6.8% of GDP. 1986 saw the surplus of 0.2% of GDP thanks to the high coffee price.

Tax reform bill was approved at the end of 1986. This does not directly raise revenues, but leads to promotion of savings and investments. The government also tries to minimize the deficits of public sector, and to increase the amount of transfer to local governments.

The Bank of the Republic has a function of the central bank. There are 20 private and mixed commercial banks and 4 state owned commercial banks. There are more financial institutions, some of which are owned by the state.

The governments basic monetary policy instrument is open market operation, but recently, with the sign of rapid increase of monetary base, the government took steps to increase reserve requirements.

A.1.7 BALANCE OF PAYMENT

According to the provisional figures, the 1986 current account was DIR in surplus for the first time in 6 years, thanks to the favourable trade balance. Besides coffee export agro-commodities include bananas, cut flowers. Vegetables are beginning to be exported. Colombia became a crude exporter in 1986. Coal was exported in 1986 at a price below the cost of production. Balance of capital account was also favourable in 1986.

A.1.8 FOREIGN EXCHANGE RESERVES AND EXTERNAL DEBT

Foreign exchange reserves at the end of 1986 was US\$2,556 million. A loss of US\$381 million is expected in 1987. Gross external public debt at the end of 1985 reached US\$9,377 million, which raised debt service ratio to 29.2%.

A.1.9 FOREIGN EXCHANGE RATE

The currency has been directly connected to the US dollar by a crawling peg system. The rate was Col\$251.63 to the dollar as of Sep.4; the rate has been declining slowly but steadily.

A.1.10 INPUT-OUTPUT TABLE OF 1982. (AGRO-LIVESTOCK SECTOR)

Analysis of the input-output table of national economy valued at producer price in 1982 was carried out.

18.7% of value produced by the agro-livestock sector was contributed by intermediate sectors, and 81.3% by the value added.

Compensation for employees contributed 42.6% of the total value added, operating surplus contributed 57.4%, leaving the balance of indirect tax and subsidies to be negligible.

Among the intermediate sectors, manufacturing contributed most, with a rate of 8.9%.

To the agro-livestock sector contributed to the sector of processed coffee at the rate of 57.5%; to meat, at 74.4%; and 28% to other agricultural products. The contribution of agro-livestock sector to the total intermediate sector is 8.0%.

52.9% of the products of the agro-livestock sector went to the intermediates sectors, 34.5% to both private and government consumption expenditure. 8.4% went to the gross domestic fixed capital formation, and 4.2% to export.

The import coefficient of the agricultural sector was 12.1%. The demand of Col\$1 billion in the agro-livestock sector induced new demand of Col\$67 million in the manufacturing sector, of Col\$35 million in the finance and other agro-products sector, and Col\$21 million in itself.

On the other hand, a demand of Col\$1 billion in the processed coffee sector induced a demand of Col\$533 million in the agro-livestock sector; the meat sector came at Col\$688 million; and the other agro-products sector came at Col\$292 million.

A.2 ESTIMATION OF URBAN AND RURAL POPULATION UPTO 2005 (WITHOUT PROJECT SITUATION)

A.2.1 RESULT OF ESTIMATION

An estimate of municipality-wise urban and rural population growth of Quindio district upto the year of 2005, the year of the end of the project, was carried out. The calculation is based partly on the growth tendency of urban population for the last 35 years (between 1951 and 1985) and partly on that of rural population for the years between 1983 and 1985 when the phenomena of rural exodus began to slow down. The result is shown in Table A.2.1.

The data and the basis of assumption are given below.

A.2.2 THE DATA AND THE BASIS OF THE CALCULATION OF THE POPULATION INCREASE

- (1) Estimation of total population of Quindio using the four consecutive previous censuses, i.e., 1951, 1964, 1973 and 1985.

Estimated linear regression equation is as follows:

$$Y=4,183X-7,924 \times 10^3 \quad (R^2=0.974) \text{ for the total population.}$$

Y=population, X=year

(estimated logistics curve is not computed because there were no consecutive yearly estimates of population.)

- (2) Observation of regional population growth in comparison with the national population increase.
This observation is done in order to compensate the scarcity of data in estimating the regional population.
 - (i) The yearly national population estimates between 1970 and 1983 are available in the "Bank of Republic Review", which is shown in Table 9.x. A logistics regression equation, which is shown below, is calculated using these series, and its result is given in the same column in the same table.

$$Y=44.195 \times 10^6 / [1 + e^{(58.747 \times 10^{-6} - 44.139 \times 10^{-6})X}]$$

As the estimate in 1985 by the equation is higher than the census figure, an adjustment is done, which is shown in the same table.

- (ii) A comparison between the population of the total nation and that of Quindio is made. It shows the ratio between the two has been decreasing from 1.926% to 1.357% between 1951 and 1985. Our estimate of the both populations sits well with above mentioned trend. Sometime between 2000 and 2005, the growth rate of population of Quindio estimated by linear regression exceeds that of the total nation estimated by logistics regression. This is a sign that a simple estimation method is used to its full extent.

Year	census	estimate #1	growth rate(%) #2			
1970		21,448,847				
1971		21,931,339	2.250	#1 by the Bank of		
1972		22,424,700	2.500	Republic		
1973	22,862,118	22,915,200	2.188	#2 yearly		
1974		23,402,200	2.125	#3 by us		
1975		23,885,700	2.066	#4 to the 1985 census		
1976		24,366,300	2.012	with the same growth		
1977		24,844,300	1.962	rate as our estimate		
1978		25,320,100	1.915	#5 to the municipal-		
1979		25,793,400	1.869	wise urban & rural		
1980		26,263,500	1.823	population estimate		
1981		26,742,200	1.823			
1982		27,229,600	1.823			
1983		27,665,300	1.600			
		estimate #3		adjustment#4	growth rate	
1985	27,837,932	28,568,820	1.620	27,837,932		
1990		30,719,910	1.462	29,933,986	1.462	
1995		32,694,100	1.253	31,857,668	1.253	
2000		34,470,620	1.064	33,588,743	1.064	
2005		36,041,180	0.895	35,119,122	0.895	
	Total Nation	Quindio	NT/Q(%)	adjustment#5	NT/Q(%)	
1951	11,962,360	230,428	1.926			
1964	17,484,509	305,745	1.749			
1973	22,862,118	322,815	1.412			
1985	27,837,932	377,860	1.357			
1990	29,933,986	400,192	1.337	400,112	1.337	
1995	31,857,668	421,107	1.322	422,771	1.327	
2000	33,588,743	442,022	1.361	445,434	1.326	
2005	35,119,122	462,936	1.318	468,093	1.333	

(3) Municipality-wise urban and rural population

- (i) Population growth of the urban area of the each municipality is estimated by linear regression method using the four consecutive censuses. The results on Armenia, Circasia, Montenegro and Quimbaya give correlation coefficient of 0.94-0.99. Calarca's population oscillate; the same with other small townships. Linear trends are drawn from La Tebaida, Buena Vista and Cordoba: the first has only three censuses, the latter two have only two. Disregarding the value of correlation coefficient, all the figures are used preliminary.
- (ii) Between 1983 and 1985, the number of farmers household had increased 2.60% yearly, whereas the rural population had decreased 2.46% yearly. The left four columns of the following table give the rural family situation in 1985.

municipal. population	household h.member	est.member	est.population	in 2005	
Armenia	6,924	2,749	2.52	2.0	5,498
Buena Vista	2,142	668	3.21	2.0	1,336
Calarca	14,798	4,251	3.48	2.0	8,502
Circasia	7,083	2,760	2.57	2.0	5,520
Cordoba	2,755	841	3.28	2.0	1,682
Filandia	6,964	2,503	2.78	2.0	5,006
Genova	4,902	1,925	2.55	2.0	3,850
La Tebaida	2,590	682	3.80	2.0	1,364
Montenegro	7,469	2,044	3.65	3.0	6,132
Pijao	3,630	1,498	2.42	2.0	2,996
Quimbaya	9,146	2,550	3.59	3.0	7,650
Salento	3,579	1,483	2.41	2.0	2,966
Quindio	71,982	23,954	3.00		52,502

Source: IGAC

Above table tells us that the number of rural household is increasing at the same rate as the number of household members keeps decreasing. The trend of rural exodus may reach its limit before long as there is sheer physical existence if the farmlands, except in an extreme case when most of the big farms are managed by non-resident owners using non-resident seasonal labourers.

So we presume the population in 2005 tentatively by using the following method:

household number (1985) x estimated number of household members.

the number of household members in 2005 is estimated as two, except Montenegro and Quimbaya, where the rural situation and the urban-rural relationship are more stable than the other municipalities.

The number is set to three.

The figures of 1990, 1995, 2000 are on the linear line between 1985 census figure and estimated figure.

- (iii) The table of population estimate in the main report is prepared by tabulating the figures estimated in (3.i) and (3.ii). The estimated population of Quindio by this method coincides with the one estimated by 1 with the relative magnitude of difference between 1.10×10^{-2} and 0.00×10^{-4} .

So the figure obtained by method (3.iii) is used as the estimated population of Quindio.

(adjustment #5 is given in the tables on A-2-3 with reference to the ratio between total nation and Quindio.)

A.2.3 INPUT-OUTPUT TABLE

The original matrix is 35x35. The number of items are compressed into 14. Some of the figures of the total amount of rows do not tally with those of the corresponding columns. The smaller figures

are adjusted to the bigger ones, and the differences are given in the row and the column of adjustment. The row is included in the category of value added, and the values of the column are added to those of final consumption.

The model used for this analysis is one of the competitive import types. The inverse matrix is one of the competitive import types. The inverse matrix is

$$[I - (I - M)A]^{-1},$$

in which

A; Matrix of Input Coefficient. (The matrix is given in Tables A.2.2 to A.2.5, in which each $A_{ij} = X_{ij}/X_j$)

I; Unit Matrix.

M; Matrix of Import Coefficients. (The import coefficient table is given adjacent to the input-output table).

Influence Coefficient is calculated from the inverse matrix table. The coefficient of j sector is given as

$$\sum_{n=1}^n b_{ij} / \frac{1}{n} \sum_{j=1}^n \sum_{n=1}^n b_{ij}$$

Production inducement value is calculated as follows:

$$[[I - (I - M)A]^{-1}][I - M][F(e) \text{ or } E]$$

in which

F(c); Final Consumption.

F(I); Final Investment.

E ; Export.

(The total production values of this table do not tally with those in the input-output table because of the rough calculation of inverse matrix.)

Production inducement coefficient is obtained by having each production inducement value divide by the corresponding sub-total of the final demand.

Dependency ratio is calculated by having each production inducement value divide by the total production value of the corresponding sector.

TABLE A.2.1 POPULATION ESTIMATE (WITHOUT PROJECT)

MUNICIPALITY	1990			1995		
	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
ARMENIA	199848	6568	206416	217184	6211	223395
BUENAVISTA	1152	1941	3093	1171	1739	2910
CALARCA	41388	13223	54611	44391	11650	56041
CIRCASIA	11100	6693	17793	12131	6301	18432
CORDOBA	2422	2487	4909	2545	2219	4764
FILANDIA	3255	6474	9729	3245	5985	9230
GENOVA	5634	4639	10273	5801	4376	10177
LA TEBAIDA	16537	2284	18821	18007	1977	19984
MONTENEGRO	22680	7134	29814	24817	6800	31617
PIJAO	4533	3471	8004	4731	3313	8044
QUINBAYA	21827	8772	30599	23824	8398	32222
SALENTO	2624	3426	6050	2682	3273	5955
QUINDIO	333000	67112	400112	360529	62242	422771

MUNICIPALITY	2000			2005		
	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
ARMENIA	234521	5854	240375	251857	5498	257355
BUENAVISTA	1191	1538	2729	1210	1336	2546
CALARCA	47395	10076	57471	50398	8502	58900
CIRCASIA	13162	5911	19073	14194	5520	19714
CORDOBA	2667	1950	4617	2790	1682	4472
FILANDIA	3236	5495	8731	3226	5006	8232
GENOVA	5968	4113	10081	6135	3850	9985
LA TEBAIDA	19477	1671	21148	20948	1364	22312
MONTENEGRO	26954	6466	33420	29091	6132	35223
PIJAO	4929	3155	8084	5128	2996	8124
QUINBAYA	25821	8024	33845	27817	7650	35467
SALENTO	2741	3119	5860	2797	2966	5763
QUINDIO	388062	57372	445434	415591	52502	468093

TABLE A.2.2 INPUT-OUTPUT TABLE (1)

(Unit: million Col\$)

		1-3	4,5	6,7	8	9	10-15
1-3	Agr, Lvst, Ser	6,708	0	0	70,044	123,257	100,653
4-5	ForstFishery	1,112	0	29	0	710	0
6-7	Mine	0	0	1,081	0	0	40
8	ProcessdCafe	0	0	0	4,400	0	0
9	Meat	0	0	0	0	5,122	2,589
10-15	OtrAgrProdct	19,845	0	0	0	60	52,803
20	PetrolProdct	12,740	149	614	30	211	5,329
16-25	ManfcIndustry	49,517	486	3,359	1,195	573	25,022
26	ElecGasWater	105	21	1,712	139	209	4,162
27	Construction	224	0	10,908	13	36	247
28-30	ComTraspComm	5,056	109	3,082	5,856	757	11,680
31,36	Finance	8,331	746	1,810	800	144	9,285
32-35	RentVarServc	66	0	17	6	15	1,051
34	GovService	0	0	0	0	0	0
	IntermTTL	103,704	1,511	22,512	82,523	131,094	212,861
	EmplyeCompns	192,325	3,247	16,648	6,685	3,358	37,807
	OperatSurpls	258,783	20,005	47,965	-2537	26,032	66,303
	IndTax-Subsd	-101	-33	814	35,119	1,092	42,174
	Adjustment	0	0	0	0	0	0
	TtlValuAdded	451,007	23,219	65,427	39,267	34,003	146,284
	TtlDmsProdct	554,711	24,730	87,939	121,790	165,097	359,145

Source: DANE 1982

		20	16-25	26	27	28-30	31
1-3	Agr, Lvst, Ser	0	12,576	0	0	0	0
4-5	ForstFishery	140	7,390	0	195	693	0
6-7	Mine	41,939	23,261	1,155	3,628	180	0
8	ProcessdCafe	0	0	0	0	0	0
9	Meat	0	13,746	0	0	0	0
10-15	OtrAgrProdct	0	2,500	0	0	0	0
20	PetrolProdct	3,307	23,175	8,535	3,185	59,463	459
16-25	ManfcIndustry	4,025	238,796	6,329	86,253	34,101	9,960
26	ElecGasWater	1,912	12,528	2,009	565	5,887	752
27	Construction	224	705	510	0	1,446	471
28-30	ComTraspComm	3,121	23,192	514	3,182	103,122	6,545
31,36	Finance	1,451	30,227	2,581	9,669	40,512	107,953
32-35	RentVarServc	180	523	197	98	5,994	1,413
34	GovService	0	0	0	0	0	0
	IntermTTL	56,299	388,619	21,830	106,805	251,398	127,653
	EmplyeCompns	7,941	134,929	18,433	78,908	151,631	104,314
	OperatSurpls	32,265	79,930	30,528	48,914	290,164	-4153
	IndTax-Subsd	23,008	23,414	-766	4,517	1,748	2,590
	Adjustment	0	5,861	7,467	28,736	46	5,093
	TtlValuAdded	63,214	244,134	55,662	161,075	443,589	107,844
	TtlDmsProdct	119,513	632,753	77,492	267,880	694,987	235,497

TABLE A.2.2 INPUT-OUTPUT TABLE (2)

(Unit: million Col\$)

		32-35	34	Int.TTL	Adjustmnt	FinConsExp
1-3	Agr, Lvst, Ser	11,131	7,745	332,114	15,240	201,215
4-5	ForstFishery	909	215	11,393	0	14,174
6-7	Mine	0	0	71,284	14,464	581
8	ProcessdCafe	772	711	5,923	0	8,710
9	Meat	12,629	3,743	37,829	0	158,910
10-15	OtrAgrProduct	47,747	6,810	129,765	6,328	302,054
20	PetrolProduct	200	4,024	121,421	7,896	36,334
16-25	ManfcIndustry	11,490	26,500	497,506	3,737	355,575
26	ElecGasWater	2,885	3,652	36,538	0	40,954
27	Construction	6,725	4,169	25,678	0	0
28-30	ComTraspComm	965	1,915	169,196	345,951	165,767
31,36	Finance	10,235	5,892	228,666	0	9,923
32-35	RentVarServc	1,386	4,654	15,600	0	517,782
34	GovService	0	0	0	6,676	275,887
	IntermTTL	107,074	69,030	1,682,913	400,292	2,087,866
	EmplyeCompns	116,497	211,865	1,084,570		
	OperatSurpls	297,359	0	1,191,558		
	IndTax-Subsd	11,782	1,668	147,026		
	Adjustment	245	0	50,969		
	TtlValuAdded	425,865	213,533	2,474,123		
	TtlDmsProduct	532,939	282,563	4,157,036		

