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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

EL SALVADOR

PROJECT PAPER

COFFEE TECHNOLOGY TRANSFER

AID/LAC/P-739

PROJECT NUMBER: 519-0362

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete)

Amendment Number

DOCUMENT CODE: 3

COUNTRY/ENTITY: El Salvador

3. PROJECT NUMBER: 519-0362

4. BUREAU/OFFICE: LAC

5. PROJECT TITLE (maximum 40 characters): Coffee Technology Transfer

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 03 DD 31 YY 97

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 92 B. Quarter 3 C. Final FY 97

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 92 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	119	640	759	10,386	1,614	12,000
(Grant)	(119)	(640)	(759)	(10,386)	(1,614)	(12,000)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country						
Other Donor(s)						
TOTALS	119	640	759	10,386	1,614	12,000

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ARDN						12,000		12,000	
(2)									
(3)									
(4)									
TOTALS						12,000		12,000	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters).

To improve per unit yields and overall industry productivity of coffee producers, with a special emphasis on small producers.

14. SCHEDULED EVALUATIONS

Interim MM 06 YY 94 MM YY Final MM 01 YY 97

15. SOURCE/ORIGIN OF GOODS AND SERVICES

[X] 000 [ ] 941 [ ] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

Methods of Implementation and Financing approved:

Douglas W. Arnold
Mission Controller

17. APPROVED BY

Signature: John Sanbrailo

Title: John A. Sanbrailo
Mission Director
USAID/El Salvador

Date Signed: MM 04 DD 11 YY 92

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

PROJECT AUTHORIZATION

Name of Country : El Salvador

Name of Project : Coffee Technology Transfer

Number of Project : 519-0362

1. Pursuant to Sections 103 and 103A of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Coffee Technology Transfer Project involving a Cooperative Agreement to the Salvadoran Coffee Research Foundation ("Grantee") in planned obligations not to exceed Twelve Million United States Dollars ($12,000,000) in grant funds ("Grant") over approximately a sixty-month period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of the Project is five years from the date of initial obligation.

2. The Coffee Technology Transfer Project ("the Project") consists of assistance to the Salvadoran Coffee Research Foundation (PROCAFE), a private, non-profit foundation, to carry out its activities in coffee research, technology transfer, and economic studies in support of increased and improved coffee production in El Salvador.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to such terms and conditions as A.I.D. may deem appropriate.

4. Except as A.I.D. otherwise agrees in writing, the authorized source for procurement of goods and services to be financed under this project is Geographic Code 000, (the United States).

John Sanbrailo
John Sanbrailo
Mission Director
USAID/El Salvador

7/15/92
Date

drafted:PRJ:MScott

Clearances:

ANR:MWise _____ date 3/5/92

PRJ:RWherry _____ date 3/4

ANR:KEllis _____ date 5 March 92

PRJ:MDeal _____ date 3/12/92

DPP:TMcKee _____ date 3/9/92

ECON:RPeterson _____ date 3/6/92

CO:LMcGhee _____ date 3/13/92

CONT:DArnold _____ date 3/9/92

RLA:ISmyer _____ date 3/9/92

DDIR:JLovaas _____ date 4/3/92

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LIST OF ACRONYMS

ABECAFE	Salvadoran Association of Coffee Processors and Exporters
ACS	Coffee Growers Association of El Salvador
BCR	Central Reserve Bank
BFA	Agricultural Development Bank
CACM	Central American Common Market
CSC	Salvadoran Coffee Council
DRC	Domestic Resource Cost
ECC	European Coffee Conference
EIRR	Economic internal rate of return
ENA	National Agricultural School
FIRR	Financial internal rate of return
FUSADES	Salvadoran Foundation for Economic and Social Development
GNP	Gross National Product
GOES	Government of El Salvador
ICO	International Coffee Organization
IBRD	International Bank for Reconstruction and Development
INCAFE	National Coffee Institute
ISIC	Salvadoran Institute for Coffee Research
PACD	Project Assistance Completion Date
PROCAFE	Salvadoran Coffee Promotion Foundation
UCAFES	Union of Coffee Producing Cooperatives of El Salvador
UCRAPROBEX	Union of Agrarian Reform Cooperatives, Producers, Processors, and Exporters
USAID	United States Agency for International Development

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Coffee Technology Transfer Project
519-0362

I. RECOMMENDATION AND SUMMARY

A. Recommendation

The Project Design Committee recommends the authorization of a $12.0 million grant to a private non-profit foundation, the Salvadoran Coffee Promotion Foundation (PROCAFE), to assist the development and transfer of new coffee technologies to approximately one-half of all Salvadoran coffee producers. Of this $12 million, approximately $10.4 million for technical assistance, training, commodities and evaluations will be directly contracted by AID. The Project, to be carried out over a five year period under a Cooperative Agreement, will cost $23.25 million, of which $11.25 million will be funded by PROCAFE from the revenues generated by a "check-off" fee of one dollar per quintal which will be collected on coffee exports and passed to PROCAFE.

B. Project Summary

El Salvador was once a world leader in the development and application of coffee production technologies. This was reflected in the high productivity and premium quality of its coffee in world markets and profitability in the sector. The coffee industry deteriorated during the 1980's as a consequence of civil strife and ill-advised policies, including nationalization of coffee marketing. When the Government of El Salvador (GOES) nationalized coffee marketing in 1981, it virtually destroyed the Salvadoran Coffee Research Institute (ISIC), the GOES coffee research agency which was largely responsible for the industry's preeminence. Twice closed by the GOES, underfunded, highly politicized, and its plant deteriorated, ISIC lost the bulk of its key personnel and its former competence.

The GOES administration which assumed office in 1989 is attempting to reverse coffee's decline. It privatized coffee marketing in 1990 and established a policy framework under which the industry could resume its role as a major sustainable producer of jobs, foreign exchange and government revenues. Despite a now favorable policy environment, improving market outlook, and access to reasonable levels of credit, the coffee industry will not be able to compete in international markets unless it develops and applies new coffee technologies and attains the degree of productivity and profitability required for sustainable market performance.

In 1991, the GOES transferred responsibility for development and dissemination of new coffee technology from government to the coffee industry. To this end, the GOES abolished ISIC and permitted its assets to be used by a private foundation, PROCAFE, which was established by the coffee industry to carry out a program of technology development and transfer to coffee producers. This Project will support the program of PROCAFE.

The goal to which the Project contributes is to revitalize the coffee industry of El Salvador. Attaining the goal implies an increase in employment, income of coffee producers, foreign exchange earnings, government revenues and generation of investment funds for development of other sectors of the economy. The purpose of the Project is to improve per unit yields and overall industry productivity of coffee producers, with a special emphasis on small producers. At the end of this five-year, $12 million Grant, PROCAFE will be providing assistance on 120,000 manzanas (one manzana equals 1.7 acres) of coffee plantations, including plantations operated by 15,000 small farmers. PROCAFE will have brought about an average yield of 20 quintales (one quintal equals 100 lbs.) per manzana -up from an average of nine quintales in 1991- by means of environmentally benign technology packages.

The Project will consist of four components: technology acquisition and development, technology transfer, economic studies, and administration. While both research and extension services will be available to all Salvadoran producers regardless of size, affiliation or location, the Project will finance a special focus on small producers. The Project will enable PROCAFE to address this relatively more difficult-to-reach clientele through a directed extension program, with the assumption that larger producers will be quite proactive in obtaining extension services without PROCAFE having to make a special effort to get the improved technology to them.

In order to extend the technology as economically as possible, the Project will work through organized groups of producers to the maximum extent possible. The economic studies component will monitor both industry-wide data and the microeconomic effects of PROCAFE's technical packages in order to detect national trends and test all recommendations against the criterion of profitability. The administration component furnishes technical assistance to the commodity procurement process as well as such activities as general administration and the required annual financial audits to be contracted by PROCAFE.

Coffee Research

The research component furnishes assistance to PROCAFE's program of basic and adaptive research, field trials, and control of plant materials. The Project will finance four long-term experts in agronomic research, together with short-term technicians. These technicians will assist PROCAFE to structure and implement its program of technology acquisition and development. The Project will also finance commodities to furnish the PROCAFE laboratories and experiment facilities. Project funds will be utilized to quickly build an improved institutional framework and to obtain and organize the resources necessary to carry out its research mandate. (No laboratory equipment has been purchased since 1980 and much of that transferred to PROCAFE from ISIC is not fully serviceable or adequate for the work to be done.) PROCAFE's research unit is composed of six technical departments. Five of these departments, Soil Science, Agronomic Management, Integrated Pest Management, Genetic Management and Post Harvest Management will carry out coffee technology research. The sixth, Experiment Stations, oversees the research farms.

Technology Transfer

The technology transfer component encompasses assistance to the extension of improved production technology and production methods, as well as feedback to the researchers on the validity of the extended technology. The rapid dissemination of known technologies is the most immediate requirement for increasing Salvadoran coffee production and productivity. To bring the new production technology to producers, PROCAFE will use its regional offices in Santa Ana, Santa Tecla, and Santiago de Maria (Usulutan) to coordinate a nationwide extension program. In addition to working in the coffee areas which continued in production during the conflict, PROCAFE plans to reach northwards into formerly conflictive areas where the decrease in coffee production was especially great due to the fighting.

PROCAFE's extension program to smaller farmers follows two main lines. One type of extension deals with the two federations of coffee producing cooperatives, UCRAPROBEX and UCAFE; a separate methodology will be used to reach farmers who are not affiliated with the cooperatives. With these unaffiliated farmers, PROCAFE extensionists will sponsor field days and short courses designed to concentrate them in demonstration areas. In addition to technical advice and training, they will receive information and assistance in affiliating themselves with existing groups or in forming new groups through which services can be more efficiently delivered. Identical technology will be offered in each extension methodology. The aim of the extension program is to increase the farmer's production and yields, while simultaneously improving quality and increasing profit per manzana.

The Project will assist PROCAFE to extend improved production technology to small farmers within the coffee industry. During the first three years of the Project, extensionists will receive training in how to reach small farmers and, as more information becomes available through research and direct dealings with small farmers, their specific concerns and needs will be increasingly addressed. Extensionists will be able to provide farmers with recommendations on production and handling of the crop, use of credit and how to access it, and marketing. Field days and other gatherings in production areas are planned in order to promote the use of improved plant varieties, to demonstrate soil erosion control, and to gain feedback from the farmers.

The Project will finance four advisors to assist PROCAFE to serve its coffee producer members, giving special emphasis to smaller farmers who are less able or likely to invest time and travel in order to obtain the improved production technology. They will assist the PROCAFE extension staff in matters of technology validation, credit access, training and communications, management of extension programs, and cooperative/association development. The Project will furnish vehicles for the extension staff; recurrent costs of the extension effort, including vehicle operations, will be drawn from PROCAFE's own budget as counterpart. PROCAFE expects to have sufficient funds from its annual income (derived from a "check-off" fee on coffee exports) to replace vehicles and other capital assets as they depreciate.

Economic Studies

The economic studies component will provide assistance to the Economic Studies Unit of PROCAFE in carrying out economic studies required to evaluate the structure, production practices, costs, returns and investment requirements of the coffee industry. A special focus of this assistance will be on monitoring and analyzing the costs and benefits of technological change and adoption on productivity and profitability of innovations, practices, and research introduced and promoted by the Project and providing much of data necessary for informed policy making.

The Project will fund a long-term economic advisor to the Economic Studies Unit as well as short-term assistance to carry out special economic and statistical studies and conduct seminars, workshops, and training courses.

Administrative and Management Support

The Director General of PROCAFE will provide overall direction to the Project and will be assisted by a Project-funded Chief of Party, a senior advisor with experience in both research and extension activities. This individual will be the contractor's principal point of contact for USAID and will manage the technical assistance team. As appropriate, the Chief of Party will also advise senior PROCAFE managers for extension, agronomic research, and economic studies.

This component also will finance a US commodities procurement specialist (or a sub-contracted PSA) to assist PROCAFE in acquiring the commodities required for the research and extension activities as well as short-term assistance in selected areas of administration and management. The Project will also partially fund the first year's operating expenses of PROCAFE (up to eight months), until the increased "check-off" fee accumulates sufficiently to assume full funding.

II. BACKGROUND AND RATIONALE

A. Country Setting

El Salvador, the smallest, most densely populated and most meagerly endowed of the Central American countries, was in the sixties and seventies the most dynamic. Although characterized by high illiteracy, infant mortality rates and nutritional deficiencies, its work force was generally considered as the most energetic and dependable in the region. Its entrepreneurs were aggressive and able. Responding first to the opportunities of the Central American Common Market (CACM) and then to other markets, they developed a thriving industrial sector whose role in the economy rivaled that of the long-dominant agricultural sector.