		FxCptForm	StckIncrs	ExportFOB	FnlDmndTl	TtlDemand
1-3	Agr, Lvst, Ser	9,917	42,316	26,421	295,109	627,223
4-5	ForstFishery	0	0	490	14,664	26,057
6-7	Mine	0	613	13,935	29,593	100,877
8	ProcessdCafe	0		109,330	118,040	123,963
9	Meat	0		4,538	163,448	201,277
10-15	OtrAgrProduct	0	(528)	6,181	314,035	443,800
20	PetrolProduct	0	4,646	17,132	66,008	187,429
16-25	ManfcIndustry	183,665	27,736	47,714	618,427	1,115,933
26	ElecGasWater	0			40,954	77,492
27	Construction	242,202			242,204	267,880
28-30	ComTraspComm	0	0	40,434	552,152	721,348
31,36	Finance	0		4,937	14,860	243,526
32-35	RentVarServc	0	0	0	517,782	533,382
34	GovService	0			282,563	282,563
	IntermTTL	435,784	74,783	271,112	3,269,837	4,952,750

TABLE A.2.2 INPUT-OUTPUT TABLE (3)
(Unit:million Col\$)

		TTLimport	TLDmsProdc	ImpCoefcn	DomProCoefcn
1-3	Agr,Lvst,Ser	72,512	554,711	0.120692	0.897307
4-5	ForstFishery	1,327	24,730	0.051902	0.948097
6-7	Mine	12,938	87,939	0.148811	0.851188
8	ProcessdCafe	2,173	121,790	0.148499	0.851500
9	Meat	36,180	165,097	0.183898	0.816101
10-15	OtrAgrProdc	84,655	359,145	0.193444	0.806555
20	PetrolProdc	67,916	119,513	0.398809	0.601190
16-25	ManfcIndstry	483,180	632,753	0.452322	0.547677
26	ElecGasWater	0	77,492	0.0	1.0
27	Construction	0	267,880	0.0	1.0
28-30	ComTraspComm	26,361	694,987	0.038714	0.961285
31,36	Finance	8,029	235,497	0.033652	0.966347
32-35	RentVarServc	443	532,939	0.000830	0.999169
34	GovService	0	282,563	0.0	1.0
	IntermTTL	795,714	157,036	0.169964	0.830035

TABLE A.2.3 TABLE OF INPUT AND VALUE-ADDED COEFFICIENTS (1)

	1	2	3	4	5	6
1 Agr,Lvst,Ser	0.012092	0.0	0.0	0.575121	0.746573	0.280257
2 ForstFishery	0.002004	0.0	0.000329	0.0	0.004300	0.0
3 Mine	0.0	0.0	0.012292	0.0	0.0	0.000111
4 ProcessdCafe	0.0	0.0	0.0	0.036456	0.0	0.0
5 Meat	0.0	0.0	0.0	0.0	0.031024	0.007208
6 OtrAgrProdct	0.035775	0.0	0.0	0.0	0.000363	0.147024
7 PetrolProdct	0.022966	0.006025	0.006982	0.000246	0.001278	0.014838
8 ManfcIndustry	0.089266	0.019652	0.037059	0.009811	0.003470	0.069671
9 ElecGasWater	0.000189	0.000849	0.019468	0.001141	0.001265	0.011588
10 Construction	0.000403	0.0	0.124040	0.000106	0.000218	0.000687
11 ComTraspComm	0.009114	0.004407	0.035047	0.048082	0.004585	0.032521
12 Finance	0.015018	0.030165	0.020582	0.006568	0.000872	0.025853
13 RentVarServc	0.000118	0.0	0.000193	0.000049	0.000090	0.002926
14 GovService	0.0	0.0	0.0	0.0	0.0	0.0
IntermTTL	0.186951	0.061099	0.255995	0.677584	0.794042	0.592688
EmplyeCompns	0.346712	0.131298	0.189313	0.054889	0.020339	0.105269
OperatSurpls	0.466518	0.808936	0.545434	-0.020830	0.157677	0.184613
IndTax-Subsd	-0.000180	-0.001330	0.009256	0.288357	0.006614	0.117428
Adjustment	0.0	0.0	0.0	0.0	0.021326	0.0
TtlValuAdded	0.813048	0.938900	0.744004	0.322415	0.205957	0.407311
	7	8	9	10	11	12
1 Agr,Lvst,Ser	0.0	0.019875	0.0	0.0	0.0	0.0
2 ForstFishery	0.001171	0.011679	0.0	0.000727	0.000997	0.0
3 Mine	0.036761	0.014904	0.013543	0.000258	0.0	0.0
4 ProcessdCafe	0.0	0.0	0.0	0.0	0.0	0.0
5 Meat	0.021724	0.0	0.0	0.0	0.0	0.0
6 OtrAgrProdct	0.0	0.003950	0.0	0.0	0.0	0.0
7 PetrolProdct	0.027670	0.036625	0.110140	0.011889	0.085559	0.001949
8 ManfcIndustry	0.033678	0.377392	0.081672	0.321983	0.049067	0.042293
9 ElecGasWater	0.015998	0.019799	0.025925	0.002109	0.008470	0.003193
10 Construction	0.001874	0.001114	0.006581	0.0	0.002080	0.002000
11 ComTraspComm	0.026114	0.036652	0.006632	0.011878	0.148379	0.028216
12 Finance	0.012140	0.047770	0.033306	0.036206	0.058291	0.458404
13 RentVarServc	0.001506	0.000826	0.002542	0.000365	0.008623	0.006000
14 GovService	0.0	0.0	0.0	0.0	0.0	0.0
IntermTTL	0.471070	0.614171	0.281706	0.398704	0.361730	0.542057
EmplyeCompns	0.066444	0.213241	0.237869	0.294564	0.218178	0.442952
OperatSurpls	0.269970	0.126321	0.393950	0.182596	0.417509	-0.017630
IndTax-Subsd	0.192514	0.037003	-0.009880	0.016862	0.002512	0.010998
Adjustment	0.0	0.009262	0.096358	0.107271	0.000066	0.021626
TtlValuAdded	0.528929	0.385828	0.718293	0.601295	0.638269	0.457942

TABLE A.2.3 TABLE OF INPUT AND VALUE-ADDED COEFFICIENTS (2)

	13	14	Int.TTL
1 Agr,Lvst,Ser	0.020886	0.027409	0.079892
2 ForstFishery	0.001705	0.000760	0.002740
3 Mine	0.0	0.0	0.017147
4 ProcessdCafe	0.001448	0.002516	0.001424
5 Meat	0.023696	0.013246	0.009099
6 OtrAgrProdct	0.089591	0.024100	0.031215
7 PetrolProdct	0.000375	0.014241	0.029208
8 ManfcIndstry	0.021559	0.093784	0.119678
9 ElecGasWater	0.005413	0.012924	0.008789
10 Construction	0.012618	0.014754	0.006176
11 ComTraspComm	0.001810	0.006777	0.040701
12 Finance	0.019204	0.017312	0.055006
13 RentVarServc	0.002600	0.016470	0.003752
14 GovService	0.0	0.0	0.0
IntermTTL	0.200912	0.244299	0.404834
EmplyeCompns	0.218559	0.749797	0.260899
OperatSurpls	0.557900	0.0	0.286636
IndTax-Subsd	0.022107	0.005903	0.035367
Adjustment	0.000459	0.0	0.012260
TtlValuAdded	0.799087	0.755700	0.595165

TABLE A.2.4 INVERSE MATRIX TABLE (1)

TYPE: $[I - (I-M)A]^{-1}$

	1	2	3	4	5	6
1 Agr,Lvst,Ser	1.021308	0.000510	0.001884	0.533371	0.688061	0.292220
2 ForstFishery	0.002731	1.000191	0.001125	0.001595	0.008064	0.001550
3 Mine	0.007408	0.001921	1.017427	0.005286	0.005499	0.008973
4 ProcessdCafe	0.0	0.0	0.000001	1.032038	0.0	0.000005
5 Meat	0.001441	0.000296	0.001098	0.000945	1.027008	0.008483
6 OtrAgrProdct	0.033733	0.000108	0.000365	0.017707	0.023092	1.144754
7 PetrolProdct	0.017292	0.004623	0.010634	0.012550	0.012938	0.020223
8 ManfcIndstry	0.067330	0.015802	0.059067	0.044980	0.048365	0.079242
9 ElecGasWater	0.002674	0.001557	0.022582	0.003452	0.003294	0.016526
10 Construction	0.001595	0.000405	0.126659	0.001314	0.001396	0.002563
11 ComTraspComm	0.016447	0.007563	0.046377	0.065407	0.016673	0.051451
12 Finance	0.036417	0.054731	0.055562	0.037648	0.027296	0.072831
13 RentVarServc	0.000672	0.000419	0.001101	0.001024	0.000620	0.004414
14 GovService	0.0	0.0	0.0	0.0	0.0	0.0
Total	1.209054	1.088132	1.343888	1.757322	1.860314	1.703202

TABLE A.2.4 INVERSE MATRIX TABLE (2)

TYPE: $[I - (I-M)A]^{-1}$

	7	8	9	10	11	12
1 Agr, Lvst, Ser	0.001529	0.039526	0.002226	0.007134	0.002075	0.002373
2 ForstFishery	0.001818	0.014405	0.000863	0.003304	0.001749	0.000727
3 Mine	0.311251	0.051268	0.037204	0.023462	0.021263	0.004143
4 ProcessdCafe	0.000003	0.000003	0.000004	0.000001	0.000014	0.000014
5 Meat	0.000874	0.023271	0.001274	0.004190	0.001098	0.001270
6 OtrAgrProdct	0.000410	0.006111	0.000588	0.001172	0.001151	0.001224
7 PetrolProdct	1.023723	0.034724	0.072087	0.014700	0.063771	0.007206
8 ManfcIndstry	0.045325	1.274673	0.066194	0.228484	0.047930	0.056931
9 ElecGasWater	0.024616	0.028572	1.030316	0.008078	0.013173	0.007897
10 Construction	0.040957	0.008451	0.011823	1.003497	0.005737	0.004530
11 ComTraspComm	0.046279	0.060316	0.016405	0.027068	1.175318	0.060124
12 Finance	0.045342	0.118656	0.070511	0.086783	0.126621	1.807641
13 RentVarServc	0.002393	0.002452	0.003366	0.001364	0.011095	0.011469
14 GovService	0.0	0.0	0.0	0.0	0.0	0.0
Total	1.544526	1.662423	1.312867	1.409244	1.471000	1.965555

	13	14	Int. TTL
1 Agr, Lvst, Ser	0.054596	0.042006	2.688826
2 ForstFishery	0.002137	0.001760	1.040026
3 Mine	0.002193	0.006769	1.504096
4 ProcessdCafe	0.001277	0.002232	1.035598
5 Meat	0.020913	0.012957	1.105079
6 OtrAgrProdct	0.084142	0.025108	1.339672
7 PetrolProdct	0.003522	0.013270	1.311270
8 ManfcIndstry	0.027493	0.075597	2.137425
9 ElecGasWater	0.007525	0.015885	1.186156
10 Construction	0.013208	0.016180	1.238321
11 ComTraspComm	0.008772	0.014635	1.612841
12 Finance	0.043362	0.043164	2.626573
13 RentVarServc	1.003249	0.017095	1.060741
14 GovService	0.0	1.0	1.0
Total	1.272395	1.286689	20.886630

TABLE A.2.5 (1) INFLUENCE COEFFICIENT AND PRODUCTION INDUCEMENT VALUE

(Unit:million Col\$)

	Influence	Consumpt	FxCapital	Export	Total
1 Agr,Lvst,Ser	0.810411	409,358	53,093	78,549	541,000
2 ForstFishery	0.729358	20,549	2,599	1,187	24,335
3 Mine	0.900788	50,892	13,355	18,190	82,437
4 ProcessdCafe	1.177907	8,956	1	96,078	105,034
5 Meat	1.246941	155,276	3,775	4,646	163,697
6 OtrAgrProdct	1.141631	346,726	2,005	8,444	357,224
7 PetrolProdct	1.035273	84,309	11,231	15,812	111,352
8 ManfcIndustry	1.114305	354,564	206,137	42,945	603,646
9 ElecGasWater	0.879995	68,793	5,461	2,297	76,551
10 Construction	0.944595	20,264	244,280	2,467	267,115
11 ComTraspComm	0.985990	620,441	14,426	55,366	690,233
12 Finance	1.317482	172,007	36,554	22,613	231,174
13 RentVarServc	0.852868	531,450	651	723	532,824
14 GovService	0.862449	282,563	0	0	282,563
Total		3,126,151	593,618	349,618	4,069,185

TABLE A.2.5 (2) PRODUCTION INDUCEMENT COEFFICIENT

	Consumption	FxCapital	Export	Total
1 Agr,Lvst,Ser	0.164552	0.103987	0.289730	0.165451
2 ForstFishery	0.008258	0.005089	0.004377	0.007442
3 Mine	0.020453	0.026157	0.067094	0.025211
4 ProcessdCafe	0.003599	0.000001	0.354384	0.032122
5 Meat	0.062406	0.007393	0.017137	0.050062
6 OtrAgrProdct	0.139350	0.004024	0.031144	0.109248
7 PetrolProdct	0.033884	0.021997	0.058321	0.034054
8 ManfcIndustry	0.142500	0.403740	0.158402	0.184610
9 ElecGasWater	0.027648	0.010696	0.008471	0.023411
10 Construction	0.008145	0.478448	0.009469	0.081690
11 ComTraspComm	0.249357	0.028255	0.204217	0.211090
12 Finance	0.069103	0.071595	0.083408	0.070698
13 RentVarServc	0.213598	0.001274	0.002667	0.162951
14 GovService	0.113563	0.0	0.0	0.086415
Total	1.256411	1.162664	1.288826	1.244461

TABLE A.2.5 (3) DEPENDENCY RATIO

	Consumption	FxCapital	Export	Total
1 Agr,lvst,Ser	0.756668	0.098138	0.145193	1.0
2 ForstFishery	0.844433	0.106793	0.048772	1.0
3 Mine	0.617342	0.162004	0.220652	1.0
4 ProcessdCafe	0.085262	0.000007	0.914729	1.0
5 Meat	0.948557	0.023059	0.028382	1.0
6 OtrAgrProdct	0.970611	0.005752	0.023636	1.0
7 PetrolProdct	0.757139	0.100864	0.141996	1.0
8 ManfcIndustry	0.587371	0.341486	0.071142	1.0
9 ElecGasWater	0.898658	0.071339	0.030001	1.0
10 Construction	0.075874	0.914514	0.009610	1.0
11 ComTraspComm	0.898886	0.020900	0.080213	1.0
12 Finance	0.744057	0.158124	0.097817	1.0
13 RentVarServc	0.997421	0.001221	0.001357	1.0
14 GovService	1.0	0.0	0.0	1.0
Total	0.768249	0.145881	0.085868	1.0

A.3 TABLES OF GDP AND BALANCE OF PAYMENTS

Tables of GDP and balance of payments are shown in Tables A.3.1 and A.3.2.