Gross National Product (GNP) growth was impressive, annually averaging 5.4% during the seventies. The country was, however, politically unstable, marked by a highly skewed distribution of income and by political polarization. The civil strife which began in 1980 officially ended only in early January, 1992. It contributed to a reversal of economic growth, brought about a deterioration in the nation's infrastructure, led to massive population movements, produced an exodus of foreign investment and eroded industrial and agricultural capacity.

From 1962 to 1979, coffee, sugar and cotton production sustained an impressive expansion of El Salvador's agriculture sector. Agricultural production (in 1962 colones) rose at an average annual growth rate of 3.8%. The expansionary trend was reversed as a result of the political coups of 1979 and the insurgency which began in 1980. Continued violence was accompanied by other external and internal developments which together contributed to a decline in agricultural production. A drop in international commodity prices in the early 1980s led to the abandonment of 70,000 hectares of cotton land and major curtailment of sugar production.

While the war against the Marxist-led insurgency (FMLN) was being pursued, democratic elections held in 1984 placed power in the hands of the Christian Democratic Party. In an attempt to redress social grievances, the GOES instituted a form of public paternalism through statist intervention in the country's social and economic structures. Banks were nationalized and their credit decisions were made to respond to political imperatives. Some of the large agricultural estates were distributed to campesinos; much of the land was later organized into collective farms.

The GOES nationalized coffee marketing and enacted a series of policy measures that reduced incentives for new planting and for adequate maintenance of existing plantations. During the 1980s, the rate of annual coffee replacement dropped from 17 million to 4 million trees, and 21,000 hectares (about 10% of the crop) were removed from production. Inefficient government delivery of services and credit exacerbated production problems.

Per capita income in the sector decreased substantially in real terms and the high incidence of unemployment led to even lower standards of living for the rural poor. It has been variously estimated by AID consultants that no more than 25% of the total estimated rural work force of 550,000 is fully employed. Many of the most qualified and entrepreneurial members of the agricultural community are burdened with debt and, in view of the uncertainties engendered by past events, have been unable or unwilling to make investment. The decline in the profitability of coffee especially damaged the livelihoods of the 29,000 small independent coffee farmers who were caught up in the nationalization of coffee export marketing. These families depended more than most coffee growers on the reliable provision of technology from the Salvadoran Coffee Research Institute (ISIC), since they were unable to obtain production information from any other source. (In the latter years of ISIC, even this source of technology was virtually unavailable to them due to diminishing budget levels in ISIC. This resulted in the institution spending ninty-five percent of its resources on salaries, leaving almost nothing for expenses to keep extension agents in the field.)

In 1989, the ARENA Party, proclaiming a free market philosophy and calling for dismantling statist institutions, was voted into office. The new GOES inherited an inflation rate of approximately 26%, a trade deficit of $664 million, a current account deficit of $184 million, and external debt of $2.1 billion. The GOES embarked on a program of monetary and fiscal stabilization. It allowed the colon to float, reduced import taxes, moved interest rates closer to market levels, and carefully controlled the credit supply. It started a process of privatization with INCAFE, the national coffee monopsony; adjusted grain pricing and curtailed administratively controlled market interventions; and, most recently, privatized ISIC.

The GOES recognized that of the three traditional agricultural exports --coffee, sugar and cotton-- only coffee had potential for growth while maintaining a stable and competitive long term position in international markets. Two agriculture production priorities were identified by the GOES. The first, restructuring the agricultural sector through export-oriented crop diversification, is intended to establish a less vulnerable agricultural base. The second, revival of the coffee industry, is intended to exploit a known competitive advantage and to restore the coffee industry as a motor of growth.

Table 1. El Salvador. Coffee Exports and Tax Revenues

	1986	1987	1988	1989	1990
		($ million)			
Coffee Exports	546	351	358	229	259
Total Exports	754	570	609	497	580
% of Total Exports	72	62	59	46	48
		(₡ million)			
Coffee Tax	955[1]	431	368	124	254
Total tax revenues	2,702	2,517	2,540	2,457	3,302
% of total revenues	35	17	16	5	8

[1]Includes ₡ 464 million in special tax surcharge levied in that year.

B. The Coffee Industry

1. Economics and Coffee

Coffee production has been El Salvador's most stable and rewarding economic activity and promises to continue to be through the 1990s. The influence of coffee on the Salvadoran economy over the five years ending in 1990 is summarized in Table I. Even during the height of civil unrest and GOES counterproductive economic policies, it was a predominant contributor to employment, exports and government revenue. However, the impact of declining production in recent years is evident.

Coffee contributes 8% of value added to GNP, but this figure understates coffee's social and economic importance. It is a labor intensive industry which gives employment (full or part time) to nearly 300,000 persons. On average, each hectare (one hectare equals 2.47 acres) of coffee production generates 205 person/days of employment: 85 in cultivation, 95 in harvesting, and 25 in transport and processing. Even Producers with five or fewer hectares of coffee and those producers belonging to agrarian reform cooperatives are considered to be small coffee farmers. Producers with five to twenty hectares are considered to be medium sized coffee farmers.

Table 2. El Salvador. Structure of Coffee Production

Size of Holding (Hectares)	# of Coffee Producers	% of Total Coffee Producers	# of Has. of Coffee Area	% of Total Coffee Area
0 - 2	20,937	59.9	15,637	7.8
2 - 5	6,059	17.3	13,829	6.9
5 - 20	4,424	12.6	22,044	11.0
20 - 100	3,033	8.7	91,601	45.9
100+[1]	527	1.5	56,870	28.4
TOTAL	34,980[2]	100.0	199,981	100.0

1/ Includes 107 agrarian reform cooperatives which operate as single farm units.

2/ If individual members of the reform cooperatives are counted separately, the estimated number of coffee producers in El Salvador is approximately 49,000, nearly 41,000 of whom would be classified as small farmers.

With the reduced production which characterized the late 1980s, the industry annually generated between 35 million and 40 million person/days of employment, or the equivalent of between 140,000 to 160,000 full time jobs. Given the high consumption propensities of the rural labor force and smallholders, their coffee-derived earnings contribute to the generation of additional employment almost equal to that generated by the coffee industry itself, i.e. coffee's employment multiplier approaches unity.

No rigorous analysis has been conducted to determine the net annual profits generated by the coffee industry nor the uses to which such profits are put. There is, however, adequate anecdotal evidence that profits derived from coffee fueled development of the burgeoning industrial sector in the 1970s. Increases in coffee prices and the planned increases in productivity should increase profitability and annual surpluses. These surpluses can be used in the short-run to finance renovation of the sector. In the long-run, they can be expected to provide capital for growth in other agricultural and industrial sectors.

Direct tax revenues of the GOES over the period 1986-1990 totalled ₡13,518 million (for a weighted average during the period of $1.7 billion), of which 16% was provided by the coffee industry in the form of an export tax. The combined direct and indirect tax rate on coffee in 1986 was calculated by the World Bank at over 65 percent. The industry was unable to sustain itself while bearing such a burden. The GOES has since reduced the levy to a 35% rate on revenues in excess of $45.00 per quintal. As production increases, and if its earnings were taxed in a more economically acceptable form (such as an income tax), coffee export revenues can continue to be a prime and expanding source of revenue.

2. Profile of Coffee Producer Organizations

The exact size of the coffee industry is unclear. No agricultural census has been conducted since 1971, when 147,000 hectares were reported planted in coffee. Official estimates by the Ministry of Agriculture's Office of Agricultural Sector Planning in 1990 indicate 168,000 hectares planted in coffee. A 1989 USAID survey of agriculture estimates that almost 200,000 hectares are planted in coffee, but concedes that much of this area has been abandoned or is not actively managed. Industry sources doubt that 200,000 hectares of coffee exist in El Salvador but, since more complete data are based on the 200,000 figure, it will be used throughout this document for planning purposes. It should be regarded, therefore, as an upper limit. Resolving the differences between the estimates by means of a census of coffee growers will be one of the Project's initial activities.

Coffee is cultivated by approximately 49,000 producers (15% of El Salvador's estimated 317,000 farmers). Almost 27,000 producers are independent smallholders who cultivate fewer than five hectares of coffee each. In addition, some 14,000 members of 107 agrarian reform cooperatives collectively cultivate slightly more than 21,000 hectares of coffee. Over 80% of coffee producers are smallholders or agrarian reform beneficiaries participating in larger holdings. Together they cultivate more than 25% of the coffee land in El Salvador (See Table 2).

The independent small producers, due to the size of their holdings and current low productivity, rarely sustain their families solely from income derived from coffee sales. They combine coffee production with other crops and are intermittently employed as off-farm labor. Most of the agrarian reform beneficiaries who participate in collective production fare better. Assistance to these cooperatives, funded by the USAID in the 1980s, has brought coffee production on some agrarian reform cooperatives to levels above the national average.

The 4,424 producers with holdings from 5 to 20 hectares cultivate some 22,000 hectares or 11.0% of the total coffee lands. This group includes resident owners who derive their entire income from coffee production and urbanites who utilize their lands for income enhancement. About 46% of all coffee lands are in holdings of 20 to 100 hectares. These provide a major source of income for their owners and, even when their owners have other business interests, the plantations are normally run with professional diligence and sophistication.

There are 420 non-agrarian reform properties with a total of 100 or more hectares which total about 36,000 hectares, or 18% of total coffee holdings. These are frequently part of a vertically integrated production and sales process which links an exporter-owned plantation to a processing plant. The processing plant also serves as a collection and purchasing point for coffee produced by other growers. Table 2 combines the agrarian reform cooperatives with the largest private producers, since the management of the two kinds of coffee plantation are approximately the same.

There are 80 to 100 processing plants, "beneficios", scattered through El Salvador. Some are abandoned and although many are antiquated, their collective capacity is adequate to process the present and near term projected production of Salvadoran coffee.

The Salvadoran Coffee Research Institute (ISIC)

Created in 1955 as an autonomous agency of the GOES, ISIC was, until its abolition in 1981, responsible for generating coffee technology and its transfer to Salvadoran Coffee growers. It was re-instituted by decree in December 1983, without its extension mandate and under control of the Ministry of Agriculture. The GOES again abolished ISIC in October 1991 in order to privatize its functions. Ninety-five percent of its annual budget, (₡6.0 million in 1991) was used for salaries.

Salvadoran Coffee Promotion Foundation (PROCAFE)

This nonprofit organization was founded in 1991 by coffee producers (more than half of whom had holdings of fewer than five hectares and more than 20% of whom were women) to receive the assets of the privatized ISIC and to take over the responsibility for coffee research and technology transfer.

PROCAFE is governed by a board of directors representing ABECAFE, ACS, UCRAPROBEX, and UCAFES, thus representing all affiliated coffee growers through one or more organizations. The board administers research and extension funded by a "check-off" fee collected by the Salvadoran Coffee Council on coffee exports. Because PROCAFE's revenues are based on export levels, large producers pay a proportionately greater share of PROCAFE's expenses.

PROCAFE's statutes narrowly define the activities it will carry out in fulfilling its functions and specify that special programs will be established to service the needs of the small and medium size planters. Additional information on PROCAFE, including its organization chart and position descriptions, is found in Annex E. The Institutional Analysis, page 40, discusses PROCAFE's capacity to implement the Project. PROCAFE's statutes are shown in Annex E.

The GOES formed a Commission in August 1991 to transfer ISIC's assets to PROCAFE. USAID is providing PROCAFE with pre-project assistance to advance its competence in financial management and establish financial procedures which are acceptable to AID. Pre-project assistance is effecting a smooth and efficient transfer of responsibility from ISIC to PROCAFE and preparing PROCAFE for effective and rapid participation in the Project. USAID pre-Project funding of $200,000 has enabled PROCAFE to employ a small number of key administrative and technical personnel to write action plans, establish personnel standards, determine commodity needs, and develop operating procedures within PROCAFE.

PROCAFE now manages a network of nine experimental farms and plots, together with a plant genetic bank which is the largest in Central America. The farms and trial plantations are deteriorated but usable; unfortunately, laboratory equipment and extension vehicles cannot support a nationwide effo (Note: 66 vehicles were transferred by ISIC to PROCAFE in mid . . . Of those vehicles, 30 were not running and were beyond repair. Of the 36 vehicles which were functioning, 26 are of 1970's vintage and 10 of early 1980's vintage, virtually all of them in a marginal state after years of service on poor rural roads.) While renovating the assets passed from ISIC, PROCAFE has begun to assemble the available production technology in order to begin serving producers at the beginning of the agricultural

cycle in January 1992. This program is being undertaken in cooperation with other privately managed extension services and sources of technology available to PROCAFE through its board of directors. PROCAFE's staff of 166 persons (a 35% reduction from the original ISIC payroll) is temporarily supported by the Extraordinary Budget under the privatization activity.

PROCAFE now represents El Salvador in the regional PROMECAFE technology network, and has established links to FHIA in Honduras and to CATIE in Costa Rica.

The Salvadoran Coffee Council (CSC)

The CSC was formed in November 1989 to take over policy analysis and administrative services which had formerly been exercised by INCAFE, the marketing parastatal which was simultaneously abolished. Governed by directors from both the public and private sectors, the existence of the CSC institution signals GOES recognition of commonalty of purpose between government and the coffee industry. The CSC is administered by a general manager who presides over three operational departments (exportation, economic studies and quality control, a department of administration and a legal department) and funds its operations from a $0.40 per quintal "check-off" fee on coffee exports.

The CSC is responsible for the registration and control of domestic and international coffee marketing. It represents the GOES before international coffee organizations and during quota discussions. In addition, the CSC is responsible for recommending policies which have an impact on the performance of the domestic coffee industry (i.e. tax policies, credit policies, etc.) to GOES authorities. The CSC is funded by a registration fee of $0.40 per quintal of coffee exported. Legislation is now in the National Assembly which, when passed, will charge the CSC with collecting an additional $1.00 per quintal exported check-off and passing it to PROCAFE for coffee research and extension services.

The economics section of the CSC maintains and publishes data related to Salvadoran coffee prices, qualities, production levels, costs and exports. While some trends are presented, the level of analysis is relatively superficial. The economics section of PROCAFE will be expected to work with the CSC economist, share data and deepen the analysis conducted on it. The agency appears to have recruited well qualified staff. It publishes a quarterly bulletin which presents and interprets domestic and foreign developments which may affect the coffee industry.

Salvadoran Coffee Growers Association (ACS)

The Salvadoran Coffee Growers Association, sometimes called the "Cafetalera", was founded in 1929 to represent the interests of all coffee growers. It has one authorized regulatory function, the registration of coffee brands, but has functioned as a lobbying group traditionally for larger farmers. ACS is organized regionally and in its General Assembly represents each coffee growing department. The number of representatives from each department is determined by a formula linked to production levels. It has a current membership of 5,000 and charges no dues. The ACS has a 31 manzana coffee plantation, El Carmen, which was donated to it during the 1930's. The proceeds from El Carmen's production and from

financial investments accumulated over the years has made the ACS self-sufficient.

Although the ACS has traditionally focussed the bulk of its efforts on larger producers, it is positioned to assist 25,000 small farmers, potential Project beneficiaries who are not affiliated with either of the two cooperative federations. This year, for instance, the ACS is sponsoring a nationwide campaign against la broca by raising producer awareness through publicity campaigns, putting on seminars and distributing pamphlets on control measures. In the past, the 19 regional offices of the ACS served as focal points for technology transfer and information exchange, as well as support centers for ISIC technicians in the field.

The Union of Production, Processing, and Exporting Agrarian Reform Cooperatives (UCRAPROBEX)

UCRAPROBEX was founded in 1988 as a non-profit service entity for the purpose of strengthening the production capacities of the coffee producing agrarian reform cooperatives. Representatives of the 50 cooperatives (having a collective membership of 6,659 members) make up its general assembly which elects a seven member Board of Directors. The Board selects a general manager who is responsible for all operations. In 1991, 50 of El Salvador's 108 coffee producing cooperatives were members of UCRAPROBEX and received extension assistance under arrangements made with ISIC. Of the 50 cooperatives which are members of UCRAPROBEX, 46 are reform cooperatives.

The agrarian reform cooperatives function as single production units, rather than as U.S.-style cooperatively owned farms. Four non-reform cooperatives are also served under the arrangement. The members of these non-reform cooperative control their own land, but market cooperatively through UCRAPROBEX. As such, these persons can be clearly shown as individual beneficiaries.

UCRAPROBEX was increasingly successful in administering ISIC-provided technical assistance and in securing excellent production response from the cooperatives and their members. Their personnel now have sufficient experience with extension to enable them to expand the system with the expectation of further success.

The Salvadoran Union of Coffee Producing Cooperatives (UCAFES)

UCAFES was founded by eleven coffee producing cooperatives under the commercial code of El Salvador in 1979 as a non-profit organization. Since then, twelve more cooperatives have joined, bringing a total of approximately 5,500 planters under its institutional umbrella. It is governed by a Board of Directors elected by a General Assembly made up of representatives of each cooperative. It derives income from an annual membership charge. UCAFES purchases agricultural inputs for its members, assists them in complying which legal or regulatory requirements and provides them with coffee market information.

Since 1986, UCAFES operated an extension service for its members with agronomists who have established demonstration plots as instructional points and who advise and assist the technicians of individual cooperative's in dissemination of new technology and improved agronomic practices. UCAFES is now serving 7,000 potential Project beneficiaries, 3,000 of whom are considered small farmers, with the remainder being medium-sized farmers.

Association of Coffee Processors and Exporters (ABECAFE)

ABECAFE is a non-profit entity which represents 38 coffee processors, many of whom are also larger producers. The Board of Directors consists of seven members elected from the General Assembly of the association. ABECAFE is supported by a monthly membership quota which is charged to all members. Its principal activities are to serve as a voice for El Salvador's coffee exporters, promote quality and acceptance of Salvadoran coffee throughout the world, and facilitate communication between processors, buyers and sellers.

3. Coffee Production and Marketing

Prior to 1980, El Salvador was the leading coffee producing nation in Central America and a world leader in coffee technology. By 1988, production in absolute terms had dropped in value to $350.3 million from its 1979 level of $675.2 million and its share in Central America coffee exports fell from 31% to 17%. Over the same period, production per manzana declined from about twenty-five quintals to slightly more than eleven.

After 1979, the competent support system operated by ISIC, which had contributed to the technological superiority of Salvadoran producers, deteriorated for lack of budget support. Mistaken GOES economic policies discouraged producers from renovating the trees on their plantations. In general, producers reduced their maintenance expenditures and postponed replanting. Some marginal producers simply treated coffee as a wild crop. As pointed out in a September 1989 study by the Salvadoran Foundation for Economic and Social Development (FUSADES), Salvadoran banks calculate that properly managed coffee production requires annual expenditures of about ₡6,500 per hectare. The study noted that even on actively cultivated coffee farms, producer outlays in 1988 averaged about ₡4,350 per hectare and in some cases were as low as ₡1,800.

During the 1980s, many farmers came to the conclusion that improved technology could not overcome the combination of a poor policy environment and civil strife. Without the stability needed to allow labor intensive technologies to pay off, coffee production fell, especially among smaller farmers. During 1991, the policy constraints were lifted, and in early 1992 a Peace Accord was signed between the GOES and the FMLN ending the almost 12 year war. The means of testing and delivering better ways of producing coffee, however, have deteriorated. Now economic incentives exist for smaller farmers to make the investment of time and money in coffee production technology. Access to that technology is the principal remaining constraint to profitable small farmer coffee production.

A survey conducted for the USAID in 1988 revealed the extent to which reduced expenditures reflected inadequate cultural practices. Only 20% of the older plantings had been replaced by newer, more productive

"paca" variety. Neglect of sound cultural practices was especially pronounced among small and medium size producers (small producers having coffee holdings of 0-5 hectares and from 5-20 hectares for medium sized farmers). Only 25% of these carried out some annual replanting, less than 40% fertilized at all, and only 4% fertilized at recommended rates and intervals. Some 35% did not prune shade trees and 15% did not control weeds. Of their plantings, 75% were infected by coffee rust and 60% by "broca" beetles (borers), but only 40% of the planters took measures to combat rust and 20% to combat the beetles. It was also noted that about 60% of the plantings consist of trees that have aged beyond their most productive years. Replanting, necessary to restore previous yields, can now be done with improved genetic materials which promise much higher productivity than was formerly possible.

ISIC, the GOES autonomous agency charged with coffee research and technology transfer, developed most of the innovations in coffee production initiated in El Salvador during the 1960s and 1970s. Other coffee producing nations exploited these improvements and achieved impressive increases in yields while El Salvador's yields steadily declined. Among the new technologies was the development of superior genetic materials and adaptation of agronomic practices to exploit the full potential of the materials. The new plant materials, selected on the basis of high production potential, disease resistance, ease of harvesting and genetic stability, lend themselves to high density planting and consequent high productivity per area planted. Older varieties of coffee trees are normally planted at about 2,000 trees per manzana, but as many as 5,000 of the new varieties may be planted in the same area. They have the additional advantage of stable annual production, although they require special cultivation regimes which vary according to climatic and soil conditions. The net revenue to farmers from the modern technology must be carefully calculated due to higher production costs.

Coffee Export Market Outlook

The 1989 breakdown of the International Coffee Organization (ICO) quota arrangements led to a decline in prices. The average base price for Salvadoran Milds declined in mid-1991 to $0.82 per pound from $1.42 in the first quarter of 1990, but the medium to long run price prospects are better. An estimated average increase in world demand of about 1.4% per year over the next decade, in concert with an average annual world production increase of about 1.3%, is expected to maintain slight upward pressure on prices. The World Bank has forecast two sets of price changes through the year 2000; one under an assumed resumption of the quota arrangement and one in the absence of an agreement. In both cases, prices are projected to rise to about $128 per quintal by year 1995 and fluctuate around that level thereafter. It should be noted that these are base prices. High quality coffee of the kind produced in the mountains of Ahuachapán frequently commands a premium of as much as $9.00 per quintal above base prices.

The World Bank forecasts in terms of volume of demand are modest compared to those presented by Neuman Gruppe A.C. at the 1988 European Coffee Conference. That firm, the largest importer and processor in the world, expects large increases in per capita consumption in the European countries and some growth of consumption in traditionally non-coffee drinking countries, e.g. Japan and China, and total US consumption is

expected to rise slightly. Overall, the firm forecasts that total world demand will rise from a current level of 69 million bags to 96 million bags by the end of the century. Although such optimistic projections cannot serve as a basis for planning, they indicate that the World Bank's projection is modest.

El Salvador's share in the growing market will depend on its degree of competitiveness. Its competitive potential is excellent, but the negative impact of the present export tax on producer incomes and current low yields can, if not redressed, prevent realization of its full potential. The absence of a coffee quota may prove serendipitous for El Salvador. Its reduced exports over the last five years made it appear likely that its ICO quota would have been reduced to a level commensurate with its actual export performance, thus limiting its ability to export at the cartel price.

III. PROGRAM FACTORS

A. Host Country Policy and Strategy

Since 1989, agricultural exports have benefitted from an exchange rate regime which placed production for export on an equal competitive footing with other investments. Import tariffs on fertilizers and machinery have been reduced. Credit has been freed from administrative controls and has become more widely available in rural areas. At the sector level, the GOES has moved strongly to restore market pricing to basic grains and to promote other incentives to private trade.

The GOES has included support to the coffee industry in its broad program of returning ownership and control of the economy to private hands. As noted, it returned export marketing of coffee to the private sector in 1989. As a result of this decision, the union of agrarian reform cooperatives, UCRAPROBEX, is now the second largest exporter of Salvadoran coffee. Following the creation of a Privatization Commission in March 1991 to oversee the divestiture of state-owned assets, the Legislative Assembly voted in June 1991 to rescind government control of ISIC. The vote depended in part on the assurance of the industry that the resulting research entity would be representative of the individual coffee growers rather than of the economic power of any small group.

B. Relation to the CDSS

The Project conforms to the 1990-1994 CDSS goal of promoting long term growth through increased agricultural production, increased exports, and a strengthened private sector. The acquisition and diffusion of improved coffee production technology will increase yields and, therefore, the amount of coffee offered for export. Due to the structure of coffee exports in El Salvador, small farmers participate in the export market on equal commercial terms as do larger producers. To strengthen the private sector, the GOES is passing to the coffee industry the responsibility for financing and directing the measures by which the industry's productivity will be maintained. This is consistent with the privatization objectives of the GOES Five Year Plan.