TABLE A.3.1 GDP (1)

(Unit: Million Col\$)

Year	1975	1976	1977	1978
GDP constant 1975	405,108	424,263	441,906	479,335
Real GDP Growth	2.3%	4.7%	4.2%	8.5%
ConsuPreInflation	25.7%	31.4%	34.5%	27.0%
GDP current price	405,108	532,270	716,029	909,487
Private Consumption	293,239	378,192	498,435	637,893
Gov. Consumption	36,176	43,682	55,216	77,820
Gross Fixed Capital	6,709	8,910	30,229	26,396
Change in Stocks	62,129	84,571	104,041	139,897
Export (fob)	68,730	97,211	130,201	162,404
(-): Import (cif)	61,875	80,296	102,093	134,923
Agro-silvio-fishery	96,766	125,768	179,344	209,550
Mining	6,937	19,408	10,788	12,267
Manufacturing	94,086	128,678	170,706	211,355
Construction	13,535	19,343	27,605	37,457
Commerce, hotel	53,767	68,250	91,607	122,670
Transpt. & Communctus	34,117	44,829	59,729	74,107
Elec., gas and water	3,807	5,688	7,871	11,442
Bank, fin. & insrence.	27,532	35,231	44,528	57,650
House Rent	29,038	36,500	46,379	64,058
Personal Services	20,134	25,438	34,871	47,941
Government Service	28,300	35,284	45,386	63,382
(-): ComputBankService	11,240	14,143	17,557	22,458
Import duties	8,329	11,006	14,772	20,066
Population (1000)	23,886	24,366	24,844	25,320
Per head GDP (US\$)	508	536	631	740
ExchangeRate(CO1/US)*	--	--	--	--

Source: Banco de la Republica, *: IMF (end of year)

TABLE A.3.1 GDP (2)

(Unit: Million Col\$)

Year	1979	1980	1981	1982
GDP constant 1975	505,119	525,765	537,736	542,836
Real GDP Growth	5.4%	4.1%	2.3%	0.9%
ConsMPrCInflation	30.7%	32.8%	27.5%	24.5%
GDP current price	1,188,812	1,579,130	1,982,773	2,497,298
Private Consumption	835,909	1,104,816	1,430,105	1,810,438
Gov. Consumption	110,722	159,371	206,874	272,766
Gross Fixed Capital	32,457	36,233	58,879	75,534
Change in Stocks	183,325	264,894	350,048	436,091
Export (fob)	197,510	274,637	257,482	299,444
(-): Import (cif)	171,106	260,811	320,615	396,975
Agro-silvio-fishery	255,190	305,718	381,639	468,621
Mining	17,585	36,172	48,820	64,538
Manufacturing	267,099	367,460	422,615	529,922
Construction	50,147	74,526	102,130	128,767
Commerce, hotel	161,017	209,553	269,371	340,848
Transpt.& Communctns	103,952	140,533	169,787	207,926
Elec.,gas and water.	16,150	20,716	33,235	48,006
Bank,fin.& insrnce.	78,520	106,326	142,784	181,439
House Rent	89,105	110,240	143,258	182,574
Personal Services	64,518	82,942	110,180	141,090
Government Service	85,691	121,461	162,127	212,620
(-):ComputBankServic	28,971	40,189	58,607	78,757
Import duties	28,814	43,717	55,434	69,704
Popultion (1000)	25,793	26,263	26,742	27,230
Per head GDP (US\$)	823	1,003	1,035	1,001
ExchangeRate(C01/US)*	44	50.92	59.07	70.29

Source: Banco de la Republica, *: IMF (end of year)

TABLE A.3.1 GDP (3)

(Unit: Million Col\$)

Year	1983	1984	1985p	1986e
GDP constant 1975	551,380	569,856	583,715	614,600
Real GDP Growth	1.6%	3.4%	2.4%	5.3%
ConsMPrInflation	19.8%	16.1%	24.0%	18.9%
GDP current price	3,054,137	3,856,584	4,865,132	6,353,800
Private Consumption	2,208,216	2,734,007	3,424,031	
Gov. Consumption	334,565	425,631	521,342	
Gross Fixed Capital	82,719	76,941	54,625	
Change in Stocks	524,847	654,459	805,863	
Export (fob)	339,988	485,649	731,500	
(-): Import (cif)	436,198	520,103	672,229	
Agro-silvio-fishery	571,548	671,390	837,701	
Mining	88,646	127,337	205,018	
Manufacturing	640,794	852,716	1,055,461	
Construction	169,700	219,951	281,705	
Commerce, hotel	413,726	534,613	668,339	
Transpt. & Communctns	254,255	317,870	410,219	
Elec., gas and water	62,932	82,784	108,584	
Bank, fin. & insrnce.	221,125	243,913	311,305	
House Rent	218,023	259,999	310,133	
Personal Services	177,804	216,151	255,747	
Government Service	266,749	349,012	417,426	
(-): ComputBankServic	105,404	103,850	127,390	
Import duties	74,239	84,698	130,884	
Popultion (1000)	27,665	28,080	28,501	29,090
Per head GDP (US\$)	999	1,033	1,116	1,200
ExchangeRate(CO1/US)*	88.77	113.89	172.20	219

p:provisional e:estimate

Source: Banco de la Republica, *:IMF(end of year)

TABLE A.3.2 BALANCE OF PAYMENT (1)
(Unit: Million US dollar)

Items	1977	1978	1979	1980	1981
coffee	1,577	1,936	2,086	2,208	1,507
others	1,097	1,283	1,429	2,008	1,890
Total Exports	2,674	3,219	3,515	4,296	3,397
Total Imports	1,969	2,552	2,978	4,283	4,730
Trade Balance	705	667	537	13	(1,333)
financial	(272)	(301)	(255)	(211)	(427)
others	(89)	(109)	128	137	(204)
Service Balance	(361)	(410)	(127)	(74)	(631)
Transfer	46	73	102	165	169
CURRENT ACCOUNT	390	330	512	102	(1,722)
long trm credit	199	109	577	750	981
shrt trm credit	9	23	(22)	(88)	165
Public Sector	208	132	555	667	1,146
direct investment	43	66	103	51	228
long trm credit	(6)	(32)	104	57	403
shrt trm credit	(264)	119	238	305	256
Private Sector	(227)	153	445	413	887
Others	(5)	(143)	(23)	(135)	6
CAPITAL ACCOUNT	(24)	142	977	945	2,039
CURRENT ITEMS	0	0	24	24	24
ERRORS, OMISSION	301	188	98	162	(100)
CHANGE in RESERVE	667	660	1,611	1,235	241

negative values in parentheses.
Source : Banco de la Republica

TABLE A.3.2 BALANCE OF PAYMENT (2)
(Unit: Million US dollar)

Items	1982	1983	1984	1985	1986p
coffee	1,515	1,443	1,734	1,712	2,736
others	1,767	1,704	1,889	2,171	2,714
Total Exports	3,282	3,147	3,623	3,883	5,447
Total Imports	5,358	4,464	4,027	3,734	3,486
Trade Balance	(2,076)	(1,317)	(404)	149	1,991
financial	(787)	(918)	(1,240)	(1,354)	(1,505)
others	(191)	(755)	(705)	(479)	(765)
Service Balance	(978)	(1,673)	(1,945)	(1,833)	(2,270)
Transfer	169	164	299	464	774
CURRENT ACCOUNT	(2,885)	(2,826)	(2,050)	(1,220)	495
long trm credit	960	943	1,217	1,149	1,673
shrt trm credit	306	202	(198)	243	(765)
Public Sector	1,266	1,145	1,019	1,392	872
direct investment	337	514	561	729	673
long trm credit	330	73	47	181	53
shrt trm credit	332	(288)	(424)	(451)	(502)
Private Sector	999	299	184	459	224
Others	(34)	(8)	(259)	(1)	39
CAPITAL ACCOUNT	2,231	1,436	944	1,850	1,135
CURRENT ITEMS	0	(67)	20	(39)	50
ERRORS, OMISSION	(47)	(266)	(175)	(307)	(214)
CHANGE in RESERVE	(701)	(1,723)	(1,261)	284	1,466

negative values in parentheses. P; Provisional

Source : Banco de la Republica

**ANNEX B : AGRO-ECONOMY
AND
AGRICULTURAL INSTITUTION**

Annex B: AGRO-ECONOMY AND AGRICULTURAL INSTITUTION

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B.1 NATIONAL AGRICULTURAL ASPECTS

B.1.1 Gross Domestic Products and Agricultural Sector

In 1985, according to the preliminary estimate of the Banco de la Republica, the agricultural sector including silviculture and fishery produced Col.\$126,583 million of products at the constant price of 1975. The share of the sector to the GDP was 21.68%, which was the second highest rate next to the manufactural sector. In terms of the current price, the output was Col.\$837,701 million with a growth rate of 24.8% from the previous year.

For the last decade (1976 - 1985), the rate of growth of agricultural output had been stagnant; the output rose at as low as 2.40% per annum for the period, which was inferior to the yearly growth rate of the GDP (3.24%). Consequently, the importance of the agricultural sector was decelerating within the context of the national economy; the participation of the agricultural sector in the GDP fell down from 38.2% in 1950 and 29% in 1970 to 21.7% in 1985.

B.1.2 Land Use and Land Tenure

The 1985 survey conducted ICA and IGAC provide the latest comprehensive information on land potentiality and land use in the national level. It is estimated that about 14.4 million ha of land in Colombia, or 12.6% of the national territory (114.1 million) is arable for agricultural use, of which 3.8 million has access to irrigation services. On the other hand, grazing or rough grazing lands cover 19.3 million (16.9% of the total land). In terms of arable area per capita, Colombia comes close to world average, with about 0.52 hectare. The same information indicates that the harvested areas for agricultural production and livestock for 1985 was 3.953 million ha and 22.6 million ha respectively. This information intimates that there are considerable margin of arable lands for the expansion of agricultural production and some portion of them is actually used for pastures due to lack of infrastructure and other reasons.

Land ownership by size in Colombia is, like other countries in Latin American, characterized by an imbalanced distribution; small and medium owners (minifundistas) with holdings below 10 ha represent 78.1 percent of the total number of properties but only 8.8 percent of the total rural land, while 60.8 percent of rural lands is held by only 3 percent of land owners with holdings more than 100 ha (latifundistas).

B.1.3 Agricultural Production

Coffee, the mainstay of the Colombian economy, produced 50,218.6 million of Colombian pesos in 1986, which accounted for 17.3% of the total value added to crop production. The production volume for the same year was 720 thousand tons and the participation of Colombian coffee in the world market rose to 15.5% from 12.7% of the previous year due to the shortage of Brazilian products which were damaged by drought.

The production of coffee has been stagnated for the last three years (1985 - 1987) after having registered a maximum production in 1984. This recession in production is attributable to the acceleration for the renovation and stumping of aged plants. The harvested area of coffee, which showed an increase up to 1982 and then has decreased in last three years. With an exception of 1985 in which production was badly affected by meteorological conditions, the unit yield of coffee in the national level is maintained in the range of 0.75 - 0.85 ton/ha for the last six years.

Apart from coffee, following crops registered a higher contribution of value added to the total crop production in 1985: brown sugarcane (9.33%), rice (8.55%), sugarcane (7.95%), potato (7.08%), plantain (6.01%), corn (4.97%) and cassava (4.54%).

Fig. 2.3.1 indicates the evolution of the harvested area, production, and unit yield with respect to the main 11 crops of the country for the period 1970 - 1986. The crops which showed a higher growth in production are: sorghum (550%), brown sugarcane (270%), rice (260%), cacao (240%) and potato (220%). The growth of these crops is attributable to the expansion in harvested area for sorghum, cacao and potato and to the intensification of production per unit land for brown sugarcane (201%) and rice (184%). On the other hand, a stagnation or recession in production has been reported for cassava, corn, soybean, wheat, barley, and plantain. Of these crops, as for wheat and plantain, the decline in the harvested area has adversely affected the unit yield. The inactivity of production for the rest of the crops is due to combined stagnation both in harvested area and unit yield.

B.1.4 Trade in Agricultural Products

Colombia continues to be a net exporter of agricultural and livestock products and in 1986 the trade surplus exceeded US\$3.4 million. This surplus owed in its great majority to coffee and if coffee is excluded from consideration, it is reduced to as little as US\$243 thousand.

Up to 1960, the participation of coffee in the total national exports had been more than 90% in value terms and coffee contributed greatly to finance the governments budget. In recent years (1982 - 1985), because of the expansion of exports other than agro-products, the contribution of coffee to total national exports was reduced to around 50%. Nevertheless in 1986, coffee's share was recovered to the level of 58.5% of total exports owing to the coffee bonanza caused by the rise in price in international market which was rooted in the decline of Brazilian products.

Although its position has become less important in comparison with in the 60's and 70's, coffee still remains the largest contributor of the foreign exchange earning of the country. As Table 2.3.4 indicates, the participation of agro-products in the total exports has been strongly affected by coffee; the agro-products' exportation escalated to more than 70% of the total exports for 1970 together with 1976 - 1980 when the coffee's participation

accounted for approximately 60% of the total; while the coffee's exportation was reduced to 50% or less, the agro-products trade had leveled off in the range of 65 - 69%. Apart from coffee, there has been a large expansion in exportation of banana and cut flowers, while a decline in the share has taken in such exports as cotton, sugar and beef in the 80's.

The importation of foods and agriculture-related materials and inputs represented one fourth of the total volume of imported commodities in 1986. With respect to the participation in value terms of total imports, the agro-products accounted for 8.4%, which was declined from 9.9% of average rate for the previous three years 1983 - 1985. A sharp drop of food and agriculture related materials and inputs both in value and volume in 1986 is caused by the government's policy for protecting national products; 10% of tariff was imposed to IDEMA on CIF value of imported primary materials. As for the individual product, the share of wheat recorded the highest level with the participation of more than one thirds (35.3%); subsequently, soybean oil (11.3%), animal fodder (5.7%), fish flour and powder (5.3%) and barley (4.9%) were largely imported in 1986. Finally, it is worth while to note that the imported volume of foods had been increased at an average rate of 8.5% p.a. between 1970 to 1985 that is considered to be a very high pace of expansion if one takes the yearly population growth rate of 2.5% (1973 - 1985) into account.

B.1.5 Labor Force

In 1984, the agricultural sector provided the greatest opportunity of employment within the country's labor market with participated 32.7% of the total employment. As the contribution to the GDP, the importance of the agricultural sector was reduced relatively in recent years; the participation of the sector, which registered 56% of the nation's total employment in 1951, reduced to 49% in 1964 to 35% in 1980, and to 33% in 1984, as cited above (see Table B.1.9).

The projection of the National Apprenticeship Service (SENA) estimates the requirement of manpower for the agricultural sector at 2,451 thousand in 1987, of which 1,713 thousand (70%) are crop husbandry, 547 thousand (22%) for livestock, and 191 thousand (8%) for indirect workers.

The demand of manpower for coffee production has increased in these days, because more workers are required for stumping and renovation of plants and for the harvesting of highly yielding plants. With regard to labor requirements for crops other than coffee, a drastic increase has taken place for African palm and potato, while a notable decrease has occurred for cotton and cassava.

TABLE B.1.1 GROSS DOMESTIC PRODUCTS AND AGRICULTURAL PRODUCTION
AT CONSTANT PRICE OF 1975

Unit: In millions of Col.\$

Year	Gross Domestic Product		Agricultural Production ^{2/}		(B)/(A) x 100
	Amount (A)	Annual Growth Rate (%)	Amount (B)	Annual Growth Rate (%)	
1976	424,263		99,720		23.50
1977	441,906	4.16	109,979	10.29	24.89
1978	479,335	8.47	111,336	1.23	23.23
1979	505,119	5.38	116,730	4.84	23.11
1980	525,765	4.09	119,314	2.21	22.69
1981	537,736	2.28	123,135	3.20	22.90
1982	542,836	0.95	120,803	1.89	22.25
1983	551,380	1.57	124,196	2.81	22.52
1984	568,979	3.19	126,375	2.40	22.21
1985 1/	583,715	2.59	126,553	0.14	21.68
Average 1987 - 1985		3.24		2.40	
Growth Rate 1981 - 1985		1.65		1.10	

Source: Revista del Banco de la República, Abril, 1987

Note: 1/ Preliminary Estimate
2/ Includes silviculture and Fishery

TABLE B.1.2 ACTUAL AND POTENTIAL LAND USE IN COLOMBIA

Item	Potential Area (ha)	%	Actual Use (ha)
I. Arable Lands	14,362,867	12.6	3,953 x 10 ³
1) Irrigated lands	3,835,169	3.4	
2) Uplands	10,527,698	9.2	
1. Plain lands	2,692,450	2.4	
2. Slope lands	7,835,248	6.9	
II. Pastures	19,251,400	16.9	22,600 x 10 ³
1) Intensive livestock	8,342,625	7.3	
2) Extensive livestock	10,908,775	9.6	
III. Forests	78,295,485	68.6	53,516 x 10 ³
1) Potential lands for agricultural and livestock use	11,202,275	9.8	
2) Other lands	67,093,210	58.8	
IV. Alienated lands (Lakes, swamps, rivers, roads and urban area)	2,259,049	2.0	
Total	114,174,800	100.0	

Source: I.C.A. - IGAC "Zonificación Agroecológica de Colombia",
Memoria Explicativa, 1985

TABLE B.1.3 DISTRIBUTION OF LAND IN RURAL AREA BY SIZE, 1985

Land Size (ha)	No. of Property	%	Total Area	%
Less than 1	651,077	32.9	240,524	0.6
1 - 5	677,652	34.3	1,588,636	4.2
5 - 10	214,685	10.9	1,487,591	4.0
10 - 50	306,435	15.5	6,853,524	18.3
50 - 100	66,836	3.4	4,527,012	12.1
100 - 500	52,290	2.6	9,911,929	26.5
More than 500	7,111	0.4	12,857,800	34.3
Total	1,976,086	100	37,467,016	100

Source: Instituto Geografico, "Agustin Codazzi",
Subdirección Nacional de Catastro

TABLE B.1.4 PRODUCTION OF COFFEE IN COLOMBIA AND
ITS SHARE IN THE WORLD MARKET

Unit: In thousand of ton

Year	National Production in Colombia	World Production	Participation of Colombian Coffee
1978	618	4,176	14.9
1979	648	4,470	14.5
1980	762	4,914	15.5
1981	780	4,728	16.5
1982	774	5,856	13.2
1983	792	4,860	16.3
1984	810	5,298	15.3
1985	642	5,082	12.6
1986	714	5,622	12.7
1987 1/	720	4,633	15.5

Note: 1/ Estimated figure

Source: U.S. Department of Agriculture and FEDECAFE

TABLE B.1.5 PRODUCTIVITY OF COFFEE IN COLOMBIA

Year	Harvested Area (10 ³ ha)	Production (10 ³ ton)	Unit Yield (ton/ha)
1971 - 75	932	456	0.49
1976 - 80	938	611	0.65
1981	977	780	0.80
1982	986	774	0.78
1983	986	792	0.80
1984	979	810	0.83
1985	967	642	0.66
1986	956	714	0.75