Small farmer coffee production in the eastern and northern mountains suffered during the conflict, since rebel strongholds were in these coffee producing areas. Marketing was disrupted; production inputs such as sacks and fertilizers were unavailable. In the reconstruction of El Salvador after the ceasefire, the extension of coffee production methods will help increase rural incomes in these areas where few other income sources exist.

C. Relation to Other A.I.D. Programs

Since 1989, USAID has assisted the GOES to reform its macroeconomic and sectoral policies in order to permit exports to compete with investments for imports and for consumption. This assistance was principally in policy studies. USAID projects have infused $135 million of credit funds through the Central Reserve Bank for agriculture since 1980; these funds continue to circulate. The agreements with the Central Reserve Bank which control these lines have helped avoid the serious collection problems which plague other credit lines by applying rigorous loan approval criteria and by not making new loans to borrowers who are in arrears in their repayment of earlier loans. Furthermore, these credit lines require higher co-financing by the borrower and are more closely controlled for late payments. USAID has also funded studies and technical assistance to the GOES and the private sector in the preparation of the agricultural, industrial, and financial sectors for the privatization of various GOES-owned or operated enterprises.

D. Other Donor Programs in Agriculture

The GOES is negotiating an agricultural sector loan jointly with the World Bank and the Interamerican Development Bank. Funds from the loan will be used to reorganize the Ministry of Agriculture in order to improve its efficiency. The loan will assist the Ministry in the privatization of the autonomous institutes which control sugar and grain marketing, in improving research and extension in basic grains, in plant and animal quarantine procedures, and in the improvement of irrigation management. The loan is expected to become active during Fiscal Year 1992.

IV. PROBLEM STATEMENT, CONSTRAINTS ANALYSIS, AND PROJECT STRATEGY

A. Problem Statement

The problems which this project addresses are the low levels of coffee production and how to acquire and transfer coffee production technology to farmers through a sustainable nongovernmental coffee research foundation. Since 1989, the GOES has reformed the policy framework within which coffee exports are made. Despite a now favorable policy environment, stable market outlook, and access to reasonable levels of credit, the coffee industry will not be able to compete in international markets unless it develops and applies new coffee technologies and attains the degree of productivity and profitability required for sustainable market performance.

Revival of coffee production requires that Salvadoran producers adopt the fourth factor: modern, profitable production techniques. However, PROCAFE is only beginning to adapt and develop coffee production technology; and there is currently no well defined mechanism for transferring such technology, especially to smaller producers. The GOES believes that these tasks should be financed and managed by the direct beneficiaries of the technology.

B. Constraints Analysis

1. Policy

Policy constraints to a nongovernmental research agency in El Salvador are few. The increasingly favorable economic policy environment has been further improved by the general GOES support to private enterprise. Present policies encourage investment in technology development, but not at the expense of El Salvador's most abundant asset, labor. GOES willingness to transfer responsibility for coffee research and technology dissemination to a private foundation is an example of its policy of withdrawing from activities which can be successfully undertaken by private entities.

2. Finance

Financial constraints to the success of a private research foundation are related to the security of the foundation's income in order to defray recurrent costs and to the availability of credit which may be required by farmers in order to implement the improved technology as it becomes available.

A potentially debilitating constraint to a research foundation is the uncertain availability of income to finance recurrent costs. For coffee, funds have come from the public treasury, but have been subject to political whim and limited annual tax revenues. To ensure that all producers contribute to the research process in accordance with their means, the GOES and the Salvadoran Coffee Council will have to take action to increase the "check-off" fee (from $0.40 to $1.40 per quintal) which the Council collects on coffee exports. The increase in the fee, $1.00 per quintal ($0.01 per pound), will be passed to PROCAFE as its core funding. The collection mechanism avoids problems in canvassing the industry for funds and obviates the free-rider problem which often plagues privately funded institutions which have public responsibilities. Further discussion of this constraint is found on page 27 on recurrent costs.

Production and investment credit will be necessary to support the adaptation of technological advances which the research foundation will be extending. Production credit will be required to support the use of improved agronomic practices. The banking system has extensive experience in coffee production lending and the Central Reserve Bank (BCR) has provided adequate resources for the purpose. Investment credit will be required for lands undergoing total or partial replanting. In early 1992, investment credit through various commercial and agricultural banks appears adequate to meet the demand which the Project-financed technological recommendations might generate. Further discussion of credit sources and access appears in Annex G.

For a priority target among the clientele which A.I.D. desires to assist, that is, smaller farmers, formal term credit has been available but difficult to obtain. As the commercial banks are privatized, they tend to become more conservative in their lending. As smaller producers are less likely to be served by the commercial banks, the programs admininstered by the GOES-operated Agriculural Development Bank have become more important as a source of small farmer credit. Commercial agricultural loans require high collateral; transaction costs to the lender are higher than in large

industrial or commercial loans. Effective systems exist to deliver formal credit to medium and large coffee growers. Historically, most smallholders have relied on informal production credit extended by processors or suppliers. Many processors provide cash advances to farmers as a means of ensuring delivery of coffee at harvest; funds come from the futures contract deliveries against which the processors themselves must deliver. Bank credits to suppliers of agricultural inputs are often passed on to small farmers in the form of deferred payment for delivered supplies. For members of cooperatives, the cooperative often incurs formal bank debt and then relends to the individual farmer. The debt is guaranteed by the farmer's future delivery of coffee to the cooperative.

To deal with the special credit needs and problems of the small coffee producers, the Project will fund the services of a long-term small farmer credit advisor. This credit specialist will (a) work with both formal and informal credit providers to identify and/or develop appropriate credit delivery mechanisms for project beneficiaries; (b) acquaint project extension agents with available credit sources and mechanisms so that they can communicate the information to project participants and assist them in assessing credit; and (c) conduct special credit workshops for small coffee farmers.

In addition, a project-funded Cooperative Development Advisor will encourage and assist in getting unaffiliated small coffee producers into existing cooperatives or helping to build upon existing associations or more informal groupings of small producers, thus facilitating access to credit.

3. Institutional Capacity

The principal institutional constraints to the acquisition and extension of technology through a nongovernmental foundation are linked to the ability of the recently formed private foundation (PROCAFE) to manage and administer its role in the industry and to its ability to equitably respond to the variety of producers who support PROCAFE.

A constraint to the long term success of PROCAFE will be the ability to clearly link the "check-off" fee paid upon export to the benefits derived by the producers due to improved coffee technology. PROCAFE is anticipated to have an annual operating budget in excess of $3 million, an amount which at this time is estimated to be adequate to meet PROCAFE's needs during the foreseeable future, but which will require considerable visible benefit to the consumers of PROCAFE's research. PROCAFE must therefore have strong management of its technical and administrative operations in order to justify the funding. This comparison of budget to results, characteristic of private sector management, is a relatively untried procedure in Salvadoran agriculture. The lag between definition of research needs and the achievements of results poses a risk to continued support for the initial level of the registration fee dedicated to research.

A second potential constraint placed on the institution also has a social dimension, discussed below, as PROCAFE accommodates the technology needs of a broad spectrum of producers. A concern of some is that larger producers, due to their relatively larger contribution to PROCAFE's budget through the registration fee, may lead them to exercise relatively more control over PROCAFE. However, PROCAFE's articles of incorporation require it to serve all producers and its board of directors is drawn from large and

small producers. Thus PROCAFE will be required by its Board to balance its services and their delivery. Furthermore, PROCAFE's research will be neutral with regard to scale in that the benefits will be available and accessible to large, medium and small farmers alike. Finally, much of the project funding and activities are directed specifically to small producers, most notably in the areas of extension, credit access and cooperative/association development.

4. Sociological Constraints

Adaptation of improved coffee technology appears free of important social constraints. However, the natural divisions in society will affect the initial functioning of the research foundation. The social and economic conditions of the small planter impose constraints to participation: illiteracy, risk aversion, and distrust of bureaucracy. Better educated and bigger producers will not want to wait for the smaller ones to catch up technologically. The resultant tension, if not handled carefully by PROCAFE's directors, could cause PROCAFE to divide against itself and fail.

C. Project Strategy

The missing factor in the revival of the Salvadoran coffee industry is technology. The Project will support the newly created nongovernmental foundation, PROCAFE, as it takes over the assets of ISIC and begins to deliver the needed technological processes. The Project will assist PROCAFE to make a strong start in its research program through the provision of commodities and expert scientific advice. The Project will also assist PROCAFE to develop extension arrangements which reach small farmers. Project success will be measured in the effects of PROCAFE's efforts on yields, on farmer incomes from coffee, and on the quality of the coffee produced.

V. DETAILED PROJECT DESCRIPTION

A. Project Goal and Purpose

The Goal to which the Project contributes is to revitalize the coffee industry of El Salvador. Attaining the goal implies an increase in employment, foreign exchange earnings, government revenues and generation of investment funds for development of other sectors of the economy. The Purpose of the Project is to improve per unit yields and overall industry productivity for coffee producers with an emphasis on small producers.

B. End of Project Status

At the end of this five-year, $12 million Grant, PROCAFE will be providing assistance on coffee holdings operated by 15,000 small farmers and 46 agrarian reform cooperatives. This represents half of the small coffee farmers in El Salvador. (During the latter years of ISIC, virtually no small producers were serviced as its budgetary resources and extension outreach capability limited it to working with those who could pay for services, or who came into ISIC to request services.) For these farmers, PROCAFE will have brought about an average yield of 20 quintals per manzana by means of environmentally benign technology packages. PROCAFE will have established a permanent coffee research and extension capacity.

C. Outputs

Four Project outputs will be achieved in order to bring about the end-of-project status. First, 15,000 small coffee producers and 46 agrarian reform cooperatives will have received technology transfer services. Second, new technologies and improved cultural practices will have been applied to 120,000 manzanas of coffee lands. To attain this level, 20,000 manzanas will be fully replanted, 31,250 manzanas will be partially replanted, and 68,750 manzanas will be cultivated under improved agronomic practices offered by PROCAFE. Third, matured plantings will yield 25 quintals per manzana for fully replanted coffee, 20 quintals per manzana for partially replanted coffee, and 15 quintals per manzana for coffee under improved practices. (The current national yield is nine quintals per manzana.) Fourth, PROCAFE will have sustainable administrative, research and technology transfer units, with 68 trained technology transfer agents employed by PROCAFE and assigned to three coffee producer associations or to regional offices.

D. Project Components

The Project will consist of four components: research, extension, economic studies, and administration. The research component will assist PROCAFE's program of basic and adaptive research, field trials, and control of plant materials. The extension component will assist the promotion of improved production technology and production methods to small farmers, as well as obtaining feedback to the researchers on the validity of the extended technology. In order to extend the technology as broadly and as economically as possible, the Project will work through organized groups of producers (e.g. cooperatives, grupos de amistad y trabajo, producer associations, etc.) to the maximum extent possible.

The economic studies component will monitor both industry-wide data and the microeconomic effects of PROCAFE's technical packages. The administration component furnishes technical assistance to PROCAFE's economic studies division. It also includes logistical support to the contract technical assistance team as well as AID-managed activities such as Project evaluations and the PROCAFE-contracted annual financial audits.

Component 1. Research

Acquisition and development of new coffee technology calls for a predictable mix of scientific skills and resources within a suitable institutional framework. In relation to the size farm which applies the new technology, the research effort itself is neutral with regard to scale. Coffee planting, cultivation, and harvesting cannot be mechanized, and thus the technology package for both large and small farms is similar. However, research must be specific to the conditions of each geographic producing area.

The Research Division consists of six technical departments and two staff offices under the supervision of a research director. Five of these departments, Soil Science, Agronomic Management, Integrated Pest Management, Genetic Management and Post Harvest Management carry out coffee technology research. The sixth, Experimental Stations, oversees the operations of PROCAFE's research sites. The staff offices are environmental management and statistics.

The Project will finance four long-term experts in coffee research, together with short-term technicians, to assist PROCAFE to structure and implement its program of technology acquisition and development. The Project will also finance eight vehicles for the research staff and commodities to furnish the PROCAFE laboratories and experiment facilities. PROCAFE's Research Directorate operates from the physical facilities and with the equipment which were formerly ISIC's. Project funds will be utilized to improve the institutional framework and to obtain and organize the staff and equipment necessary to carry out its research mandate. More specifically, PROCAFE will implement systems of institutional management which have heretofore never existed in Salvadoran research (or extension) entities. These systems include strategic planning of the research agenda with specific activities aimed at solving problems which constrain production and have been identified by producers and verified by extensionists. Furthermore, PROCAFE will develop a personnel system which insures that employees are selected and retained on the basis of merit. Personnel management will include an escalafón that lays out a career track for employees and provides financial and educational incentives for those who wish to progress along it. Vehicle control and "pooling" systems (perennial problems in Salvadoran institutions), will be established to insure that vehicle usage is directed at legitimate research and extension activities. Computerized systems of communication, commodity control, financial management, data storage and analysis, and evaluation likewise will be implemented.