Source: Information of FEDECAFE

TABLE B.1.6 OUTPUT OF PRINCIPAL CROPS (1982 - 1986)

Unit: In millions of Col.\$

	1982	(%)	1983	(%)	1984	(%)	1985	(%)	1986	(%)
Coffee	53,093.7	(20.39)	60,150.0	(22.63)	50,620.0	(19.52)	49,467.0	(18.24)	50,218.6	(17.34)
Brown Sugarcane	16,365.8	(6.28)	17,325.7	(6.51)	17,639.0	(6.80)	25,803.0	(9.51)	27,040.7	(9.33)
Rice	28,456.6	(10.93)	25,095.2	(9.44)	23,910.8	(9.22)	25,354.6	(9.35)	24,782.2	(8.55)
Sugarcane	22,089.6	(8.48)	22,148.3	(8.33)	19,561.4	(7.54)	22,690.5	(8.37)	23,027.5	(7.95)
Potato	20,722.8	(7.96)	21,086.3	(7.93)	23,750.6	(9.16)	18,422.0	(6.79)	20,489.4	(7.07)
Plantain	15,726.2	(6.04)	17,742.2	(6.67)	16,605.3	(6.40)	16,696.7	(6.15)	17,420.1	(6.01)
Corn	14,170.7	(5.44)	13,624.9	(5.12)	13,634.3	(5.25)	12,030.0	(4.43)	14,405.7	(4.97)
Cassava	13,506.6	(5.18)	13,528.3	(5.09)	12,062.2	(4.65)	11,897.7	(4.38)	13,168.1	(4.54)
Cotton	5,166.5	(1.98)	4,386.1	(1.65)	8,183.6	(3.15)	11,422.8	(4.21)	11,469.9	(3.96)
Banana	9,539.7	(3.66)	8,015.5	(3.01)	9,183.6	(3.54)	8,308.4	(3.06)	9,318.4	(3.21)
Sorghum	7,344.7	(2.82)	7,697.7	(2.89)	7,625.3	(2.94)	6,458.7	(2.38)	8,463.4	(2.92)
African Palm	3,497.3	(1.34)	4,182.8	(1.57)	4,868.3	(1.87)	5,143.3	(1.89)	5,336.2	(1.84)
Kidney Bean	3,382.4	(1.29)	3,885.9	(1.46)	3,809.9	(1.46)	4,726.7	(1.74)	5,306.3	(1.83)
Total Crop Production	260,332.7		265,765.4		259,249.0		271,068.7		289,517.0	

TABLE B.1.7 EXPORTATION OF PRINCIPAL AGRO-PRODUCTS (1970 - 1984)

Unit: In thousand of US\$

	1970		1971 - 74		1975 - 79		1980		1981		1982		1983		1984		1985		1986	
	Amount	%	Average Amount	%	Average Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Coffee	511,139	49.3	671,783	45.8	1,612,185	61.5	2,360,509	59.8	1,423,284	48.1	1,561,494	50.5	1,506,187	48.9	1,764,503	50.7	1,745,521	49.1	2,990,530	58.5
Banana	17,292	1.7	31,612	2.2	61,661	2.4	94,141	2.4	122,430	4.1	151,119	4.9	147,696	4.8	197,915	5.7	156,115	4.4	199,842	3.9
Sugar	35,726	3.4	91,005	6.2	22,155	0.8	164,673	4.2	76,881	2.6	54,720	1.7	68,992	2.2	28,617	0.8	36,857	1.0	36,218	0.7
Cotton	40,594	3.9	74,668	5.1	66,588	2.5	82,291	2.1	93,419	3.2	26,515	0.9	23,062	0.7	48,095	1.4	59,472	1.7	44,672	0.9
Flowers	7,299	0.7	19,311	1.3	42,491	1.6	97,016	2.5	108,573	3.7	111,482	3.6	120,557	3.9	129,492	3.7	132,054	3.7	148,532	2.9
Beef	27,106	2.6	22,869	1.6	26,844	1.0	15,590	0.4	12,876	0.4	38,362	1.2	30,514	1.0	10,065	0.3	5,572	0.2	16,738	0.3
Total Agro-Products	684,234	65.9	1,005,842	68.6	1,926,915	73.5	2,946,295	74.7	1,938,783	65.6	2,109,546	68.2	2,051,778	66.6	2,363,299	67.8	2,320,077	65.3	3,653,708	71.5
Total Export	1,037,548	100	1,465,187	100	2,622,870	100	3,945,048	100	2,956,967	100	3,094,967	100	3,080,893	100	3,483,893	100	3,551,886	100	5,107,936	100

Source: BOLETIN ESTADISTICAS AGROPECUARIAS, Anuario 1985 y 1987
Ministerio de Agricultura

TABLE B.1.8 IMPORTANCE OF AGRO-PRODUCTS (1970 - 1986)

Unit: In thousand of US\$

	1971-74		1975		1976-79		1980		1981		1982		1983		1984		1985		1986			
	Amount	X	Average Amount	X	Amount	X	Amount	X	Amount	X	Amount	X	Amount	X	Amount	X	Amount	X	Amount	X		
<u>Direct Consumption</u>																						
Apples, Grapes, Pears, etc.	2,661	6.2	7,318	7.5	9,675	8.4	14,484	9.1	42,605	10.5	38,900	10.1	35,774	9.1	54,063	13.2	17,988	5.2	22,164	7.2	26,351	13.0
<u>Starchy Material</u>																						
Wheat	12,745	29.8	42,892	44.2	54,109	46.7	48,774	23.6	128,797	31.8	71,405	18.5	104,321	26.6	127,441	31.0	119,166	34.7	98,552	24.7	98,869	32.3
Barley	30922	9.2	4,059	4.2	2,422	2.1	12,136	5.9	8,796	2.2	19,469	5.0	27,177	6.9	21,111	5.1	19,279	5.6	17,268	5.6	15,868	4.9
Sorghum	-	-	29	0	-	-	4,762	2.3	26,153	6.5	1,635	0.4	8,440	2.2	26,666	6.5	6,644	1.9	11,807	3.8	6,105	2.5
Corn	427	1.0	4,937	5.1	1	0	8,048	3.9	30,839	7.6	15,234	3.9	17,175	4.3	11,132	2.7	1,394	0.4	4,692	1.5	4,906	2.0
Cacao	8,345	19.6	7,721	8.0	5,893	5.1	151	0	-	-	282	0	4,698	1.2	299	0.1	1,685	0.5	6,930	2.3	1,671	0.7
Others	1,341	3.1	3,694	3.8	5,048	4.4	7,119	3.4	8,626	2.1	7,895	2.1	9,348	2.4	49,345	12.1	44,995	13.2	58,555	19.0	30,597	12.7
Sub Total	26,786	62.9	63,332	65.3	67,474	58.2	80,990	39.1	203,211	50.1	116,020	30.1	171,159	43.6	296,194	57.5	193,153	56.2	197,824	64.1	139,450	58.1
<u>Industrial Inputs</u>																						
Unrefined soybean oil	32	0	389	0.4	4,333	3.7	25,512	12.3	52,422	12.9	102,352	26.5	75,821	19.3	47,809	11.6	49,511	14.4	34,649	11.2	27,156	13.2
Flour and powder of fish	878	2.1	549	0.6	996	0.9	6,437	3.1	18,763	4.6	23,889	6.2	21,611	6.5	17,881	4.3	31,765	9.2	13,791	4.3	12,765	5.3
Grease and oil of fish	5,959	14.0	7,345	7.6	7,310	6.3	16,918	8.2	14,222	3.5	25,038	6.6	25,640	6.5	12,318	3.0	19,592	5.7	9,714	3.1	9,868	3.8
Animals' fodder	5,267	12.4	7,573	7.8	9,249	8.0	14,656	7.1	20,356	5.0	19,780	3.3	12,860	3.3	15,750	3.8	16,605	4.8	19,129	6.2	15,618	5.7
Others	645	1.5	9,277	9.6	16,890	14.4	30,202	18.5	42,471	10.5	65,972	17.2	28,933	7.4	23,886	5.8	14,702	4.3	10,921	28.4	10,792	4.5
Sub Total	12,781	30.0	25,133	25.9	39,578	33.3	101,715	49.1	148,234	36.6	230,031	59.5	168,865	43.0	117,644	28.7	132,175	38.4	87,704	28.4	73,401	30.4
<u>Processed for Direct Consumption</u>																						
Refined soybean, oil, butter, cheese, etc.	360	0.8	1,209	1.2	123	0.1	5,410	2.6	11,183	2.8	744	0.2	2,803	0.7	2,594	0.6	481	0.1	731	0.2	954	0.4
Total	42,582	100	96,992	100	115,850	100	206,999	100	405,303	100	385,695	100	378,601	100	419,495	100	343,797	100	308,423	100	240,156	100

Source: BOLETIN ESTADISTICAS AGROPECUARIAS, Anuario 1985 y 1987
Ministerio de Agricultura

TABLE B.1.9 COMPOSITION OF EMPLOYMENT BY ECONOMIC SECTOR
(1938 - 1984)

Sector	1938	1951	1964	1974	1980	1984
Agriculture	59.2	55.9	49.0	41.9	34.8	32.7
Mining	2.3	1.7	1.6	0.8	0.9	1.1
Manufacture	14.1	12.7	13.2	14.3	17.5	16.4
Construction	2.8	3.7	4.5	4.7	4.6	5.0
Electricity, Gas and Water	0.2	0.3	0.3	0.5	0.3	0.3
Commerce	5.7	5.6	8.9	12.6	16.5	17.8
Transport and Communication	2.0	3.6	3.9	4.1	4.4	4.5
Other Service	13.5	16.5	19.7	21.1	20.9	22.1
- Domestic	8.6		9.9	5.9	3.3	3.4
- Non-domestic	5.0		8.8	15.2	17.6	18.6

Source: Informe de Empleo, Misión Chenery, Julio 1986

B.2 NATIONAL AND REGIONAL AGRICULTURAL PLANS

B.2.1 National Socio-economic Development Plans and Programs 1987-1990

Under the administration of the President Virgilio Barco, Socio-economic Development Plans and Programs 1987-1990 has been elaborated.

The development of the agricultural sector within the context of the Development Plans and Programs 1987-1990 envisages to recover the dynamics of agricultural production, to endow farmers with resources that will permit them to enhance their living standard, and to increase their earnings.

For the purpose of attaining the above cited objectives for the period 1987-1990, the following policies have been proposed.

(1) Utilization of Renovatable Natural Resources

In order to secure a continuous development of the agricultural sector, it is required to conserve and protect productive potentiality of natural resources. For this purpose, emphasis shall be laid on the implementation of the following programs:

- To encourage the effective use of lands to cope with their capability for production.
- To control water pollution in rivers which are sources for supplying domestic water for urban areas and irrigation water for agricultural exploitation areas.
- To clamp and extend the application of law on the conservation of river basins.
- To design methodologies and models to be applied for the management of water resources.
- To proceed reforestation projects.
- To make better use of marine resources.

(2) Lands Preparation

For the purpose of attaining a better use of lands and conducting an appropriate utilization of water resources, the following programs have been proposed to implement in 1987-1990.

- To carry out a total of 600 projects of small irrigation.
- To implement the Rehabilitation, Complementation and Expansion of Irrigation Districts Project financed by the World Bank. This project aims at constructing small and medium irrigation systems, while the construction of large scale irrigation system shall be made only when its feasibility for implementation is justified by economic and social evaluation.

- To formulate programs that will constitute incentives to attract investments of the private sector on the implementation of irrigation, drainage and flood control projects in such regions having high potentiality for producing exportable products.

(3) Agrarian Reform

With an eye to elevating of income among farmers and casual laborers, and to intensifying land use, the Government referred the Agrarian Reform Law to the Congress for consideration.

The lands to be acquired by INCORA shall be distributed, among others, to the following programs.

- To endow poor farmers, inhabitants of the regions suffering from frequent attack of natural disasters, and tenant farmers with lands divided into exploitation unit for families, cooperatives and associations.
- To prepare lands to indian communities.
- To rectify the land tenure structure in land preparation project areas conducted by public organizations and to endow HIMAT with required lands for the implementation of irrigation works.

During 1987-1990, the Government plans to acquire 470,000 hectares of land as well as to entitle a total of 3 millions of incultivated land to more than 100,000 families. The priority for carrying out agrarian reform programs shall be given in the following orders:

1. Areas included in the National Rehabilitation Plan
2. Areas where social conflicts are taken place
3. Areas where local economy is evidently stagnated and thus an economic crisis is forecasted in the medium term.

(4) Agrarian Credit

It is planned that credit resources for agricultural and fishery sector be prepared sufficient enough so that the increase in output of the sector could be achieved.

The agricultural credits shall be rendered, in their important portion, to small farmers, and with this regards, special quota will be established to the areas in which National Rehabilitation Plan is to be implemented.

(5) Investigation and Technology Transfer

In order to raise the contribution of technological aspect to the agricultural production and productivity the following strategies shall be taken up:

- To encourage the investigation and research on the development of appropriate productive cultures and on the planning of agricultural development programs to coordinate with ecological conditions.
- To strengthen national systems for research, technology transfer and agricultural extension, with emphasis laid on the decentralization and integration to the regional level; for this purpose, ICA will incorporate 60 Regional Centers for Extension, Training and Diffusion of Technology (CRECED).

(6) Prices of Inputs and Agro-products

The price policy on inputs aims at saving production cost, increasing their use, alleviating external dependence on their supply, and generating employment opportunity in the industrial sector. For this purpose, the government shall take the following measures, as given hereinunder.

- To promote the national production of agricultural inputs and the importation of used tractors and combines.
- To facilitate the installation of small mixing plants for fertilizers.
- To aim at stabilizing prices of agro-products by assigning more resources to the Fund for the Purchase of Harvested Products, fixing sustenance prices, and selling imported products through the canal of the National Agricultural Market.
- To develop price and market information system so as to attain better coordination between producers and consumers.

(7) Domestic Marketing System

- In view of developing storage, transformation and sale of agro-products, the Rural Commercialization Service Center shall be promoted. These centers, to be owned by farmers, will have functions to: store and dry grains; select, wash, pack and refrigerate crops; process products; sell input; hire machinery; and supply information on rices and marketing.
- The Ministry of Agriculture will coordinate the Training and Extension Program for post-harvest management method.
- To improve marketing system of meats and dairy products.
- For promoting the formation of cooperatives in commercialization of agro-products to intensify training and extension programs, and to establish credit lines for this purpose.
- To design programs oriented to incorporate an efficient and economical system of distribution (shops, shopping plaza, etc.)

(8) Foreign Trade

- Within the exportation promotion policy, an emphasis shall be laid on such non-traditional products as tropical fruits and marine products.
- ICA will encourage the investigation and technology transfer of exportable products and the Technological Research Institute (IIT) will take charge of programs for the post-harvest management of these products.
- With an objective of stabilizing exportation prices of agro-products, it is proposed to create a "price stabilization fund".
- In order to conduct an effective protection of domestic products of the agriculture sector, duties of 10% of CIF value shall be levied to IDEMA on their imported products.

(9) Coffee Policy

The core policy in the production of coffee is to maximize foreign exchange earnings arising from the exportation, and to promise reasonable income level for coffee growers; the former will be expected by means of the new quota system in the International coffee Organization (ICO) and the latter will be achieved by setting up domestic farm-gate price which might guarantee a stable income for coffee growers. For this purpose, the stock of coffee shall be maintained in a consistent level that the volume for exportation is taken account of.

So as to facilitate the renovation of aged coffee plants, a special credit program shall be incorporated. At the same time, the rust control for coffee leaves shall be promoted by Fedecafe.

(10) Special Programs for the Socio-economic Enhancement in Rural Area

For the enhancement of well-being in less developed rural areas, special programs consist of various components such as the construction of physical and social infrastructure, transfer of land, capital and technology, etc. shall be implemented.

1) Integrated Rural Development Programs

The legislative decree No. 77 of 1987 has changed the legal structure of Fondo-DRI into a public organization, that has been decided in view of co-financing with local governments and other public and private enterprises for the implementation of integrated rural development programs and projects.

The services for Fondo-DRI shall be extended to the assistance in production, enhancement of rural well-being and provision of productive infrastructure so that the poorest rural communities might be benefitted.

Fondo-DRI shall also take part in promotion and coordination for the formation of cooperatives among small farmers and retailers in rural area.

2) National Rehabilitation Plan (PNR)

This plan covers those areas to which services of Fondo-DRI are not extended, and in such areas as to be absent from institutional, social and political services.

The fundamental part of the present Plan includes to incorporate new productive zones by means of promoting colonization projects.

The preparation of lands for the Plan shall be conducted with financial resources assigned to ICA, INDERENA and HIMAT; the improvement of marketing system such as purchase of products with sustenance prices of IDEMA, provision of infrastructure, etc. shall be carried out through financial channel of IDEMA. Furthermore, a special credit line will be set up for beneficiaries of the Plan under the responsibility of Caja Agraria.