The Project will provide PROCAFE with long-term advisors for the agronomic, genetic, pest, and post harvest management units. Planned levels of effort are shown in Table 4, page 30, which is part of the source selection information section of this paper. The advisors, working as a team, will give the research department competence and stability during its critical start-up period. Short-term advisors will be provided as specific problems are encountered or as special expertise is required to advance particular research objectives. It is anticipated that short-term technical assistance will be provided in general environmental management, coffee waste disposal, agroforestry and to carry out special research and in special seminars.

Commodity requirements for refurbishing the laboratories and experimental farms are estimates based on probable need. Although ISIC's equipment has been made available by the GOES to PROCAFE, the appropriateness and condition of the equipment is generally poor. Eight 4-wheel drive vehicles will be required to transport personnel to and from validation plots, nurseries and other coffee planting sites. Expendable supplies are included in PROCAFE's counterpart to the Project as recurrent costs.

The Agronomy Division is responsible for testing the effects of plant populations, fertilizers, harvesting dates, etc. on yield and quality. Assisted by a long-term Agronomy Advisor, it will also develop a calendar of activities for each coffee producing area of El Salvador. The calendar will show periods for pruning, fertilization, pest control, etc. on small farms. This management tool helps farmers apply the agricultural recommendations extended to them by PROCAFE. The Agronomy Division will develop appropriate soils treatment regimes applicable to the different soils of the coffee regions.

The Genetics Advisor will assist the Research Division staff to propagate selected coffee cultivars for local evaluation trials and to make seed available to private nurseries. These nurseries will be the sources of plant materials for farmers who will be improving their production through replanting. PROCAFE will also establish a seed certification program in order to avoid fraud in plant sales and to monitor the quality of the plants distributed. In the longer run, the Directorate will take on more sophisticated tasks such as genetic selection. A properly balanced set of skills and resources must be in place to carry out the planned research activities. The Project makes provision for these by assembling, under a single management unit, an array of skilled personnel to address all anticipated areas of research.

The initial activities of the PROCAFE pest management division have the dual objectives of adapting known technologies to diverse Salvadoran growing conditions and of restoring healthy biological balance to the coffee plantations. The long-term Pest Management Advisor will assist the division staff to control coffee pests while minimizing the effect of chemical production inputs on the environment. Thirteen pathogens and pests infest Salvadoran coffee plantations, but coffee rust fungus and coffee borers (the "broca" beetle) are the most serious immediate threats. Nematode infestation in the soil is a widespread and continuing problem. The infestation is not severe enough to threaten the industry's immediate survival, but continued neglect reduces productivity and profitability.

Agricultural chemicals make up a significant fraction of the cash outlay for small coffee farmers. To the extent that proper use of chemicals can reduce the costs of production, farmer incomes will be increased. Integrated pest management in coffee can avoid excessive chemical use by substituting cultural practices for purchased inputs. Reduction in chemical use and the selection of environmentally benign chemicals should reduce chemical run-off into streams. The Advisor will assist the pest management staff of PROCAFE to adapt or develop environmentally benign remedial measures for treatment of the major diseases and pest infestations and make these known to technology transfer personnel. Equally important, they will develop regionally specific agronomic regimes for prevention of such infestations.

Consistent with A.I.D. environmental policy, an environmental assessment is planned under the Project prior to the extension to farmers of any technical package which promotes the use of agricultural chemicals. (Although the Project is not going to finance or distribute chemicals to project benificiaries, the growers are expected to purchase and apply selected chemicals on their crops to promote and protect the high yields required to pay for the investment. See Annex C, Environmental Considerations). In the Cooperative Agreement with PROCAFE, a covenant will be included stating that PROCAFE will implement the recommendations of the assessment.

Harvested coffee is a perishable product, whose treatment prior to final processing affects its quality. The Post Harvest Advisor will assist the Post Harvest Division to determine where improvements are required in the handling of coffee berries before they arrive at the processing plant, as well as during their processing into green coffee beans. The Advisor will also assist the Division to improve processing procedures for smaller or older mills in order to retain quality of the beans during processing.

Resolution of the coffee waste problem will be a high priority due to the annual dumping of pulp into streams. The solid wastes of coffee processing (the pulp of the berry) can be converted into an excellent source of nutrient rich humus. The Advisor will assist the Division to adapt or develop methods for such conversion. Low cost treatment facilities have been developed elsewhere and some research on waste treatment was carried out by ISIC. Policy recommendations will be made to the GOES for use of waste treatment when appropriate facilities are available.

Due to the complexity of the research program, not only in its planning, but also in its analytical requirements, the Project will finance short term assistance. These experts range from scientific specialists (soil chemists, entemologists, etc.) to persons who can operate and interpret the results of analytical equipment such as spectrometers. The demand for short term assistance and its justification will be coordinated by the technical assistance contractor's chief of party in consultation with PROCAFE's management and with the Mission.

Throughout the improvement of the research program, the Project will fund both short- and long-term technical training. Some short-term training from external sources will be required although most training will be provided by the technical assistance team. Provision has been included for in-country training sessions over the life of project, on topics to be determined once the research team has arrived on site. A part of the training funds can be used for PROCAFE's technical personnel to attend international conferences so that they may keep abreast of technological advances and acquire new sources of information.

Funding for long-term master's degree study in the U.S. is also being provided for up to six PROCAFE research personnel.

Component 2. Technology Transfer

PROCAFE's Technology Transfer Division, made up of four departments, is responsible for making improved technology and research results available to farmers. It is the point of contact between PROCAFE and the producers, with 68 extension agents. The Validation Department takes research results and tests them under actual conditions on the farm for agronomic and economic results. These results are passed on to the Technical Assistance Department for dissemination to coffee farmers nationwide. The Project will finance assistance to design training programs and materials for all coffee farmers; a special emphasis, however, will be placed on the particular needs of the small producers who, for reasons of illiteracy or lack of money or time to travel long distances to attend workshops, etc., need special programs specifically tailored to their needs and circumstances. The Communications Department publicizes PROCAFE and its programs, and provides training aids and extension publications for other divisions. The fourth Department, Plant Certification, ensures the quality and source of plant materials offered for distibution to farmers.

The rapid dissemination of known technologies is the most immediate requirement for increasing Salvadoran coffee production and productivity. To bring the new production technology to producers, PROCAFE will use its regional offices in Santa Ana, Santa Tecla, and Santiago de Maria (Usulutan) to coordinate a nationwide extension program. The regional offices are supported by 23 branch offices which ensure that extension staff remain close to the producers and well integrated into local organizations. In addition to working in the coffee areas which continued in production during the conflict, PROCAFE plans to reach northwards into formerly conflictive areas where coffee production ceased due to the fighting.

PROCAFE's extension program to smaller farmers follows two main lines. One type of extension deals with the two federations of coffee producing cooperatives, UCRAPROBEX and UCAFE; a separate methodology will be used to reach farmers who are not affiliated with the cooperatives. It should be pointed out that the aforementioned federations of coffee producers have been selected as vehicles through which to disseminate technology, not only because of a capability to directly provide technology interventions, but because they (and the other aforementioned associations) afford a mechanism whereby to bring together their members for training in the appropriate interventions. Identical technology will be offered in each extension methodology, but the means of accomplishing the transfer to farmers will be different. The aim of the extension program is not only to increase production, but to increase the farmers' profit per manzana.

For the cooperative federations, PROCAFE can take advantage of economies of scale in delivering its program to the members of the cooperatives. Due to their management style, the 46 reform coops under UCRAPROBEX can be treated as single production units. These cooperatives resemble large, privately owned farms which together cultivate 15,000 manzanas of coffee. Extension presentations and training will be offered to the technical staff and field foremen of these farms. However, members of these cooperatives do not own or control a specific plot of land, so it is not meaningful to count them individually as farmers. The Project therefore considers the cooperative as a whole as a single beneficiary.

The four non-reform cooperatives (595 members) within UCRAPROBEX and the 23 cooperatives (5,500 members) within UCAFES control their own land, and are thus considered individual farmers and beneficiaries. Their coffee holdings total 32,000 manzanas. The PROCAFE extension program will treat them as groups of individual producers. The common link to their production and marketing cooperatives permits PROCAFE to conveniently reach these producers using the established organization of their cooperatives.

Approximately 30,000 small coffee farmers are not associated with cooperatives in the two federations. They live in the same geographic areas as the cooperatives operate in around the country and have much in common with affiliated farmers, but extension programs directed at the cooperatives cannot be expected to reach these nonmember farmers. In order to reach these unaffiliated farmers, PROCAFE will use agricultural extension methods proven in other countries. PROCAFE will use local radio stations, posters, and personal contact to bring these farmers into loose local groups for the purpose of technology transfer. Transfer to these farmers will be a more labor intensive activity for PROCAFE, since it cannot depend on established contacts such as those of the cooperatives.

The Project will assist PROCAFE to extend improved production technology to small farmers within the coffee industry. Training in extension program management will be provided to the extensionists over the first years of the Project, with increasing geographical specialization as information is developed. Extensionists will be able to provide farmers with recommendations on production and handling of the crop, use of credit and how to access it, and marketing. Field days and other mass gatherings in production areas are planned in order to promote the use of improved plant varieties, to demonstrate soil erosion control, and to gain feedback from the farmers.

The Project will finance long-term and short-term technical assistance in extension management. Planned levels of effort are shown in Table 4, page 30, which is part of the source selection information section of this paper. Five long-term persons will assist the PROCAFE extension staff in matters of credit access, management of extension programs, and cooperative programs. The Project will furnish 41 vehicles for the extension agents in order to ensure that mobility does not hamper extension efforts. Recurrent costs of the extension effort, including vehicle operations, will be drawn from PROCAFE's own budget as Project counterpart.

The Project will finance a Microeconomist to work with the Validation Division as it tests the technological packages proposed by researchers. This specialist will assist the PROCAFE staff in data collection and analysis as the Division tracks production costs and income effects of the technology. In agronomic validation, any technical assistance needed would be provided by the appropriate research advisor.

One Project-funded Extension Advisor, will assist PROCAFE to reach the smaller coffee producers who are less apt to invest time and travel in order to obtain the improved production technology. In the first year of that period, the specialist will assist PROCAFE to design and implement an extension program for small farmers. The specialist will be available during the second and third year to guide PROCAFE's staff as they take over the management of the programs.

This program to reach all strata of the coffee industry establishes the public service responsibility of PROCAFE, the justification for its financial support by the industry it serves, and the need to allocate resources on social as well as economic grounds. PROCAFE's founders have set forth the organization's service role within its statutes and identified assistance to the small holders as one of its special obligations. In a covenant under the Cooperative Agreement, USAID will require that the activities of PROCAFE satisfy this condition.

Improvements in coffee production depend in some measure on the access by the farmer to term credit. As discussed in the constraints analysis, page 16, credit is available, but is often difficult for small farmers and cooperatives to access. Many farmers do not understand how to complete forms and to present information in order to qualify for existing credits. A Project-funded Credit Advisor will assist PROCAFE to incorporate information about credit use and access into the extension program. This advisor may also assist cooperatives in accessing credit for sublending to their affiliates. A number of pre-cooperative groups have been identified as coffee extension targets. A project-funded Cooperative Advisor will work with these groups and unaffiliated farmers to assist them to better organize to receive extension services.

A long-term Training and Communications Advisor will be funded by the Project to work with the Training and Communications Departments of the Directorate of Technology Transfer to assist them in developing better training programs and publications.

The Training Department is primarily responsible for coordinating, conducting and/or contracting all training carried on by PROCAFE, including in-house training for PROCAFE personnel and outside training activities sponsored by other units in the organization. In addition, this Department assists other PROCAFE personnel to improve the effectiveness of their training activities. The Communications Department is responsible for the effective design of publications and training aids for other divisions, and it publicizes the PROCAFE organization and its programs. It is anticipated that most of the actual production of publications and training aids will be contracted out, but this department's personnel supervise production and advise other personnel on how to incorporate technical information into attractive and useable formats.

A Library and Resource Center exists within the Technology Transfer Division to maintain appropriate research journals, professional publications and audio-visual equipment and supplies. The Project will fund technical assistance to help establish and operate the library as well as to acquire technical publications.

In addition to 41 vehicles for the PROCAFE extension agents, commodity requirements for the Technology Transfer (extension) Division include six four-wheel drive vehicles, a microbus (a total of 48 vehicles for extension) and an assortment of small agricultural tools. Recurrent costs associated with Project funded technical assistance and commodities will be borne by PROCAFE's counterpart contribution.

Component 3. Policy and Economic Studies

The GOES macroeconomic and sectoral economic policies which created the environment for a revival of the coffee industry should be maintained and further strengthened. PROCAFE's analysis is directed inward at domestic issues, whereas the Salvadoran Coffee Council (CSC) with which PROCAFE cooperates, is an externally oriented body. While the CSC has responsibility for recommending coffee policies to the GOES, PROCAFE's economic studies section will monitor and analyze the costs and benefits of technological change and adoption on productivity and profitability, providing much of the data necessary for informed policy making.

The Economic Studies Unit is located in the Office of the Director General and carries out economic and statistical studies required to evaluate the structure, production practices, costs, returns and investment requirements of the coffee industry. It works closely with the CSC in economic analyses of the coffee industry and provides PROCAFE with guidance on economic issues. Further, the economic unit determines the relative costs of coffee production and assures that technological innovations meet profitability as well as production criteria. The Unit also does coffee credit analysis and studies producers' access to, and use of, credit for coffee production and investment.

Table 3. Coffee Technology Transfer
Consolidated LOP Time Line
for AID-funded Inputs

	FY92	FY93	FY94	FY95	FY96	FY97
Component	34	1234	1234	1234	1234	1234
<u>Research</u>						
Advisor Team	X	XXXX	XXXX	X		
Facilities Rehabilitation		XXXX				
<u>Extension</u>						
Advisor Team		XXXX	XXXX	XXXX		
<u>Policy and Economics</u>						
Economic Advisor		XXXX	XXXX			
<u>Administrative and Management Support</u>						
Advisor to Director General (Chief of Party)	X	XXXX	XXXX	XXXX		
Procurement Services		XXXX				
Evaluation				XX		XX
PROCAFE operating expenses	XX	X				

The Economic Studies Unit is responsible for the economic evaluation of coffee production and of the structure of the coffee industry. The technical assistance furnished by the Project will assist the Unit to establish a statistical base for analysis of the industry. It includes a census of coffee growers, estimation of production costs for various strata of producers, and measures of profitability. The Project will fund a long-term Economic Advisor to the unit as well as short-term assistance during the first four years to carry out special economic and statistical studies and conduct seminars, training courses, etc.

Component 4. Administrative and Management Support

Project funded assistance primarily supports the research and extension activities of PROCAFE, although certain costs of establishing the foundation are included in the AID contribution. The Director General of PROCAFE will provide overall direction to the Project and will be assisted by a Project-funded Chief of Party, a senior technician with experience in both research and extension activities. Planned levels of effort are shown in Table 4, page 30, which is part of the source selection information section of this paper. This person will be funded for an estimated 39 months. As necessary, the Chief of Party will also advise senior PROCAFE managers for extension, economic studies, and agronomic research. The Chief of Party will be the contractor's principal point of contact for USAID and will manage the technical assistance team.

In administrative support, the Project will finance a Commodities Procurement Specialist, or sub-contract a US Procurement Services Agent (PSA), to assist PROCAFE in acquiring the commodities for the research and extension activities. The advisor or PSA will draft specifications for all Project-funded commodities required in the refurbishing of the ISIC facilities, the vehicles and equipment necessary for the research and extension programs, and data processing.* The advisor or PSA also will assist PROCAFE to prepare bid documents, install and observe procurement procedures, and deal with shipping and importation.

Three project-funded vehicles will be provided for the Office of the Director General (which includes the Economic Studies Unit).

* (The estimated number of vehicles to be project-financed totals 70: Research Division-8; Technology Transfer Division-48; Office of the Directorate-3; and Technical Assistance Advisors-11.)

Recurrent Cost Capacity

The Project will be obligated as soon as the Mission is satisfied that the GOES has established a legal and operational system for assessing coffee exports at a rate of $1.00 per quintal exported. A law to do this is currently in the Legislative Assembly. It would authorize the CSC to collect the $1.00 per quintal exported "check-off" and pass it directly to PROCAFE. The "check-off" mechanism would insure PROCAFE annual operating funds of at least $3.0 million at current production levels and, presumably, higher amounts as the coffee industry recovers to its former levels of production (i.e. $4-5 million per year). A delay of as much as eight months is anticipated from the time of approval of the increased fee until funds actually become available to PROCAFE. The Project therefore includes

support for general operating costs of PROCAFE for the first eight months of Project-supported activities. After that time, the Project will revert to standard cost sharing and indirect cost accounting procedures.

E. Implementing Agencies

The Project will be implemented by means of a Cooperative Agreement with the Coffee Promotion Foundation (PROCAFE), a Salvadoran non-profit organization founded in June 1991.

In addition to coordination between producer associations and PROCAFE, it is necessary for PROCAFE to coordinate and cooperate with the CSC, the mixed institution which is directly responsible for formulating and recommending policies which affect the coffee sector. Coordination between the PROCAFE and the CSC is the overall responsibility of PROCAFE's Director and the head of CSC. Mutually supportive economic studies will be planned on an annual basis and routine reporting and data systems will be jointly implemented.

F. Project Management

A U.S. Direct Hire Project Manager from the Mission's Agriculture and Natural Resources Office will manage the Project. In accordance with Mission policy, a Project Implementation Committee will be established under the leadership of the Project Officer, including the Project and Controller's Offices and participation of other support offices such as Contracts, Legal, or Commodity Procurement. Quarterly progress reviews will be held with the Project Implementation Committee. The Project will be included in the semi-annual portfolio review, chaired by the Mission Director. Current Mission staffing is consistent with Project monitoring responsibilities.

The initial success of the PROJECT depends upon the Ministry of Agriculture (MAG) ceding the current ISIC installations to PROCAFE during the start-up period (probably at least three years). An incomodato arrangement between PROCAFE and the MAG will allow PROCAFE to operate the facility, for the public good, at a symbolic cost per year, giving the organization time to locate a suitable property and accumulate the funds necessary to build its own facility.

G. Evaluation Plan

The Project intends to revitalize the coffee industry by developing and transfering modern production technology to El Salvador's coffee farmers. Of particular interest is the Project's impact on small-size farmers who are beneficiaries of project sponsored activities. As such, the Project will be evaluated at two levels: (1) The performance of the sector as a whole and the effectiveness of the Project in revitalizing it; and (2) The impact at the farm level of project activites on small farm operations and the well-being of small farm families.

At the sector level, the relevant variables will be derived from national accounts and agricultural sector data collected by PROCAFE and DGEA. They include such indicator's as the change in national production, area planted, yields, foreign exchange earnings and employment.

Data which indicate the impact of the Project will be collected through the extension management information system. These data include such indicators as the number of farm visits made (disaggregated by gender, size location and affiliation) and the number and type of technological interventions effected. These data will also give an indication of the changes effected by the Project's activities in such variables as farm yields (by size and technology employed), market channels, farm level value added, employment and input purchases. The data can be extrapolated to indicate the Project's impact on rural residents.

To the extent possible, special studies will be conducted by the PROCAFE Economic Studies Unit to yield farm level data on incomes from coffee farming operations, although the difficulty in segregating out income from any one source is recognized.

At the outset of the Project, a census of coffee producers will be conducted which will provide baseline information for comparison to information collected during mid-term and final evaluations, scheduled for October 1994 and July 1997, respectively. Both evaluations and the determination and collection of baseline data will be carried out collaboratively with the Economic Studies Unit. It is also recognized that returns to agricultural research (even in the United States) generally lag 8-10 years and while returns to extension can be measured more rapidly, segregating out the impact of extension activities from other changes which impact the sector (exchange rate changes, for example, and their stimulus or lack thereof on investment) is difficult.

Baseline information will consist of an analysis of the beneficiaries with an emphasis on monitoring small farmers. This effort should be led by the Economic Studies Unit. Content of baseline data will be determined in conjunction with the Economic Studies Unit. Baseline information will be maintained and updated by the Economic Studies Unit. Both interim and final evaluations will include updates of this database.

The mid-term evaluation, planned for the third quarter of FY94, will focus on progress to date and corrective actions needed. It will consist of a review of PROCAFE's ability to support coffee research and extension, the structure of the programs, an enumeration of the beneficiaries of both research and extension and an estimation of the economic effects of project-sponsored technology. Principal areas of emphasis will be the management and goal-setting process for research, the planning and management of budgets, the breadth and coverage of the extension program, the feedback loop from farmers to the researchers and the sustainability of PROCAFE without external assistance. The review of PROCAFE itself can be accomplished by a small team of persons versed in agricultural research and extension. The review is expected to take approximately one month to accomplish and must be supported by the statistical data from the beneficiary group.

The final evalution, to be carried out three months before the PACD in FY97, will make an assessment of the impact of the Project on the coffee industry as a whole but with special sensitivity toward the Project's impact on small farmers. It will also link the achievements of this project to the programatic strategic objectives of the Mission. This final evaluation will require 4-6 weeks using a team including a social scientist as well as agricultural research and extension experts. It will be performed

collaboratively with the Economic Studies unit using data collected during the Project which may be supplemented by additional data obtained by the team through interviews, surveys etc.

SOURCE SELECTION INFORMATION

Table 4. Coffee Technology Transfer
Estimated Contractor Level of Effort
By Component
(Including Evaluation and Audit)

Agronomic Advisor		24 pm
Plant Genetics Advisor		18 pm
Pest Advisor		24 pm
Post Harvest Management Advisor		12 pm
Short Term Advisors		40 pm
subtotal	118 pm	
Microeconomist		24 pm
Extension Specialist		36 pm
Cooperative Advisor		24 pm
Credit Advisor		24 pm
Training and Communication Advisor		12 pm
Short-term Advisors		12 pm
subtotal	132 pm	
Chief of Party		39 pm
Economics Advisor		24 pm
Procurement Services Specialist		12 pm
Short-term Statistician and other Short-term Technical Assistance		21 pm
subtotal	96 pm	
AID Evaluation		6 pm
Audit (AID managed)		10 pm
subtotal	16 pm	
Total		362 pm

SOURCE SELECTION INFORMATION

VI. FINANCIAL PLAN

The $12.0 million A.I.D. Project will be obligated by means of a Cooperative Agreement to be executed with PROCAFE. Of this $12.0 million, AID will directly contract for technical assistance, training, commodities and evaluations totaling $10,386 million. (See Table 9.) An initial obligation of $3.0 million will be made in FY 92. The balance will be obligated in subsequent fiscal years, subject to the availability of funds. Total financing under the Project is $23.25 million. Local currency funding, estimated at $11.25 million will be provided by PROCAFE from the proceeds of the CSC coffee export registration fee. The life of the Project is five years, beginning in FY 1992 and ending in FY 1997. Costs and the estimated A.I.D. annual disbursement schedule are summarized in Table 6. Annex B shows the details of the budget calculation.

TABLE 5. Coffee Technology Transfer Project Financing Analysis by Budget Element ($000, dollar equivalent of colones)

	AID		PROCAFE	Total
	FX	LC	LC	Budget
Technical Assistance	5,862			5,862
Training	862			862
Personnel			3,716	3,716
Commodities	3,426			3,426
Construction		218	846	1,064
PROCAFE Operating Costs		1,312	6,688	8,000
Evaluation	236			236
Audit		84		84
TOTAL	10,386	1,614	11,250	23,250

SOURCE SELECTION INFORMATION

Table 6. Coffee Technology Transfer Project Estimated Expenditures by Fiscal Year ($000)

	Total	FY92	FY93	FY94	FY95	FY96	FY97
Total Project cost	23,250	759	9,030	4,537	3,199	2,856	2,869
A.I.D. contribution	12,000	759	7,039	2,626	1,024	408	144
PROCAFE contribution	11,250	-	1,983	2,002	2,145	2,414	2,706

Approximately $5.7 million or 48% of the A.I.D. funding for the Project will fund externally procured technical assistance, the bulk of which will be provided during the two start-up years. A.I.D.-funded training outlays which total $862,000 refer to training procured from external sources. In-house training funded by PROCAFE is counted as part of its counterpart contribution. A.I.D.-funded commodities and outlays for repair and refurbishment of the ISIC building total $3.6 million or 30% of the A.I.D. grant. The timing and final amount of the $1,312,000 A.I.D. contibution to PROCAFE's operating costs respond to PROCAFE's anticipated income stream, since PROCAFE's revenue in the first year of the Project cannot be calculated until the export registration fee is implemented by the CSC. If it is approved at the proposed rate of $1 per quintal, the levy will produce revenues of approximately $3.0 million annually.