The total budget to realize the above-mentioned programs for the period 1987-1990 amounts to Col.\$273,000 million at constant price of 1987, of which 63% will be financed with resources included in the National Budget, 24% with foreign loans, and the remainder (11%) with proper resources of respective institution. The summary of the budget to implement programs quoted herewith is given in Table B.2.1.

B.2.2 Regional Development Plans and Programs

(1) Five Years Diversification Plans 1984-1989

The nationwide diversification plan in coffee growing zones in the country is conducted by the Fedecafe. The investment cost for the Plan is partly loaned by the World Bank. During 1984-1986, approximately Col.\$5,800 million was invested for the Plan, of which 78% was assigned to production, 12% to commercialization, and 10% to agro-industry.

The five years diversification plan 1984-1986 for the Department of Quindio was elaborated by the Coffee Committee within the context of "Development and Diversification Program" and it was approved by Fedecafe. The total project cost estimated by the Coffee Committee was at Col.\$2,258 million as of September, 1984.

The principal objectives of the diversification plan are to promote crop and animal husbandries in marginal zone for coffee production and to develop small-scaled crops cultivation in coffee farms. In line with these objectives the following plans composed of five fundamental and high-priority and other supplementary ones were formulated.

1) Plantain Development Plan

Plantain is the second most important crop in Quindio and the Department is considered to be one of the best regions for its production; the optimum altitude for planting plantain is between 1,000m to 1,500m and about half of the lands in Quindio exists within this category.

The target of the plan is to cultivate newly 1,200ha of lands, to improve 800ha of the existing ones, and to attain total output of 30 thousand tons in 5 years.

2) Fruits Development Plan

This plan focuses on the production of citrus (orange). The production of citrus is highly recommendable in Quindio, because a). the Department especially in such municipalities as Armenia, Montenegro, Calarca, La Tebaida and Quimbaya has optimum ecological conditions for the production of citrus, and b). the national consumption of orange per capita remains in 6kg/year - one of the lowest levels of the world.

The plan is promoted as an integrated development program with the participation of the departments of Valle del Cauca, Risaralda and Caldas.

The target of planting area comprises 3,000 ha for four departments, of which Quindio shares 900 ha. Apart from the production, a processing plant is envisaged to be installed near La Tebaida.

3) Livestock Development Plan

The livestock within Quindio has not been developed enough nor the improvement in pasture and animal raising is facilitated. In this connection, more than half of demand for meat and dairy products in Quindio is supplied from other departments. Consequently, the intensification of existing livestock activity and the incorporation of improved pasture is expected.

The plan aims at attaining the following targets:

Establishment of new meadow	: 1,000 ha
Improvement of existing meadow	: 1,000 ha
Raising of beef cattle	: 1,500 heads
Raising of dairy cattle	: 7,500 heads
Raising of cattle for double purpose	: 700 heads
Raising of calf	: 2,500 heads
Apiculture	: 1,500 colonies
Raising of pig	: 250 heads

4) Forestry Development Plan

Owing to the topographic condition, the Department of Quindio presents favorable perspective for the development of forestry in view of: a). producing wood and generating processing industry and b). protecting soils and water in the hydrographic basin.

The target of the plan is to carry out a reforestation project to cover a total of 5,600 ha of mountain areas existing in Circasia, Filandia, Calara, Pijao, Genova and Salento. Of this target area, 50% will be implemented under the responsibility of the Diversification Plan and the rest will be in charge of other institutions concerned.

5) Commercialization Development Plan

The success of the diversification program conducted by the Coffee Committee will be based on the preparation of efficient and adequate canals of marketing for proposed products. In the light of this, Coffee Committee has established strategies in each field of: a). investigation, b). distribution, c). production, d). storage, e). agro-industry, and f). specific projects. These strategies are prepared in compliance with those of the Central Government and Fedecafe.

6) Supplementary Plans

Apart from said five fundamental diversification plans, Coffee Committee proposes to carry out the following supplementary plans during 1984-1989:

- Cassava production
- Vegetable and fruits production
- Small industries
- Sericulture

7) Accomplishments of the Plan

Under the Diversification Program a total of 5,453 ha of lands has been newly cultivated in Quindio from October, 1984 to September, 1986. Main crops planted in this period are - plantain (2,576 ha), cassava (712 ha), sorghum (423 ha), citrus (254 ha), bean (167 ha) and tomato (73 ha). Additionally 100 ha of pasture and 623 ha of forest were developed in the same period.

(2) Integrated Rural Development (Fondo-DRI) Program

The Fondo-DRI Program in Quindio was started in July, 1986 in collaboration with C.R.Q. (coordinating organization) and Coffee Committee. Actually, under the Fondo-DRI Program the following sub-programs are being prepared.

1) Integrated of Small Basins Integrated Management

This sub-program plans to elaborate and to implement an integrated management of small basins so that the prevailing ecological balance could be maintained and, as a result, water with high quality could be supplied in the future. For this purpose, the construction of water supply pipe and other infrastructure shall be realized. Actually, in view of studying and evaluating the possibility of incorporating small-scaled agriculture in these basins some demonstrative farms have been established in some districts of Filandia, Salento and Genova.

2) Pisciculture Promotion Project

The promotion of pisciculture is proposed in marginal zone for coffee production. This is expected to contribute not only to enhance the living standard of farmers who are operating unstable crop husbandry with insufficient income, but also to ease the problem of under-nourishment.

A series of sampling of water has been carried out in Filandia and Genova so as to analyze physical and chemical quality of water for pisciculture. C.R.Q. has a pisciculture station in the forestal reservation area at Navarco; in this station annual production of 500,000 finger lings is expected in total of 13 rearing tanks. Furthermore, 10,000 specimen of "Mojarra Plateada" (*Oreochromis niloticus*) have been brought from a pisciculture station of Tolima so that sexual reversion might be realized.

(3) Vegetables and Fruits Production Promotion Project

This Project was formulated by the Bureau of Agriculture, Departmental Office of Quindio. The objective of the Project is to promote the production of vegetables and fruits which are accustomed to being consumed by the Quindian people. The description of the present Project is as given below.

1) Introducing Crops

Vegetables : Pea, Carrot, Beet, Lettuce and Cabbage
Fruits : Tree Tomato, Blackberry, Peach, "lulo", "curuba" and "breva".

2) Project Area

Marginal zone for coffee production; identification of each sub-project area will be determined according with topography, soils and rainfall conditions, and the availability of lands.

3) Selection of Beneficiary

Beneficiaries of the Project will be selected in accordance with the following criteria:

- Those who are small farmer.
- Those who and/or his family can work in the farm and can live in the estate of the farm.
- Those who have experience in cultivating proposed crops.
- Those who can participate in the association for facilitating commercialization of products.

4) Targets of the Project

	<u>1987</u>	<u>1988</u>
- Cultivating area	12 ha	24 ha
- Production (Volume)	375 ton	796 ton
(Amount)	Col.\$9,442,000	Col.\$33,000,00
- Beneficiary	20 families	35 families

(4) Agriculture Development Plan 1987-1990

The Agriculture Development Plan 1987-1990 has been prepared by the Directorate of Departmental Planning and the Regional Agricultural Planning Unit (URPA) within the Regional-National Agricultural Planning Project (UNDP/FAO/COL/83/012) conducted by the Agricultural Sector Planning Office, Ministry of Agriculture.

1) Targets

- To reduce importation of vegetables, fruits, cacao, bean, brown sugar, etc. from other departments of the country.
- To conserve domestic market and to conquer in medium term outside markets for such products as are produced in excess of departmental consumption.
- To incorporate a total of 2,710 ha of new farm to be assigned in its greater portion to the production of "lulo", tree tomato and sorghum.

2) Development Programs and Projects

- Agricultural land settlement project
- Investigation and utilization of inputs project
- Post-harvest products conservation program
- Rural extension program
- Mini-enterprises creation project
- Pasture improvement project in marginal areas for coffee production

- Poultry farming promotion program
- Swine farming promotion program
- Water culture cultivation promotion program
- Vegetables and fruits producers' cooperative supporting project
- Agro-industry promotion program
- Crop seeding and planting period adjustment program
- Brown sugar's producers integration project
- Herb tea cultivation project
- Experimental farm development project
- Plantain's producers association project
- Coffee and plantain technification program
- Soil analysis program

TABLE B.2.1 INVESTMENT PLAN FOR THE AGRICULTURAL SECTOR 1987 - 1990

Unit: In million of Col\$ at constant price of 1987

Organization and Programs	Budget 1987 - 1990			Total	%
	Government's Budget	Proper Resources	Foreign Loan		
1. <u>ICA</u>					
National Rehabilitation Plan (PNR)	4,856	741	700	6,298	
Agricultural Investigation	16,683	2,822	7,532	27,037	
Technology Transfer and Assistance	1,664	3,363	0	5,027	
Sanitation and Control of Inputs	6,598	2,723	1,055	10,377	
Social Development	2,367	1,423	1,395	5,186	
Debt Services	7,582	159	0	7,741	
Sub-total	<u>39,750</u>	<u>11,232</u>	<u>10,683</u>	<u>61,666</u>	<u>22.6</u>
2. <u>INCOIRA</u>					
PNR	28,972	516	0	29,487	
Physical and Social Infrastructure	620	5	0	625	
Acquisition, Award and Entitlement of Lands	1,707	4,609	0	6,316	
Agricultural Credit	128	8,761	0	8,889	
Training and Education of Farmers	10,345	425	0	10,770	
Debt Service	1,395	4,565	0	5,960	
Sub-total	<u>43,166</u>	<u>18,881</u>	<u>0</u>	<u>62,047</u>	<u>22.7</u>
3. <u>INDERENA</u>					
PNR	522	0	0	522	
Investigation	1,860	204	0	2,063	
National Park System	1,860	158	0	2,019	
Administration of PNR	3,552	519	221	4,292	
Environmental Management	2,953	236	0	3,189	
Other Investments	940	0	0	940	
Debt Service	1,315	29	0	1,344	
Sub-total	<u>13,003</u>	<u>1,146</u>	<u>221</u>	<u>14,370</u>	<u>5.3</u>
4. <u>HDMAT</u>					
PNR	5,320	0	0	5,320	
Infrastructure for Agricultural Production	18,797	2,133	14,620	35,550	
Hydrology and Meteorology	3,867	1,083	0	4,950	
Debt Service	8,312	2	0	8,314	
Sub-total	<u>36,296</u>	<u>3,218</u>	<u>14,620</u>	<u>54,134</u>	<u>19.8</u>
5. <u>IDEMA</u>					
PNR	2,903	0	0	2,903	
Improvement of Retailers' Market	240	0	0	240	
Sub-total	<u>3,143</u>	<u>0</u>	<u>0</u>	<u>3,143</u>	<u>1.2</u>
6. <u>ENCOPER</u>					
Plan and Study on Perishable Resources	20	246	0	266	
Storage Center	88	0	0	88	
Marketing Center	59	0	0	59	
Public Refrigeration System	127	0	0	127	
Sub-total	<u>295</u>	<u>246</u>	<u>0</u>	<u>541</u>	<u>0.2</u>
7. <u>Fond DRI</u>					
PNR	2,078	0	0	2,078	
Physical Infrastructure	7,591	0	14,643	22,235	
Social Infrastructure	7,133	0	11,664	18,797	
Marketing Assistance Service	2,605	0	2,219	4,824	
Production Assistance Service	12,013	0	4,509	16,522	
Others	2,593	0	912	3,505	
Sub-total	<u>34,014</u>	<u>0</u>	<u>33,947</u>	<u>67,961</u>	<u>24.9</u>
8. <u>MINISTRY OF AGRICULTURE</u>					
PNR	23	0	0	23	
Information and Processing Data	1,581	0	0	1,581	
Study and Planning	1,095	0	0	1,095	
Agricultural Promotion	900	0	0	900	
Technology Transfer	5,267	0	0	5,267	
Others	58	0	0	58	
Sub-total	<u>8,924</u>	<u>0</u>	<u>0</u>	<u>8,924</u>	<u>3.3</u>
TOTAL	178,593	34,723	59,471	272,787	100

Note: In the INCORA's cases foreign loan is included in the Government's Budget.

Source: Planes y Programas de Desarrollo Económico y Social 1987 - 1990
 Department Nacional de Planeación

B.3 SOCIO-ECONOMIC SITUATION OF FARMERS IN QUINDIO

B.3.1 Characteristics of Coffee Plantation in Quindio

The production of coffee, needless to mention, is the largest contributor to the quindian economy; it produced approximately Col.\$10,500 million, in 1984 equivalent to 66% of the total value added to crop production, and generated employment opportunity for more than 50,000 persons.

In the light of the importance of coffee production to the socio-economy of the Department, a survey on total coffee growers in Quindio was carried out by the Extension Service Sector of the Departmental Coffee Committee in 1983.

According to the said survey, the total number of coffee planting farm was 7,827; the major coffee production municipalities were Calarca (1,220 farms), Quimbaya (1,047 farms) and Filandia (1,027 farms), while the minor municipalities were Buenavista (232 farms), La Tebaida (235 farms) and Salento (243 farms). Small farms with holdings less than 5 ha represented 40%, and large farmers with holdings more than 30 ha accounted for 9% of the total number of farms. The highest distribution of small farmers was found in Circasia (59%) and that of large farmers was in La Tebaida (21%). The share of coffee production in the total farm area was 70% on the average; in Salento, Montenegro and La Tebaida this share was reduced to below 60%. The proportion of intensified farm was around 56%--the highest in Quimbaya (70%) and the lowest in Salento (21%). Other relevant information on this issue is given in TABLES B.3.1 and B.3.2.

B.3.2 Survey on Coffee Production

(1) Introduction

For the purpose of getting acquainted with up-to-date and vivid information, a survey on coffee production by means of direct interview to growers has been conducted by the Study Team. The questionnaire used for this survey is composed of six main temas: 1) General Information on Interviewee, 2) Production, Income and Cost for Farming, 3) Cropping Technique, 4) Intention of Farmers on the Future Operation of Their Farms, 5) Coffee Processing Method, and 6) Influence of "Leaf Rust" on Coffee Production.

For the selection of the interviewees, the Study Team referred to the information on the distribution of coffee farms by size and by municipality as of 1982 prepared by Coffee Committee.

In proportion with the number of coffee plantation farms presented in the said information, the following number of coffee growers was interviewed.

DISTRIBUTION OF INTERVIEWEE BY MUNICIPALITY
AND BY FARM SIZE

Municipalities	Farm Size					Total
	5	5 < 10	10 < 20	20 < 30	30 <	
Armenia	8 (341)	7 (239)	3 (134)	2 (54)	3 (101)	23 (869)
Buenavista	2 (48)	0 (79)	2 (64)	2 (26)	1 (15)	7 (232)
Calarca	14 (506)	8 (365)	4 (174)	2 (78)	2 (97)	30(1,220)
Circasia	12 (530)	3 (215)	8 (94)	0 (29)	3 (24)	26 (892)
Cordoba	2 (62)	1 (93)	0 (57)	3 (25)	1 (33)	7 (270)
Filandia	13 (537)	7 (305)	4 (129)	1 (28)	1 (28)	26(1,027)
Genova	5 (127)	2 (202)	5 (148)	1 (53)	4 (66)	17 (596)
La Tebaida	2 (54)	0 (50)	3 (43)	0 (38)	0 (50)	5 (235)
Montenegro	7 (231)	7 (190)	4 (173)	1 (65)	1 (96)	20 (755)
Pijao	1 (57)	3 (134)	3 (130)	1 (44)	3 (76)	11 (441)
Quimbaya	13 (512)	5 (227)	3 (167)	0 (61)	2 (80)	23(1,047)
Salento	3 (107)	5 (80)	1 (42)	0 (8)	0 (6)	9 (243)
Total	82(3,122)	48(2,179)	40(1,355)	13(509)	20(672)	203(7,827)

Note: Figures in parenthesis represent the number of coffee farms surveyed by the coffee committee as of 1982.

(2) Social Conditions of Coffee Growers

A strong trend in rural-urban migration prevails in the Department of Quindio and five (Buenavista, Cordoba, Genova, Pijao and Salento) municipalities showed negative population growth for the period 1973 - 1985.

As a result of this phenomenon, the coffee cultivation in Quindio is carried out by relatively older growers: the average age among interviewed farmers is 54.0 years old; according to the survey conducted by Coffee Committee, 78% of the total number of coffee growers are older than 40 years, of which 24% are older than 60 years.

The afore-mentioned out-migration trend from where is caused partially by the desertion of coffee growers their farms are located. In five municipalities with negative population growth, only 39% of interviewed farmers live in their farms; it is assumed that these farmers live in urban area of municipalities to which their farms belong, Armenia and other big cities such as Bogota, Cali, Pereira, etc.

Owing to the satisfactory attention by Coffee Committee, social infrastructure is adequately provided to coffee growers. Apart from supporting services to coffee production such as technical assistance, extension, marketing, credit, inputs supply, the Committee is also responsible for providing domestic water supply, sewer, electric supply system, schools and medical care center. Consequently, the survey of the Committee indicates that only 3.5% of the total number of coffee growers in Quindio had access to neither domestic water supply nor electric system as of 1982.