SOURCE SELECTION INFORMATION

TABLE 7. Coffee Technology Transfer.
Estimated Expenditures of AID Contribution by Input ($000)
(adjusted for 4% annual inflation)

FX	FY92	FY93	FY94	FY95	FY96	FY97	Total
Technical Assistance Team	119	2,550	2,148	747	298	-	5,862
Training	-	195	278	260	93	36	862
Commodities	-	3,426	-	-	-	-	3,426
Evaluations/ base line survey	-	71	75	-	-	90	236
Total Dollars	119	6,242	2,501	1,007	391	126	10,386
LC							
Construction	-	109	109	-	-	-	218
Audit	-	16	16	17	17	18	84
Operating Costs	640	672	-	-	-	-	1,312
Total Local Currency Costs	640	797	125	17	17	18	1,614
Total Grant Costs	759	7,039	2,626	1,024	408	144	12,000

SOURCE SELECTION INFORMATION

Table 8. Coffee Technology Transfer Contracts for Technical Assistance (Not including Evaluations or Audits)

Technical Assistance Team (346 pm) Research Advisors, Extension Specialists, Economics, Administration and Purchasing Services Specialist	
Total Technical Assistance	5,862

Table 9. Coffee Technology Transfer Payment Verification Matrix for Methods of Implementation and Financing

Method of Implementation	Method of Financing	Approx. Amount ($000)
1. A.I.D. Direct Contract for:	Direct Payment	$ 10,150
- Technical Assistance		(5,862)
- Commodities Procurement		(3,426)
- Training		(862)
2. A.I.D. Direct Contract for:	Direct Payment	$ 236
- Evaluations		
3. Host Country Contract for:	Reimbursement	$ 302
- Construction		(218)
- Financial Audits		(84)
4. Under Cooperative Agreement w/PROCAFE for:	Reimbursement	$ 1,312
- Operating Expenses		
TOTAL		$ 12,000

SOURCE SELECTION INFORMATION

Table 10. Coffee Technology Transfer Summary List of Commodities ($000)

Office Furniture and Equipment	300
Computers and Communications Equipment	250
Library and Publications	50
Research and laboratory	1,365
Vehicles (70)	1,365
Miscellaneous	96
Total Commodities	3,426

Note: No pesticides will be procured with Project funds.

VII. PROCUREMENT PLAN

Project procurement will be accomplished by a mix of AID direct and host country mechanisms. While the entire $12 million of AID funding will be obligated under a Cooperative Agreement with PROCAFE, the institution will request the USAID to directly contract through free and open competition for the procurement of the technical assistance, training and commodities. The procurement specialist (or subcontracted PSA) will handle the bidding, contracting, and transport of Project commodities. Commodities financed under the Project will have their source and origin in the United States, consistent with AID's Buy America Policy as issued December 5, 1990. No pesticides will be financed with Project funds. Customs clearance will be the responsibility of PROCAFE. The USAID will likewise directly contract for the evaluation services to be provided under the Project. The determination to use a Cooperative Agreement mechanism was made based upon the considered opinion of the USAID that it would need to have substantial involvement in the management of this project which involves a relatively new private organization.

The reconstruction of the former ISIC facilities will be contracted by PROCAFE using approved procedures consistent with host country contracting. PROCAFE also will contract annually for a financial audit which shall be performed in accordance with generally accepted auditing Standards, the U.S. Comptroller General's "Government Auditing Standards" and the AID "Guidelines for Financial Audits Contracted by Foreign Recipients". The period end of each audit will coincide with the recipient's (PROCAFE's) fiscal year end. USAID/El Salvador's CONT/ALO will (1) provide training to PROCAFE on the recipient audit program, (2) provide the scope of work and list of Regional Inspector General (RIG) - approved audit firms for each audit, (3) approve the audit contract prior to signature, (4) review and approve the draft audit report, and (5) attend entrance and exit conferences.

Source and Origin Waivers

The Project will include a blanket waiver for training outside the United States in coffee production and extension procedures and for the

procurement of certain laboratory equipment not manufactured in the United States. The non-U.S. source training is estimated at $250,000 over the life of the Project, with likely sources to be Colombia, Honduras, and Costa Rica. The non-U.S. laboratory equipment is estimated at $300,000 during the Project life, with the likely sources being England, Germany, and Japan.

SOURCE SELECTION INFORMATION

VIII. PROJECT ANALYSIS SUMMARIES

A. Beneficiary Analysis

Benificiaries of the Project will be El Salvador's coffee producers. A principal focus of the project, however, will be 15,000 small farmers and 46 agrarian reform cooperatives which receive technical assistance from PROCAFE through the three coffee producer associations. These persons live primarily in the higher altitudes in rural areas of the departments of Ahuachapán, Sonsonate, La Libertad, Santa Ana, and Usulután. Their average pre-project family cash income is estimated at $600 annually, which places them slightly below the poverty line established by the GOES. The families of these 15,000 small farmers represent 90,000 persons. Members of the 46 agrarian reform cooperatives participating in the Project number approximately 6,000 families representing 36,000 people.

Coffee production and sales involve rural workers (augmented at harvest time by urban dwellers), small planters, large planters, processors and their employees, truckers, warehouse personnel, fertilizer and pesticide distributors and equipment sales firms. The economic and social impacts of the coffee industry are clearly widespread. Farm labor, however, absorbs about 65 percent of production costs, and any expansion or contraction of production impacts proportionately on rural employment and income.

ISIC calculates that over the past decade, coffee production employed labor at the rate of 9.2 person days per quintal of finished product. By the end of the Project, about 15,000 new full time jobs will have been created by the expanding use of technology in coffee production. At 1991 wage rates, this would add about 56 million colons to annual rural incomes. Increased demand may result in upward pressure on wage rates. Wage increases are clearly desirable, but unless fully off-set by commensurate improvements in productivity, wage increases will be reflected in higher production costs. This project, by its contributions to higher productivity, establishes conditions for improvement in the wage structure of rural labor.

Approximately 10,000 small planters and 5,000 planters in cooperatives (including those of the agrarian reform) will receive technology under the project. Their increased average yields will bring concomitant increases in income, standards of living and economic security. Other benefits will be derived from the Project's success. The cooperative movement is likely to grow as small and medium sized planters band together to strengthen their economic power. Many of the now marginally self-sufficient small farms will become stable small businesses. It is expected that the organization of small planters into mutually supportive groups will strengthen their influence within PROCAFE.

Women as Beneficiaries

About 30% of Salvadoran coffee lands are reportedly owned by women. Women make up at least half of the work force employed by the coffee industry. Men do the heavy pruning and other tasks requiring greater physical strength, but women share in all other tasks including weeding, spraying, fertilizing and harvesting. Most observers concede that the superior dexterity of women make them more efficient coffee pickers. It is likely that harvest related income (a substantial portion of annual income) of women will increase.

The various coffee associations and cooperatives have no formal barriers to women's participation at any level. Women are already on the directorates of cooperatives, and one is President of ABECAFE. During the Project, PROCAFE and its affiliated associations will promote equitable labor and organizational practices and will identify and attempt to rectify gender related inequities, e.g. discrimination in women's access to production credit. PROCAFE will make a good faith effort to substantially increase the number of women employed in professional and technical positions.

Reporting on project beneficiaries will be disaggregated, with income and employment impacts reported by gender, farm size and location. Each grower association will report periodically on the incidence of extension visits and once a year on the production and income impacts on recipients.

B. Technical Analysis

1. Technology Acquisition

The rapid dissemination of known technologies is the most immediate requirement for increasing Salvadoran coffee production and productivity. However, neglect of the coffee lands over the past decade has left a legacy of acidified and nutrient poor soils, endemic diseases, pest infestations, and declining productivity and profitability. In addition, untreated coffee wastes are contaminating the nation's waterways.

The short term activities of the PROCAFE research unit will have the dual objectives of adapting known technologies to diverse Salvadoran growing conditions and of restoring healthy biological balance to the coffee plantations. Of some thirteen pathogens and pests known to infest Salvadoran coffee plantations, coffee rust and "Broca" beetle are the most serious immediate threats. Nematode infestations are also widespread and are a continuing problem. The infestations are not currently severe enough to immediately threaten the industry's survival, but continued neglect could render it vulnerable.

Acidification of the soils inhibits the release of nutrients and negatively affects plant growth and yields. Acidification is frequently accompanied by a loss of humus which reduces soil's ability to retain water. During the dry season, trees in acidified soils are stunted and weakened, making them more susceptible to disease.

The research units of PROCAFE will adapt or develop environmentally benign remedial measures for treatment of the major diseases and pest infestations and make these known to technology transfer personnel. Equally

important, they will develop regionally specific agronomic regimes for prevention of such infestations.

Acidification can be quickly reversed by application of appropriate calcium based chemicals, but preventing acidification requires carefully calculated application of fertilizers and the return of vegetative matter to the soil. The research unit will develop appropriate soil treatment regimes applicable throughout the different coffee regions.

The solid wastes of coffee processing can be converted into an excellent source of nutrient rich humus. The unit will adapt and/or develop new methods for such conversion, as well as explore other uses for wastes.

Resolution of the liquid coffee wastes problem will be a high priority. Low cost treatment facilities have been developed elsewhere and some research on waste treatment was carried out by ISIC. Policy recommendation will be made to the GOES for enforced use of waste treatment when appropriate low cost facilities are available.

The adaptation of known coffee cultivation technologies will be carried out primarily through validation trials of selected cultivars. The performance of the cultivars will be tested in different soils, at different elevations and under a variety of cultivation practices. The results will enable the research unit to establish cultivation models applicable to the different growing conditions in the coffee region.

PROCAFE's researchers will propagate selected cultivars, make seeds available to the nurseries and planters and establish a seed certification service. They will undertake the sophisticated tasks of genetic engineering and biological pest control. A properly balanced set of skills and resources must be in place to carry out the planned research activities. The Project provides for these by assembling, under a single management unit, an array of skilled personnel to address all anticipated areas of research.

2. <u>Technology Transfer</u>

Appropriate combinations of one or more of three production improvement models will be recommended by technology transfer agents for use on plantations: (1) Improvement of current agronomic practices, (2) partial renovation and (3) total renovation.

Improvement of current agronomic practices will affect production per manzana in some proportion to planting densities. For example, in the case of a small holder who had planted an old variety of coffee at densities of approximately 2,500 trees per manzana, there would be a rise in production of about three quintals per manzana in the year following the initiation of improved practices. An additional one quintal increase over each of the next two years reasonably could be expected. The improved practices consist primarily of better pruning, elimination of weeds, proper usage of fertilizer and appropriate pest management.

Partial renovation involves replanting some portion of existing farms with new dwarf varieties at greater densities. One example: If existing trees are spaced at seven foot intervals, alternate rows would be removed and replanted with dwarf varieties at three and a one-half foot

intervals. One thousand new trees would replace 500 old trees. In a second renovation a year later, additional old trees would be removed and similarly replaced.

Thus, a manzana previously planted to 2,500 bourbon variety trees might, after partial renovation, have 1,500 old trees and 2,000 of the new varieties. The effects of improved practices on the old trees and the combination of new high yielding stock and improved practices bring about a rise in production per manzana of about three quintals in Year 2, nine in Year 3, 20 in Year 4, and 25 in Year 5. The production increase may be expected to stabilize at a level of 27 quintals per manzana in the sixth year. Partial renovation patterns may vary widely depending on topography, age of trees, etc.

Total renovation or establishment of a new plantation offers still greater yields; off set in part by greater investment requirements. Total renovation calls for planting of 4,000 fast growth dwarf varieties such as Catuai or 5,000 Pacas on each manzana of cleared ground. Average yields of 15 quintals may be reasonably expected in the third year, increasing by about 10 quintals a year through Year 6. Production may be expected to drop off about 10 quintals in Year 7 and stabilize at 30 quintals per year thereafter.

C. Social Soundness

1. Rural Labor and the Small Planter

The Project will have a significantly favorable social impact on rural laborers and small producers who utilize the new technologies. Coffee production is labor intensive, and the planned expansion will produce a substantial increase in employment. Technology based production increases will enhance employment generation. Studies carried out by ISIC in 1984 found that labor requirements increased three-fold when high technology was utilized in coffee cultivation. The study noted that high intensity production required 236 person days of labor per manzana while more traditional, less intensive production practices sometimes required as little as 72 days of labor inputs. The increased demand for labor will undoubtedly put upward pressure on wage rates and increase the income levels of the already employed.