(3) Landuse

The average hectarage of land owned by interviewees is 12.1 has, of which 8,9 has (72.4%) is occupied by coffee plantation. Less than half--approx. 4 ha--of coffee plantation is represented by new and/or stumped trees. Almost half of coffee growers produces plantain intercropping with coffee and other crops cultivated in their farms are: cassava, citrus, kidney bean, corn, avocado, and so forth. Approximately 60% (2.1 has) of non-coffee productive lands is used as grazing lands and forest.

(4) Output and Marketing

Under normal circumstances, coffee is harvested twice a year. In such municipalities with relatively higher altitude as Armenia, Buenavista, Calarca, Circasia, Cordoba, Filandia, Genova, Pijao and Salento, the primary harvest season falls in March through June and the secondary in October through December, and the vice versa in La Tebaida, Montenegro and Quimbaya. The annual output per grower is at 9.81 tons, of which 79% is produced in primary harvest season.

The nominal unit yield per hectare of land with coffee plantation is 1.07 ton/year and, if new plantation area without harvest is excluded, the level of unit yield reaches to 1.26 ton/ha/year. Land productivity of coffee farm varies according to farm size, which is as summarized below:

<u>Farm Size Category</u> (ha)	<u>No. of Farms</u>	<u>Average Unit Yield</u> (ton/ha/year)
0 - 5	82	1.07
5 - 10	48	1.10
10 - 20	40	1.52
20 - 30	13	1.83
30 -	20	1.53
<u>Total</u>	<u>203</u>	<u>1.26</u>

After having been harvested in farms grains are taken off their pulps and dried by farmers themselves excepting a few growers who entrust a cooperative to process their products. Then, parchimentized coffee is sold to the Almacafe or threshing factory through cooperatives of coffee growers or private brokers (deposito de cafe). Coffee's farm-gate price is fixed by Fedecafe. The prevailing price of Col.\$330.00/kg (Col.\$41,250/carga) was set on October 24, 1986. The farm-gate price, although it had been revised at least twice a year since 1980 (See Fig. B.3.1), has not been increased for more than one year. The price varies according with quality and the average one obtained among interviewed coffee growers was at Col.\$294.41/kg for the year of 1986.

(5) Production Cost

Besides initial investment required for land preparation and purchase of seed or stumping, a major portion of the coffee production cost is spent on labor recruitment. The survey by the Study Team revealed that one farmer employs yearly 14.4 workers-- 2.6 permanently and 11.8 occasionally. In general, permanent workers are engaged in routine works as such as weeding, application of fertilizers and pesticide, etc., and occasional ones in harvesting; the former is employed on fixed wage basis and the latter on a contract basis.

Taking no account of the initial investment referred to before, the labor cost occupies around 85% of the total annual production cost. The remainder of the production cost is distributed to inputs (9.6%), interest of credit (4.4%), and others (0.9%).

Less participation of inputs supply within the context of production cost is meant that the degree of intensification for coffee production in Quindio remains in lower level. This is due to partly inadequate provision of credit services which constituted major source of complaint among farmers. As Table B.3.4 indicates, about 70% of coffee growers had access to credit services and an average amount of loan rendered to them was Col.\$5,000. The interest set for a loan varies by amount and by term and the majority of it falls in the range of 20 - 24%. No less than 85% of the total amount of credit to farmers was given by Caja Agraria and the Banco de Cafetero. Coffee Committee of Quindio also has credit line to small farmers with lower interest rate - 6% per year, but it represented only 2.5% of the total production cost.

(6) Balance in Coffee Production and Farmer's Surplus

Coffee growers in Quindio got Col.\$638,000 of a net income from coffee production in 1986, which, in turn, implies that per hectare of land dedicated to coffee production contributed to earn Col.\$69,000 of net profit in a year.

Apart from coffee, 35% of coffee growers had a supplementary income from crop and animal husbandries; most of them earned this income by selling plantains intercropped with coffee. In addition, commerce and off-farm labor constitute another source of income for one-fourth of interviewees. On an average, the amount of an annual net income derived from activities out of coffee production reached to Col.\$438,000, which accounted for 40% of the total sum of a net income.

The table below summarizes gross and net returns to farmers on coffee production, net returns to them from other farm and off-farm activities, and farmers' surplus.

1. Coffee Production

Production Volume	9.81 ton/year
Farm-gate Price	Col.\$294.41/kg
Gross Return	Col.\$2,888,000/year
Cost	Col.\$2,250,000/year
Net Return	Col.\$638,000/year

2. Net Return by other farming activities

Col.\$91,000/year

3. Net Return by off-farm activities

Col.\$347,000/year

4. Total Net Return

Col.\$1,076,000/year

5. Living Cost

Col.\$540,000/year

6. Farmer's Surplus

Col.\$536,000/year

(7) Intention of Coffee Growers on Future Farm Management

With respect to coffee growers' intention on the future management of their farms, an overwhelming majority (96.6%) of the sampled farmers replied that they would continue crop husbandry. In addition, close to one-third of them expressed that they would like to expand their farm in future.

In spite of the positive intention on future farming activity, there are not a few (20%) farmers who are not satisfied with present coffee production; major causes of this dissatisfaction are relevant to low income level that is associated with low productivity, higher cost of inputs and credit, and inferior workmanship of employed laborers. Furthermore it will be worth of pointing out that a greater portion of interviewees answered that they are satisfied with coffee production not because it produced good benefit but because they got a livelihood on it.

Pertaining to the diversification of a cropping pattern, as low as 16% of sampled coffee growers manifested their interest in cultivating new crops. This inclination is summarized in the following manner:

1) New crops to be introduced

<u>Crops</u>	<u>No. of Samples</u>
Tomato	8
Kidneybean	7
Fruits (not specified)	5
Cassava	4
Corn	4
Cacao	3
Orange	3
Others (Sunflower, Plantain, Avocado, Tree Tomato, etc.)	

2) Reasons for an inclination

<u>Reasons</u>	<u>No. of Samples</u>
- More benefit is expected	12
- Benefit is generated earlier	3
- Sales channel is guaranteed	3
- Easy to cultivate	2
- Climate is favored	2

3) Reasons for not having cultivated new crops up to date

<u>Reasons</u>	<u>No. of Samples</u>
- Lack of financial resources	15
- Land is not available	3

The above survey result concludes that most of farmers in Quindio is inclined to undertake traditional crops that promise higher income and marketing channel.

(8) Influence of Leaf Rust

The leaf rust ("roya") began to appear in Quindio in 1984 and it constitutes one of the most serious problems that production of coffee confronts. According to the survey, the disease is spread over almost the whole of coffee plantations in the Department; nearly 70% of coffee trees is attached by it, and the production is reduced for 48% of sampled coffee growers.

Under the circumstances, the control of the leaf rust came to the primary concern to Fedecafe, so an extensive campaign is under way by the initiative throughout the country. In the regional level, supporting services are rendered to coffee growers both in technical and financial aspects through the extension service division of Coffee Committee and two-thirds of coffee growers are satisfied with these services. Owing to Coffee Committee's devoted attention, additional cost pertaining to the control of the leaf rust was incurred for only 11% of sampled farmers.

(9) Observations

As a result of the survey on coffee production to have been conducted by means of a direct interview to a total of 203 coffee growers in Quindio, the following observations have been presented.

- 1) In comparison with the rest of the country, rural population in Quindio is benefitted with better social services such as provision of water supply, sewers, electric system that are rendered in their great portion by Coffee Committee.
- 2) A distinctive feature of a coffee production in Quindio is an existence of a number of enterprising farmers who live in urban area with routine off-farm activities and entrust farming activities to employed administrator and laborers.
- 3) On the other hand, there are many small coffee growers, because:
 - Sons of farmers receive a portion of a farm for constructing their houses and cultivating coffee or other crops;
 - They have an access to another sources of income working in farms outside theirs;
 - The production of coffee is profitable enough to carry out in relatively small lot.
- 4) Coffee cultivation is conducted by older farmers who follow traditional cropping practice. This phenomenon has caused to delay the development of intensifying farmland that requires an introduction of high yield varieties and an application of more inputs.
- 5) The lack of an adequate service for lending agricultural loan is another cause that can not support coffee growers to invest for renovating their farms.
- 6) By forming cooperatives, coffee growing farmers in the region are free of problems with respect to marketing their products.
- 7) Despite coffee is not the most profitable crops, many farmers are persistent in cultivating it due to an inadequate provision of institutional services in relation to:
 - teaching and extending cropping technology of non-traditional crops;
 - ameliorating marketing channel; and
 - rendering financial assistance with favored conditions.

- 8) The perspective of coffee production in future is not necessarily favorable; the farm-gate price, correlated with the stagnation of price in the international market has been maintained without being raised for more than one year since last October, and the productivity is currently affected by the appearance of the leaf rust and will be on the verge of being deteriorated by the arrival of the "Broca" - an insect to damage coffee's fruit badly.

B.3.3 Survey on Crop Production other than Coffee

In addition to coffee, the survey to cover 8 major crops being produced Quindio was conducted by the Study Team in the following manner:

<u>Crops</u>	<u>No. of Samples</u>	<u>Locations</u>
Cacao	4	Armenia, Calarca, Montenegro
Cassava	6	Armenia, Calarca, Quimbaya
Orange	3	Armenia, Cordoba, La Tebaida
Plantain	6	Montenegro, Quimbaya
Potato	7	Salento
Sorghum	3	La Tebaida, Montenegro
Soybean	3	La Tebaida, Quimbaya
Tomato	5	Armenia, Calarca, La Tebaida
<u>Total</u>	<u>37</u>	

These crops are produced because farmlands are not apt for coffee production or the production of which can be expected higher benefit together with guaranteed marketing channel.

The result of the survey is given in Tables B.3.8 and B.3.9, but it should be drawn attention that, on account of limited time allowable for conducting the survey, the number of samples collected for respective crop is too scarce to represent the whole of farmers who are engaging in the production of sampled crops. Consequently, the survey result should be read as a reference. The balance of production for each crop is as summarized below:

	Cacao	Cassava	Orange	Plantain	Potato	Sorghum	Soybean	Tomato
1. Planted Area (ha)	6.48	11.14	12.22	2.47	9.95	60.13	16.67	2.61
2. Output (ton)	3.23	146.64	241.08	6,900	91.33	221.25	47.34	3,200
3. Unit Yield (ton/ha)	0.50	13.15	19.72	1,543	9.19	3.68	2.84	1,226
4. Price (Col.\$)	380	35	24	238	39	51	99	810
5. Gross Return (Col.\$ x 10 ³)	1,227	5,121	5,786	1,642	3,562	11,284	4,687	2,592
6. Production Cost (Col.\$ x 10 ³)	488	1,949	2,879	553	1,671	10,136	4,253	1,080
7. Net Return (Col.\$ x 10 ³)	739	3,172	2,907	1,089	1,891	1,148	434	1,512
8. Net Return per ha (Col.\$ x 10 ³)	114	284	230	244	190	19	26	579

According to the above survey result, of eight selected crops, six (cacao, cassava, orange, plantain, potato and tomato) are more profitable than coffee in terms of per unit of land.

The Table B.3.9 resumes farmers' intention on future management of their farm. Supported by high profitability, a major portion of sampled farmers manifested their satisfaction with actual crop production, and they affirmed their will to continue it; so far as the case of cassava, half of the interviewees answered negatively, but it is because the cultivation of the crop can not be recommended to continue in the same farm for a long time due to its degrading soil fertility.

TABLE B.3.1 NUMBER OF COFFEE FARMS BY MUNICIPALITY AND BY SIZE

Municipalities	Farm size (ha)														Total Planted Area (ha)	Unit Area per Farm (ha)
	5		10		20		40		30		Total					
	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%				
Armenia	341	39.2	239	27.5	134	15.4	54	6.2	101	11.7	869	11.1	8,278	12.7	9.5	
Buenavista	48	20.7	79	34.1	64	27.6	26	11.2	15	6.4	232	3.0	2,634	4.0	11.4	
Calarcá	506	41.5	365	29.9	174	14.3	78	6.5	97	7.9	1,220	15.6	9,633	14.8	7.9	
Circasia	530	59.4	215	24.1	94	10.5	29	3.3	24	2.7	892	11.4	3,987	6.1	4.5	
Córdoba	62	23.0	93	34.4	57	21.1	25	9.3	33	12.2	270	3.4	3,460	5.3	12.8	
Filandia	537	52.3	305	29.7	129	12.6	28	2.7	28	2.7	1,027	13.1	5,335	8.2	5.2	
Génova	127	21.3	202	33.9	148	24.8	53	8.9	66	11.1	596	7.6	6,065	9.3	10.2	
La Tebaida	54	22.9	50	21.3	43	18.3	38	16.2	50	21.3	235	3.0	3,117	4.8	13.3	
Montenegro	231	30.6	190	25.2	173	22.9	65	8.6	96	12.7	755	9.6	7,373	11.3	9.8	
Piaja	57	12.9	134	30.4	130	29.5	44	10.0	76	17.2	441	5.6	5,395	8.3	12.2	
Quimbaya	512	48.9	227	21.7	167	16.0	61	5.8	80	7.6	1,047	13.4	8,630	13.3	8.2	
Salento	107	44.0	80	32.9	42	17.3	8	3.3	6	2.5	243	3.1	1,133	1.7	4.7	
Total	3,112	39.8	2,179	27.8	1,355	17.3	509	6.5	672	8.6	7,827	100	65,040		8.3	

Source: DIAGNOSTICO PRELIMINAR DE LA ZONE CAFETERA DEL QUINDIO
COMITE DEPARTAMENTAL DEL QUINDIO, 1983

TABLE B.3.2 PROPORTION OF INTENSIFIED FIELD BY MUNICIPALITY

Municipality	Improved Variety		Traditional Variety		Total Area (ha)
	Area (ha)	%	Area (ha)	%	
Armenia	5,438	65.7	2,840	34.3	8,278
Buenavista	1,221	46.4	1,413	53.6	2,634
Calarca	4,699	48.8	4,934	51.2	9,633
Circasia	1,678	42.1	2,309	57.9	3,987
Cordoba	1,637	47.3	1,823	52.7	3,460
Filandia	2,991	56.1	2,344	43.9	5,335
Genova	1,817	30.0	4,248	70.0	6,065
La Tebaida	2,460	78.9	657	21.1	3,117
Montenegro	5,304	71.9	2,069	28.1	7,373
Pijao	2,203	40.8	3,192	59.2	5,395
Quimbaya	6,837	79.2	1,793	20.8	8,630
Salento	243	21.4	890	78.6	1,133
TOTAL	36,258	56.2	28,512	43.8	65,040

TABLE B.3.3 GENERAL INFORMATION ON COPPER PRODUCTION SURVEY (1)

Items	Municipalities											Total	
	Armenia	Buenavista	Calarca	Circasia	Cordoba	Pilandia	Genova	La Tebaida	Montenegro	Pijao	Quimbaya		Salento
1. Number of Coffee Farms	869	232	1,220	892	270	1,027	596	235	755	441	1,047	243	7,927
2. Number of Interviewees	23	7	30	26	7	26	17	5	20	11	22	9	293
3. Average Age of Interviewees	49.8	47.1	53.0	51.8	47.7	52.5	55.5	48.0	51.1	53.7	48.7	54.4	54.0
4. Average Number of Family Member	7.2	5.6	6.2	6.6	5.6	7.5	5.8	6.8	5.9	7.8	7.5	7.8	6.7
5. Average Year of Experience Agriculture	37.3	28.1	23.8	22.7	26.4	30.0	33.1	13.6	28.3	32.9	28.3	30.0	28.5
6. Percentage of Interviewees Living in Rural Area	91.3	28.6	53.3	69.2	57.1	84.6	29.4	40.0	60.0	27.3	77.3	66.7	63.0
7. Land Use (Haa)													
Coffee Production	8.4	17.3	9.0	7.0	17.4	5.7	12.9	7.8	6.3	20.1	8.0	5.1	9.2
Other Use	2.3	1.8	2.7	2.6	1.5	2.0	6.2	3.0	2.7	13.1	1.4	1.8	3.2
Total	10.7	19.1	11.7	9.6	18.9	7.7	19.1	10.8	9.0	33.2	9.4	6.9	12.4
8. Production (ton)													
Primary Harvest	6.69	16.64	10.95	3.65	11.80	4.37	9.78	7.25	2.69	18.89	8.58	3.24	7.74
Secondary Harvest	2.80	5.29	1.87	1.63	4.16	0.59	1.42	1.75	1.82	4.01	2.73	0.16	2.07
Total	9.79	21.93	12.82	5.28	15.96	4.96	11.20	9.00	4.51	22.90	11.31	3.40	9.81
9. Unit yield (ton/ha/year)													
Nominal (including New Plantation)	1.17	1.27	1.42	0.75	0.92	0.87	0.87	1.15	0.72	1.14	1.41	0.67	1.07
Real (excluding New Plantation)	1.32	1.51	1.89	1.02	1.15	1.08	1.02	1.27	0.82	1.24	1.59	0.74	1.26
10. Farm-Gate Price Col\$/kg	293.13	297.71	303.96	302.89	307.54	276.97	265.56	302.30	297.65	293.0	291.64	297.77	294.41
11. Gross Return Col\$1,000/year	2,870	6,529	3,897	1,599	4,908	1,374	2,974	2,721	1,342	6,710	3,298	1,012	2,888

TABLE B.3.3 GENERAL INFORMATION ON COFFEE PRODUCTION SURVEY (2)

Items	Municipalities										Total		
	Armenia	Buenavista	Calarca	Circasia	Cordoba	Filandia	Genova	La Tebaida	Montenegro	Pijao		Quimbaya	Salento
12. Production Cost													
1) Labor	2,403	2,177	2,230	621	3,044	924	3,749	1,654	870	4,530	2,077	498	1,913
2) Inputs	139	353	373	122	329	82	468	278	88	367	173	64	217
3) Interest	28	188	164	75	115	80	131	105	39	258	81	26	99
4) Others	43	153	8	8	7	9	27	8	11	16	17	15	21
Total	2,613	2,871	2,775	826	3,495	1,095	4,375	2,045	1,008	5,171	2,348	603	2,250
13. Net Return (11 - 12)													
Col\$ 1,000/year	257	3,658	1,122	773	1,413	279	-1,401	676	334	1,539	950	409	638
(Col\$/ha)	(31)	(211)	(416)	(110)	(81)	(49)	(-109)	(87)	(53)	(77)	(119)	(801)	(69)
14. Net Income Out of Coffee													
1) Farming Activities	382	109	30	6	88	3	16	274	79	117	96	56	91
2) Off-farm Activities	402	814	342	248	-	147	1,550	530	28	379	22	89	347
Total	786	923	372	254	88	150	1,566	904	107	496	118	145	438
15. Living Cost	458	688	570	546	557	403	695	752	533	640	412	448	540
16. Farmer's Surplus (13 + 14) - 15	585	3,898	924	481	944	26	-530	828	-92	1,395	556	106	536

TABLE B.3.4 FABRER'S ACCESS TO CREDIT LINE

Items	Municipalities										Total		
	Armenia	Buenavista	Calarca	Circunha	Cordoba	Piñandla	Genova	Tebalida	Montenegro	Piñon		Quiaboya	Salento
1. Percentage of User in Credit (%)	45.8	100	83.3	76.9	100	65.4	76.5	80.0	35.0	90.9	78.3	55.6	70.3
2. Average Amount of Credit (In thousand of Col\$)	138	921	1,090	436	1,144	596	599	598	533	1,717	568	224	704
3. Participation by Institution (%)													
1) Caja Agraria	68.7	35.6	38.5	54.4	49.2	93.7	43.3	20.5	77.2	24.0	27.0	88.9	45.2
2) Banco de Cafeteros	5.4	36.7	45.8	41.2	22.5	0.9	49.4	71.1	13.4	56.2	61.1	-	39.8
3) Comité de Cafeteros	17.9	0.2	0.1	0.3	0.2	5.3	-	8.4	9.4	-	7.0	11.1	2.5
4) Various Banks	-	1.7	6.2	1.7	-	-	-	-	-	17.5	-	-	4.6
5) Others	8.0	25.7	9.4	2.2	28.1	-	7.3	-	-	2.3	4.9	-	7.8
4. Credit Period (Year)	1-10	2-10	0.75-10	1-8	0.5-6	0.5-10	0.25-6	1-6	0.5-5	1-8	1-14	-	1-2
5. Interest (% per year)	18-27	21-30	18-36	20-36	21-36	21-36	14-36	9-30	20-24	21-40	15-36	-	23-36

TABLE B.3.5 PROPORTION OF FARMERS WHO GET INCOME OUT OF COFFEE PRODUCTION

Items	Municipalities											Total	
	Armenia	Buenavista	Calarca	Circasia	Cordoba	Filandia	Genova	La Tebaida	Montenegro	Pijao	Quimbaya		Salento
1. Farming Activities													
1) Crop Production	41.7	57.1	33.3	3.8	57.1	3.8	17.6	40.0	40.0	18.2	69.6	14.3	30.0
2) Livestock	-	-	-	7.7	14.3	-	11.8	-	5.0	45.5	-	42.9	5.4
Sub-total	41.7	57.1	33.3	11.5	57.1	3.8	23.5	40.0	40.0	54.5	69.6	57.1	35.0
2. Off-farm Activities													
1) Employ	20.8	14.3	13.3	15.4	-	11.5	-	-	50	27.3	-	14.3	10.8
2) Commerce and Others	12.5	28.6	16.7	7.7	-	19.2	29.4	60.0	5.0	54.5	4.3	-	14.8
Sub-total	29.2	42.9	26.7	23.1	-	30.8	29.4	-	10.0	63.6	4.31	14.3	24.6
Total	58.3	57.1	50.0	30.8	57.1	30.8	41.2	80.0	40.0	72.7	69.616	71.4	46.3

TABLE B.3.6 FARMERS' INTENTION ON FUTURE MANAGEMENT ON COFFEE PRODUCTION

Items	Municipalities										Total (%)	
	Armenia	Bucharista	Calarsa	Ciracela	Cordoba	Filadelfa	Genova	La Tebaida	Kratiswago	Majbo		Quimbaya
1. Intention to continue crop husbandry in future												
1) Affirmative	22	7	29	24	6	24	17	5	20	22	9	296 (96.6)
- To expand actual farm size	(4)	(4)	(13)	(7)	(3)	(6)	(6)	(1)	(3)	(6)	(1)	(59)
- To maintain actual farm size	(17)	(3)	(16)	(17)	(3)	(17)	(11)	(4)	(17)	(4)	(8)	(134)
- To reduce actual farm size	(1)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(1)	(0)	(2)
2) Negative	1	0	1	2	1	2	0	0	0	0	0	8 (2.4)
2. Satisfaction with coffee production												
1) Affirmative	20	7	18	19	4	18	12	3	18	10	21	157 (77.3)
2) Negative	3	0	12	7	3	8	5	2	2	1	2	46 (22.7)
3. Intention to convert coffee into other crops												
1) Affirmative	6	1	3	4	2	3	7	2	0	2	1	33 (16.3)
2) Negative	17	6	27	22	5	23	10	3	20	9	8	170 (83.7)
4. Sources of problem on actual coffee production												
1) Small land size	2	1	2	0	0	0	2	0	0	1	0	8 (3.9)
2) Laborers employed	2	4	12	7	1	8	4	2	4	3	5	53 (26.1)
3) Lack of machinery	1	2	3	1	2	1	4	0	0	3	0	18 (8.4)
4) Low productivity	0	2	7	7	4	2	4	2	0	3	1	32 (15.8)
5) Insufficient water	1	1	0	4	0	1	2	2	1	2	1	14 (6.9)
6) Steep and undulating land	1	5	2	3	2	0	13	0	0	7	0	33 (16.3)
7) In adequate road network	1	1	0	0	3	1	7	0	0	3	0	16 (7.9)
8) Soil capability	1	0	1	0	0	0	2	0	0	0	2	6 (3.0)
9) Credit service	3	4	7	10	6	4	8	2	2	5	2	57 (28.1)
10) High cost of inputs	10	6	16	17	6	3	4	2	8	6	9	91 (44.8)

TABLE B.3.7 INFORMATION ON LEAF RUST - "ROYA"

Items	Municipalities				Total (%)							
	Armenia	Buonavista	Calarca	Circacia		Cordoba	Filandia	Genova	La Tebaida	Montenegro	Piñero	Quimbaya
1. Appearance of leaf rust												
1) Yes	23	7	30	26	7	26	n.a.	4	19	10	23	9
2) No	0	0	0	0	0	0		1	1	1	0	0
3) Appeared since (Year)	1985	1984	1984	1985	1985	1984		1985	1985	1985	1985	1985
3) Proportion of plants affected	50%	60%	74%	69%	78%	76%		72%	81%	58%	66%	65%
2. Support of Coffee Committee												
1) Sufficient	16	3	16	14	3	14	n.a.	3	17	6	16	7
2) Insufficient	7	4	12	9	4	9		1	2	3	7	2
3. Influence on Production												
1) Not affected	17	2	13	9	3	13		1	7	5	10	6
2) Reduced	5	5	15	17	3	10		3	10	4	13	3
3) Not specified	1	0	2	0	1	3		3	3	1	0	0
4. Influence on Production Cost												
1) Additional labor cost												
- Yes	5	4	5	1	2	0	n.a.	0	0	3	0	0
- No	18	3	22	24	5	23		4	19	7	23	7
2) Additional inputs												
- Yes	7	4	5	1	2	0		0	0	1	0	0
- No	16	3	22	24	5	23		4	19	9	23	7

TABLE B.3.8 SURVEY ON CROP PRODUCTION OTHER THAN COFFEE

Item	Group	Cacao	Cashava	Orange	Plantain	Potato	Sorghum	Soybean	Tobacco
1. No. of Samples		4	6	3	6	7	3	3	5
2. Locations									
Armenia	(1)	(2)	(1)						(2)
Calarcá	(1)	(3)	(1)						(2)
Cordoba			(1)						
La Tebaida			(1)				(2)	(1)	
Montenegro	(2)	(1)	(3)				(1)	(2)	
Quimbaya			(3)			(7)			
Sajento									
3. Average Age of Sampled Farmers		37.8	34.3	37.3	47.7	42.9	39.3	39.7	35.6
4. No. of Family Member		5.3	2.7		7.3	5.6	3.0	3.7	
5. Employment of Laborer									
- Permanent		1.3	9.3	10.7	5.2	3.4	2.0	8.3	19.4
- Occasional		0.3	46.7	30.0	15.2	3.3	5.3	22.0	21.0
Sub-total		1.6	56.0	40.7	20.4	6.7	7.3	30.3	40.4
6. Planted Area (Ha)		6.48	11.14	12.22	4.47	9.95	60.13	16.67	2.61
7. Output (Ton)		3.23	146.44	241.08	6,900 1)	91.33	221.25	47.34	3,200 2)
8. Unit yield (Ton/ha)		0.50	13.15	19.72	1,543 1)	9.19	3.68	2.84	1,226 2)
9. Farm-gate Price (Col\$/kg)		380	35	24	238 3)	39	51	99	210 4)
10. Gross Return (Col\$1,000)		1,227	5,121	5,786	1,642	3,562	11,284	4,687	2,592
11. Production Cost (Col\$1,000)									
1) Labor cost		294	980	410	252	908	3,816	2,839	556
2) Inputs		147	153	1,222	91	474	3,612	591	338
3) Others		47	816	1,247	210	289	2,708	823	66
Sub-total		488	1,949	2,879	553	1,671	10,136	4,253	1,080
12. Net Return (Col\$1,000)									
- Global		739	3,172	2,907	1,089	1,891	1,148	434	1,512
- Per hectare		114	284	238	244	190	19	26	579

Note: 1) Clusters, 2) Boxes, 3) Col\$/cluster, 4) Col\$/box

TABLE B.3.9 FARMER'S INTENTION OF FUTURE MANAGEMENT FOR CROP PRODUCTION OTHER THAN COFFEE

Items	Cocoa	Cassava	Orange	Plantain	Potato	Sorghum	Soybean	Tomato
1. Intention to continue crop husbandry in future								
1) Affirmative	4	3	3	5	7	4	2	4
- To expand actual farm size	(1)	(1)	(2)	(-)	(-)	(2)	(-)	(2)
- To maintain actual farm size	(3)	(2)	(1)	(5)	(7)	(1)	(2)	(1)
- To reduce actual farm size	(-)	(-)	(-)	(-)	(-)	(1)	(-)	(1)
2) Negative	0	3	0	1	0	0	1	1
2. Satisfaction with actual crop husbandry								
1) Affirmative	4	5	2	6	6	3	1	4
2) Negative	0	1	1	0	1	1	2	1
3. Intention to convert actual crop into other crops								
1) Affirmative	1	3	-	2	2	1	1	3
2) Negative	3	3	3	4	5	3	2	2
4. Sources of problem on actual crop production								
1) Small land size	2	-	-	-	-	-	-	-
2) Laborers employed	-	-	-	-	-	1	-	-
3) Lack of machinery	-	-	1	-	-	1	1	-
4) Low productivity	-	-	1	1	-	-	-	1
5) Insufficient water	-	-	-	-	-	-	-	-
6) Steep and undulating land	-	-	-	-	1	-	-	-
7) Inadequate road network	-	-	-	-	-	-	-	-
8) Soil capability	1	-	1	-	-	-	-	-
9) Credit service	1	-	1	-	-	-	-	-
10) High cost of inputs	1	-	-	3	4	1	1	-

B.4 AGRICULTURAL INSTITUTIONS AND SUPPORTING SERVICES

B.4.1 Coordinating Agency

In national level, agricultural services fall within the general responsibilities of the Ministry of Agriculture. The Ministry takes charge of management and control of renovational natural resources, and supervises all institutions related to the implementation of the government's policy for the development of agricultural sector.

The technical aspects of the Ministry are managed by the Planning Office of the Agricultural Sector--OPSA, which has the following functions:

- To prepare specific programs and projects for the development of the sector and to coordinate and evaluate their implementation.
- To give advice to related institutions to prepare their programs and projects including budgetary arrangement.
- In collaboration with related organizations, to prepare annual budget of the sector.
- To study and investigate for the stabilization of prices for agricultural products and inputs.

Under the supervision of the Ministry of Agriculture, the following public institutions are operating in respective field of specialization.

- Colombian Institute of Agriculture and Livestock (ICA)
- Colombian Institute for Agrarian Reform (INCORA)
- Colombian Institute of Hydrology, Meteorology and Land Preparation (HIMAT)
- Institute of Natural Resources (INDERENA)
- Integrated Rural Development Fund (Fondo-DRI)
- Institute of Agriculture and Livestock Market (IDEMA)
- Agrarian, Industrial and Mineral Credit Bank (Caja Agraria)
- Colombian Enterprise on Commercialization of Perishable Products (ENCOPER)

Furthermore, with an eye on the coordinating and presiding agricultural development programs and projects of the regional level, the Ministry has created a Regional Unit for Agricultural Planning (URPA) to be stationed at a department's office.

In Quindio, the Agricultural Bureau of the Departmental Government Office is responsible for 1) Agricultural and Livestock Sector, 2) Rural Development and 3) Protection of Environment. In collaboration with URPA, the Bureau has elaborated the "Agricultural Development Plan 1986 - 1990", and is now promoting "Vegetables and fruits production programs". Other responsibility of the Bureau are as given below.

- Marketing structure improvement
- Rural infrastructure
- Investigation and extension
- Farmlands consolidation and development
- Reforestation
- Agro-industry promotion
- Artificial insemination
- Animals' vaccination

B.4.2 C.R.Q.

C.R.Q., a coordinating agency for the present Study, was founded in December, 1964 (two years before the foundation of the Department of Quindio) but started to operate virtually in 1968.

The principal objective of the Corporation is promote economic development of the Department by attending conservation and administration of all kinds of natural resources. Key functions of C.R.Q. are to:

- Promote electric generation
- Regulate water resources for flood control
- Utilize water resources for irrigation
- Recover and improve land capability by means of drainage works
- Exploit groundwater
- Eliminate the deterioration of water quality
- Purify and improve river flow
- Promote to coordinate and, if necessary, to construct hydraulic works and water supply system
- Determine the best use of land resources
- Promote exploitation and exploration of mineral resources
- Promote and implement soil conservation and reforestation

The organization of C.R.Q. comprises two divisions: electric and natural resources; the former is taking charge of rendering electric services to cover the whole of rural sector of the Department as well as urban sector of such municipalities as Buenavista, Calarca (Barcelona district only), Circasia, Cordoba, Filandia, Genova, La Tebaida, Montenegro (partly), Pijao and Salento and the latter is concentrating its function on 1) Planting forestal resources for industrial, land conservation and ornamental purposes, 2) Protection, utilization, transport and commercialization of plants and livestock, and 3) Pollution control, water resources management and promotion of pisciculture.

Currently, besides the present Master Plan Study, C.R.Q. is implementing programs as titled below:

- Integrated rural development (DRI) program;
- Experimental center for the study and reproduction of bamboo (guadua) in Quindio;
- Establishment of countermeasures for the management of soils under cultivation of cassava; and
- National electrification plan for rural area.

C.R.Q.'s budget for implementing programs in the last four years (1983 - 1986) totaled Col.\$532,936 thousand, of which 96.8% has been subsidized by the central government. Yearly distribution of the budget by sector is shown in Table B.4.3. As the table indicates, an annual budget has tripled in the period; investment in natural resources and reforestation together has increased to around 6 times, while that in energy sector has increased by only 30%.

In compliance with the Government's policy for decentralization, C.R.Q. is to withdraw from electric development within two years.

B.4.3 Fedecafe and Coffee Committee

Fedecafe--National Federation of Coffee Growers was incorporated in 1927 for the purpose of protecting coffee growers' interests. Fedecafe's responsibility covers, among others, the following:

1) Protection of domestic market:

In order to guarantee coffee growers with stable income, Fedecafe purchases parchment coffee grains directly from growers at fixed price.

2) Intensification of Production Activities:

In order to intensify crop production practice, Fedecafe gives necessary technical assistance to growers.

3) Enhancement of Living Standard:

Fedecafe renders social services such as a provision of water supply, sewer and electric systems, and education and medical care.

The afore-mentioned Fedecafe's services are materialized through Coffee Committees that are incorporated in each department of the country with a share of coffee production higher than 1% of the national production.

As stated repeatedly, coffee production is a mainstay of Quindian economy, so the Coffee Committee plays a very important role in Quindio. The Coffee Committee of Quindio has, under executive directorate, four divisions and one service unit as follows:

- Engineering Division: to provide and improve rural infrastructure (Road, water supply facilities, schools, etc.)
- Health Division: to promote health and take care of medical services for rural inhabitants
- Administration Division: to compile information and conduct accounting inputs supply service
- Technical Division: to administrate crop production and implement diversification program

- Extension Service: to render direct technical assistance and socio-economic improvement services to coffee growers through municipal coffee committees and preside "leaf rust" control and other enlightenment campaign.

It is worth while to indicate that under the "Diversification Program" being carried out nationwide by Fedecafe, the concern of the Coffee Committee is now expanded to crops other than coffee and to livestock and in evidence of the same, "Five-year Diversification Plan 1984 - 1989" which contains five fundamental and supplemental projects is presently implemented in the Department (Details are as per B.2.2).

Of the twelve municipalities within Quindio, nine municipalities, except Armenia (administered by the Departmental Coffee Committee), Salento and Buenavista, have municipal committee of coffee growers. In these committees, extensionists are stationed to render supporting services in farm level, and inputs and other materials required for coffee production are sold at reasonable prices.

As to access to the credit service, in general, Coffee Committee gives information and instruction to beneficiaries so that they could be facilitated to be loaned by public credit financing institutions. Besides this normal procedure, Coffee Committee offers a special credit line to small farmers to apply for renovation and stumping of plants, maintenance of farms, improvement of living quarters and purchase of sprinklers; conditions for this credit line vary according to farm size, purpose of loan, etc., but interest rate is fixed at 0% - 18% per annum.

B.4.4 Agricultural Credit

Credit for crop cultivation, preparation of lands, acquisition of machinery, livestock and other agriculture-related activities is available in Colombia mainly through Agricultural Financial Fund (FFAP), Caja Agraria and public banks (Banco de Cafetero, Banco de Ganadero, etc.). As shown in Table B.4.1, these three groups share more than 90% of the total amount of agricultural credit provided by public institutions during 1982 - 1986.

Caja Agraria plays very important role for the development of the agricultural sector with its 880 local offices, 409 warehouses of inputs supply, but its contribution to agricultural credit services has dropped in recent years as FFAP has expanded its service coverage.

FFAP was incorporated in 1973 under the decree 5th (Ley 5a) and since then it has risen in importance year by year. Making use of credit channel of FFAP, loans to farmers are made through intermediate banks including Caja Agraria. FFAP finances intermediate banks with interest rates established every six months, and intermediate banks with additional proper funds grant credit to farmers subject to higher interest rates. FFAP shares about 70% of the total loan amount. In 1987, the average interest

rate from FFAP to banks has been 19.5% and from banks to beneficiaries, 23%. The loan conditions vary by crop, by financial capacities of farmers and by other factors; for example, loan for planting paddy rice to farmers with asset more than Col.\$3,000,000 is granted with conditions listed below:

Maximum amount: Col.\$106,000/ha
Period: 6 months
Interest rate: 23%/year

Interest rates for 1987 have risen by 1.5% from the previous year for short and medium terms and by 2.5% for long term. And, the budget of FFAP reached Col.\$133,500 million for the same year with annual growth rate of 17.5% in terms of current price.

According to Table B.4.2, 51.3% of the total approved amount for the agricultural credit was directed toward short term crops, of which four commercial crops (rice, cotton, sorghum and soybean) accounted for 85%. Another major portion of FFAP's credit was distributed to livestock activity with a share of 23.9%.

At present, problems pertaining to the agricultural credit are as given below.

- 1) The loan conditions through FFAP are so stringent that farmers have declined to make use of it; in 1986, 13% of the budget prepared for FFAP remained unutilized.
- 2) The margin distributed for the intermediate banks is so small and profit expected by these banks is held at a lower level. As a result, banks are not willing to engage in the relevant service.

In relation to credit services in Quindio, no up-to-date information is available, but Table B.4.3 presents the tendency in the year of 1984. The total amount of credit reached Col.\$746,133 million, of which Col.\$587,660 million (78,8%) was financed through FFAP and Co\$142,503 million (19,1%) was through individual resource of Caja Agraria; 71.6% of the credit was directed toward crop production activity, 26.5% toward livestock, and the rest to other purposes. Coffee occupied about half the amount covered for crop production.

B.4.5 Agrarian Reform

In Colombia, at an earlier stage, agrarian reform programs had been carried out by Caja Agraria up to 1961 when INCORA was founded under the Decree 135 with two principal objectives: 1) to maintain an equilibrium among rural population by means of redressing imbalanced land tenure between "latifundista" and "minifundista" and 2) to elevate land productivity by means of an appropriate land use. Actually, the following programs are conducted under the responsibility of INCORA.

(1) Land Acquisition

INCORA acquires lands for landless rural people who desire to work in farmlands through following procedures:

- Purchase or substitution
- Expropriation
- Extinction of land ownership
- Donation or cession by land owners

(2) Adjudgement of Lands

All potential lands for crop production acquired by INCORA will be adjudged to landless rural people subject to their being prequalified to comply with the requirements established by INCORA. The adjudgement is to be realized through the two main canals explained below:

- In case of lands being acquired by purchase or substitution, INCORA adjudges them with a same price as they are acquired. Beneficiaries are required to make a payment for lands within 15 years.
- In case of lands being acquired without any payment to INCORA, they are adjudged to beneficiaries free of charge.

(3) Colonization

INCORA promotes to exploit undeveloped lands and to put them into productive farmlands through rural settlement projects. In these projects, INCORA offers supporting services such as provision of transport and social infrastructure, agricultural credit and tilling and preparation of lands for productive purpose. Rural land settlement projects are currently implemented in Arauca, Caqueta, Meta, Magdalena Medio, Cauca and Choco.

(4) Credit and Technical Assistance

INCORA takes charge of rendering credit and technical assistance services to beneficiaries under land settlement projects and other small farmers who are in lack of them.

(5) Encouragement of Farmers' Association

INCORA is also responsible to encourage farmers to form an association or cooperative that aims at ameliorating living standard of rural population.

As of June 1986, INCORA acquired a total of 893,013 ha of land divided into 4,534 projects; of these lands, 475,188 ha (4,039 projects) was purchased, 65,988 ha (253 projects) was expropriated, and 351,843 ha (242 projects) was ceded.

Within the context of the National Development Plan 1987 - 1990, it is scheduled to acquire 470,000 ha of lands in the relevant four years, of which 448,079 ha will be acquired by means of direct purchase of INCORA. The budget prepared for the project has been calculated to be Col.\$22,404 thousand, equivalent to Col.\$50,000/ha and a total of 25,890 families are expected to be benefitted by the project.

In Quindio, because the greater portion of arable lands has been already cultivated for coffee production and other agricultural purpose including livestock, the services by INCORA have been focused on rendering credit and technical assistance to small farmers engaging in animal husbandry.

INCORA's local office in Armenia, established as recent as in November, 1985, covers 12 municipalities of Quindio and 4 other ones of Tolima and Valle del Cauca Departments. Officers working in this office are: one zone manager, three extensionists and one secretary. In 1986, the number of beneficiaries who received credit service from INCORA was 103 in total; 26 of them were settlers under the agrarian reform project and the remainder was small farmers. The total amount loaned to these farmers was Col.\$13,935,000 and 84% of the same was distributed to raising cattle and other livestock-related activities.

It is considered to be infeasible to implement land settlement projects in Quindio in the near future owing to the following two major reasons:

- In the National Development Plan 1987 - 1990, a priority to realize land acquisition and land settlement projects is given to such regions as have been featured by a major social conflict.
- A greater majority of arable lands has been developed and there remains very little margin for further expansion of agricultural land. Moreover, according to the survey conducted by the Study Team, arable lands in Quindio cost as expensive as Col.\$1,000,000/ha on the average - 20 times higher than national budget for land acquisition.

B.4.6 Education and Training of Farmers

SENA, an organization belonging to the Ministry of Labor and Insurance, is responsible for the vocational education and training of workers offering various courses. With regard to the agricultural sector, education and training course consists of: crop husbandry, forestry, livestock, agricultural machinery, rural mechanics, rural management, cropping technology and so on; each course contains 20 - 80 programs that refer to practical agriculture-related technology as well as cultural education. The Department of Quindio is affiliated with the zone III among four zones of the country, and other departments included in the said zone III are Antioquia, Caldas, Choco and Risaralda. In 1983, a total of 27,600 rural people attended SENA's course in the zone III.

Apart from the Zone III, SENA has local office in Armenia to which an Agriculture and Livestock Center is attached. This Center has been operating for 27 years with two key functions as given below.

- 1) To train and educate technical administrators who will work to manage farming activities.
- 2) To bring up leaders to preside farmers' cooperative.

The duration for terminating the Center's training and education is set forth as four years--three at the Center and one on farms.

The technical assistance including an extension service is rendered under the responsibility of independent organizations such as Coffee Committee, INCORA, ICA, Fondo-DRI, but no integrated program has been prepared yet.

B.4.7 Rural Development Programs

(1) Integrated Rural Development (DRI)

The DRI Program in the country has been developed with an eye on overcoming socio-economic problems confronted by rural population and low productivity of crop and animal husbandries. The DRI Program aims at not only promoting and developing agricultural production and related supporting services but also providing and improving rural infrastructure such as road, water supply and sewerage system, education and public health facilities and the like. The Program is implemented in various departments of the country under the general coordination of the Ministry of Agriculture and with foreign loans financed by the World Bank and Inter-American Development Bank.

In 1987, with an objective to reform Fondo-DRI into one of the instruments attending and supporting under-developing rural areas, the Government legislated it into a public institution.

The DRI program in Quindio was started in July, 1986. For the preparation and implementation of the Program, C.R.Q. has been acting as a coordinating institution, while Coffee Committee and ICA advise and supervise on technical aspects and SENA on education and training for rural population. The proposed benefitted areas of the Program have been identified as marginal zones for coffee production located in Cordoba, Filandia, Genova, Pijao and Salento. Up to date two projects have been elaborated as presented in B.2.2 of the present Annex.

(2) National Rehabilitation Plan (PNR)

The Plan covers such regions as are not attended by the DRI Program despite deficiency in adequate institutional, social and political assistance services for development. As the case of the DRI Program, the PNR aims to incorporate new productive areas into land settlement projects. For attaining the objective of the Plan, relevant institutions participate in acquisition and preparation of farmlands, provision of financial and technical services, consolidating marketing system of agro-products and improvement of rural living environment.

Actually, there is no identified project for the Plan in Quindio.

B.4.8 Farmers' Association

One of the most serious problems confronted by Colombian farmers is how to sell their products efficiently. In order to ease this constraint, the formation of an association represented by a cooperative has been encouraged by the interested public institutions.

Because no up-to-date information is available, reference is made to 1983's statistics which indicates that there existed 321 cooperatives of farmers with the following classification:

Products	No. of Cooperatives	National Production (ton)	Vol. Produced by Coop. (ton)	Participation of Coop. (%)
Coffee	57	824,300	559,459	67.9
Banana	3	816,820	781,200	95.6
Dairy products	19	2,691,000	240,790	9.0
Grains	107	3,565,794	96,451	2.7
Cotton	11	130,400	21,845	16.7
Fruits and Vege.	71	7,839,271	9,276	0.1
Others	53	-	-	-

According to the above table, cooperatives are more intensively organized for export-oriented products such as coffee, banana and cotton while for products addressed to domestic market, cooperatives' participation in the national production remains very low. The extremely low level in the organization of cooperatives among farmers engaging in the production of fruits and vegetables is correlated with the following factors.

- 1) Infrastructure such as storage warehouse, processing and packing factories is not provided.
- 2) Information on price and marketing of products is very scarce.
- 3) There is no regional concentration of crop growers engaging in the production of the same product.
- 4) Education and campaign to encourage farmers to form a cooperative are not rendered in an appropriate form.

The number of cooperatives which have been formed by farmers in Quindio is five in total: four by coffee growers and the rest by producers of vegetables and fruits. The coffee growers' cooperatives are located in Armenia, Calarca, Montenegro and Quimbaya and the number of members participated therein including those in other municipalities other than the referred four was 6,392 as of December, 1985. This information intimates that approximately 80% of coffee growers in Quindio is associated with cooperatives. The essential purpose of forming cooperatives among coffee growers is to facilitate the commercialization of their products.

On the other hand, the cooperative of vegetables and fruits growers has been organized just in February 1987. The members participating in the cooperative, 23 in number, are distributed over such municipalities as Calarca, Genova, Pijao and Salento. the cooperative was formed under the initiative and assistance of the Departmental Bureau of Agriculture which is promoting the production of vegetables and fruits in marginal areas for coffee production. Under the contract with the Department Office, members of the cooperative are benefitted by subsidiary policy of the Department Office which bears a half of production cost required in labor recruitment and purchase of inputs.

TABLE B.4.1 DISTRIBUTION OF AGRICULTURAL CREDIT
BY PUBLIC ORGANIZATION

Years	Caja Agraria	FFAP	Banks	Livestock Fund	INCORA	FEDECAFE	Total
1970	44.2	8.2	34.8	7.0	3.7	2.1	100.0
1971	44.5	7.6	35.1	8.2	2.7	2.0	100.0
1972	46.4	7.8	31.6	9.2	3.0	2.1	100.0
1973	48.3	8.6	26.4	10.2	3.9	2.7	100.0
1974	39.4	20.5	24.7	9.4	3.3	2.8	100.0
1975	37.2	27.1	21.3	8.9	2.6	2.8	100.0
1976	35.5	32.0	19.0	8.8	1.7	3.0	100.0
1977	34.3	35.5	17.4	7.9	1.9	2.9	100.0
1978	32.6	38.0	16.8	8.1	1.6	2.8	100.0
1979	34.1	39.3	14.7	6.8	1.6	3.5	100.0
1980	33.9	41.2	14.4	5.8	1.5	3.1	100.0
1981	36.2	36.0	16.9	5.9	1.7	3.2	100.0
1982	27.6	46.3	17.5	4.4	1.9	2.4	100.0
1983	26.8	50.8	14.8	3.7	1.9	2.0	100.0
1984	19.3	58.0	14.1	3.4	3.3	1.0	100.0
1985	23.6	52.9	15.1	2.9	3.7	1.8	100.0
1986	17.2	58.3	17.2	2.6	1.6	3.1	100.0

Source: Revista de Banco de la República, etc.

Note: First six months

TABLE B.4.2 CREDIT OF FFAP BY ACTIVITY

Unit: In million of Col.\$

Activities	1984 Amount	1985		1986	
		Amount	Var. %	Amount	Var. %
Short-term Crops	31,513.2	40,272.6	27.8	50,929	26.5
Other Semiannual Crops	1,223.9	1,707.7	39.5	423.2	-75.2
Seeding and Maintenance	6,581.4	7,837.5	19.1	9,363.3	19.5
Land Preparations and Infrastructure	4,500.0	5,654.2	25.6	6,866.2	21.4
Agricultural Machinery	2,433.5	2,412.9	-0.8	3,652.7	51.4
Livestock	19,365.7	18,582.3	-4.0	23,664.5	27.3
Purchase of Farmland	1,283.9	2,129.9	65.9	1,883.4	-11.6
Others				2,424.1	
Total	66,901.6	78,597.1	17.5	99,206.4	26.2

TABLE B.4.3 CRQ'S BUDGET FOR INVESTMENT 1983 - 1986

Unit: In thousand of Col.\$

	1983	1984	1985	1986	Total	%
Energy	29,270 (1,063)	69,218 (18)	71,700 (0)	41,500 (4,500)	211,688 (5,581)	39.7
Natural Resources (Water)	1,528 (28)	7,024 (24)	12,200 (0)	11,000 (0)	31,752 (52)	6.0
Natural Resources (Reforestation)	27,152 (3,849)	26,141 (2,141)	41,300 (0)	136,000 (0)	230,593 (5,990)	43.3
Welfare, Sanitation and Others	8,772 (0)	10,000 (0)	18,567 (715)	21,564 (4,564)	58,903 (5,279)	11.0
Total	66,722 (4,940)	112,383 (2,183)	143,767 (715)	210,064 (9,064)	532,936 (16,902)	100

Note: Figures in parenthesis represent CRQ's proper budget