The small farmer, who stands to benefit substantially from assistance under this project may, however, hesitate to take advantage of the opportunities it offers without active outreach programs by PROCAFE which demonstrate the potential benefits of the new technology. Using a traditional mixed cropping pattern of coffee, basic grains, and marketable fruit and vegetables, and selling his labor to other producers, the small planter has established a diversified source of food and income. He has an understandable reluctance to abandon this system, which produces low, though relatively stable income.

The technology packages offered to the small planter must be compatible with his/her present economic framework. For these small planters, PROCAFE's research unit's validation trials must be carried out under mixed cropping conditions. Only technology models consistent with current cropping patterns will be immediately acceptable to small planters.

Approximately 82% of small planters are illiterate, further constraining the transfer of technology. Transfer agents will have to rely heavily on graphic presentations and demonstrations. The methods used successfully with informal social groups, known as "Grupos de Amistad y Trabajo" are especially relevant. Using conveniently established demonstration plots, the transfer agents bring small groups of farmers together for practical training at different stages of the crop cycle. A variation of this procedure will be included in the technology transfer programs of this project.

Two precautionary notes are in order. First, failure to tailor technology transfer to the special needs of the small planter will lead to its rejection. Second, overly ambitious application of the new technologies may place inordinate financial demands on small farmers. In both cases PROCAFE must adapt and focus a significant number of its programs to these realities or attainment of the social and economic objectives of the Project will be reduced.

2. **Effects on Women**

Women, who make up about 50% of the rural work force, will be more fully employed as a result of the Project. By its PACD, approximately 15,000 new jobs will have been created, at least half of which will be filled by women. It is generally acknowledged that women are more efficient harvesters than men. The crops produced by the new dwarf varieties are denser, lower and more easily harvested than the older varieties. Under these circumstances the superior harvesting skills of women should enable them to earn more than their male counterparts.

Reportedly, women own about one-third of the coffee lands in El Salvador. These owners should enjoy substantial entrepreneurial rewards from the increased production engendered by the Project. A special effort will be made to identify the female owners and to provide technology transfer services to at least half of them.

As noted earlier, the Project will attempt to involve women in non-traditional occupations, to eliminate barriers to their participation in professional and leadership positions and to assist them in accessing credit. It should be noted that 42 of the first 200 members of PROCAFE are women, and a woman serves as the Vice President, and chief spokesperson, of the Board of Directors.

D. Institutional Analysis

PROCAFE is a registered nonprofit Salvadoran voluntary organization consisting of the major coffee producer and processor groups. Although created in 1991, PROCAFE has rapidly organized itself in order to take over the operation of the ISIC research farms and facilities as ISIC was privatized by the GOES. The ISIC privatization decree of July 1991 specifically charged PROCAFE with the responsibility for research and extension in the coffee industry. With the demise of ISIC, PROCAFE has assumed the role of El Salvador's representative in the regional technological network, PROMECAFE. It is the first private research body to be admitted.

The land and buildings which belonged to ISIC remain GOES property under the Ministry of Agriculture. They are managed by PROCAFE under a trust agreement, or incomodato. The agreement remains in force at the pleasure of the two parties, raising the possibility in some future GOES, that PROCAFE could be dispossessed of its physical plant. PROCAFE's board of directors includes a broad representation of the political spectrum: provided that PROCAFE itself remains apolitical, there is little reason to anticipate that any of the major parties would void the agreement. All Project-funded commodities are titled to PROCAFE; its staff is a private workforce beyond direct GOES control.

PROCAFE will obtain its operating expenses from a registration fee levied at the time of export and collected by the CSC. This fee is fixed by the CSC as the joint GOES and industry policy body. The same private sector coffee organizations which control PROCAFE sit on the CSC board. Thus, PROCAFE's financial flows depend directly on the productivity of the industry it supports and on the industry representatives within the CSC. At present levels, PROCAFE expects to collect in excess of $2.5 million annually from the registration fee. Of these funds, 75% will be assigned as counterpart for the Project.

Organizationally, PROCAFE has arranged itself to grow into the institutional role which it has chosen. Appropriate financial, administrative, and internal control systems have been implemented, but without a large staff. As income becomes available and the work load extends beyond the initial 160 employees, additional positions can be activated as needed. The agronomic and economic research divisions will start with the existing ISIC experimental sites, but will have to fully renovate the laboratories. The extension staff can begin work immediately from the offices of PROCAFE's five constituent organizations. Management and technical expertise have been employed, with the possibility of expansion should it be necessary. PROCAFE will be able to administer a national extension program during 1992.

E. Financial Analysis

Planters will use the new technologies only if the financial benefits they offer are higher than alternative investment options. Two analyses were conducted to determine the returns which a planter can expect from application of the new technologies: (1) the financial internal rate of return at the farm level (Annex H Tables 13 and 14), and (2) a cash flow analysis (Annex H Tables 15 and 16). These analyses were done for total and partial renovation under highly conservative production assumptions. A sensitivity analysis was run under differing assumptions of expected prices, yield increases, areas planted and tax schemes which encompass all reasonable expectations.

1. Financial Internal Rate of Return (FIRR)

The financial internal rate of return was determined by comparing net financial income and cost to the farmer with and without new investment in renovation. The important variable to the investor in a financial internal rate of return is the net cash flow at the beginning and the end of the period. Since coffee is a long term investment, some adjustments are needed to account for the time difference between expenditures made throughout the year, and income received at the end of the year. A simple

subtraction of income and expenditures does not take this into account. One way of addressing this issue is by adding the working capital required for the period. This was done in the analysis starting in the third year when production from new varieties planted in the first year becomes significant.

The analysis assumes an FOB export price of average hard bean coffee (3/92 futures, quoted 11/19/91) at $78 per quintal, with fluctuations of up to 10% above or below that figure. The farmgate price to the farmer would be approximately $52 per quintal. The Economic Analysis shown in Annex H is based on an FOB price of $97. January 1992 current prices conform to approximately 81% of the original baseline scenario. At that price, there would be no positive cash flow for a fully renovated cafetal until Year 6 and until Year 4 for partial renovation.

a. Total Renovation of a Coffee Plantation

Under the original baseline scenario, the financial internal rate of return to the farmer renovating in 1991 is 29 percent. If the expected price is reduced to 75 percent of the projected prices, the FIRR would be 16 percent (Annex H Table 13). If it is assumed that the export tax is maintained at its present levels, the FIRR would be 21 percent. An additional sensitivity analysis was tested to determine the effect of a reduction of expected yields by 20 percent. The result was a FIRR of 19 percent. A reduction of the expected international prices by 25 percent resulted in a FIRR of 8 percent. If the present export tax structure is maintained, the FIRR is reduced to 12 percent, and zero percent if prices are reduced by 25 percent. These FIRR's are not attractive enough to entice the farmer to invest in renovation. It is necessary to reduce the export tax gradually; otherwise, the small farmer will not have sufficient returns to renovate his old plantations.

b. Partial Renovation of a Coffee Plantation

The same analysis conducted for partial renovation resulted in higher FIRR due to the nature of the investment and the condition of farms that are suitable for partial renovation. A farm suitable for partial renovation produces more than one that needs total renovation, requires less investment, and the production response is more rapid. The FIRR for the base scenario was 46 percent. A reduction in prices to 75 percent of projections resulted in a FIRR of 35 percent (Annex H Table 14). If the export tax is maintained at present levels, the FIRR drops to 38 percent. If prices are reduced to 75 percent of projections and the export tax remain at present levels, the resulting FIRR was 25 percent.

A reduction in yields by 20 percent resulted in a FIRR of 30 percent, and 20 percent if prices are reduced by 25 percent. If the present tax structures is maintained, the FIRR drops to 23 percent and 10 percent if the prices are reduced by 25 percent.

Partial renovation seems a better alternative than total renovation. Unfortunately, it is not a matter of choice. Certain farms have the right conditions for partial renovation, while others are in such bad condition, that total renovation is the only alternative.

2. Cash Flow for Renovation

The cash flow analysis determines the feasibility of paying back a loan assuming the farmer borrows all the funds required. For this exercise the dollar values of income and expenditures were converted to colones. However, prices were assumed constant at 1990 levels.

Interest rate for investment was assumed at a positive real rate of seven percent per year and maintenance credit at a yearly rate of positive five percent. These rates are higher than present interest rates. Current nominal rates are 19 and 17 percent, respectively, and the inflation rate is estimated at 17 percent. This translates into real rates of two and zero percent. The analysis was conducted on a net basis, deducting the net income the farmer would obtain from the coffee trees he kept.

a. Total Renovation

An investment loan disbursed in two years, with three years grace period on capital and seven years term was assumed. Maintenance credit would be paid on a yearly basis, starting the third year. The analysis resulted in a positive cash flow starting the third year. By the fourth year, the cumulative cash flow was positive by more than one thousand colones per manzana. By the seventh year (1997/98) his cumulative cash flow would be over 15,000 1990 colones per manzana (Annex H Table 15).

b. Partial Renovation

An investment loan disbursed the first year, with two years grace period on capital, and a five years term was assumed. Maintenance credit would be paid on a yearly basis, starting the third year. The analysis resulted in a positive cash flow in the fourth year, and accumulated cash of more than four thousand colones the fifth year. The total accumulated cash would be over 28 thousand colones per manzana by the seventh year (Annex H Table 16).

F. Economic Analysis

1. Conclusions

The analysis using economic internal rate of return as the fundamental criterion of economic value concludes that the Project makes economic sense and USAID/ES should undertake it. Depending on the assumptions, the Project's economic internal rates-of-return range from 30 percent to 16 percent. Under very unlikely simulated alternatives, the economic internal rate of return (EIRR) might drop to 5 percent. Under probable scenarios the EIRR significantly exceeds the go/no-go critical return to capital, and thus favorably compares with any alternative uses for the capital resources involved. Moreover, the Project is likely to be an efficient foreign exchange earner. It has positive and strong potential positive impacts on GNP, foreign exchange, labor, farmer's earnings, the environment and employment.

There are few, if any, alternative uses for the areas planted with coffee, and none that would yield the same level of economic benefits. These include economic internal rate of return, generation of employment and

foreign exchange, as well as contribution to value added. Coffee is highly labor intensive, and all the additional production can be exported. Coffee provides excellent protection for the mountainous regions of the country, preventing soil erosion and degradation. The country has sufficient processing and marketing infrastructure in coffee as well as know-how and skilled labor not available for alternative crops.

2. Methodological Framework

The analysis uses the economic internal rate of return (EIRR) as the fundamental criterion for measuring the economic worthiness of the Project. This rate makes the net present value of the incremental flow of net economic benefits equal to zero. To calculate the EIRR, economic prices must be used. These are prices that reflect the true marginal value of production and the opportunity costs of resources. This involves adjusting financial or market prices when such prices do not reflect the true value of society's goods and resources.

The present analysis measures Project impact, thus benefits and costs, on a basis of "with and without Project" scenarios which show potential production, sales proceeds, and costs. Specifically, Project benefits are the difference in revenue product (physical production multiplied by sales prices) between the with and without Project scenarios. The increase in revenue product for all land units (one manzana = 0.7 hectare or 1.7 acres) that will directly benefit from the Project is the index of total gross benefits. Costs reflect the sum of production costs at the farm level, plus the Project resources utilized to begin technological development and transfer activities.

There are several alternatives for coffee farmers to increase production and productivity on their farms. These range from new plantings to total renovation to partial renovation and improved cultural practices. Partial renovation could be done with different levels of intensity. Furthermore, technology packages for total renovation vary in plant density, variety and levels of inputs. For the analysis, it was assumed that on the average there will be three standard models of project impact. These are total renovation (which includes new areas) with a level of density of 3,333 plants per manzana, partial renovation equivalent to a 50 percent replacement of existing trees, and improved cultural practices, which would increase yields slightly with a marginal increase in expenditures. The level of technology assumed in this economic analysis is consistent with what can be easily transferred to small farmers. Yields, costs, and profits per land unit are below results from advanced methods being used by some large farmers.

Coffee area expansion was treated as total renovation. This has a very conservative bias, resulting in a lower EIRR. Area expansion does not have the reduced production cost experienced with total renovation; thus, its impact is more positive.

The time horizon used in the analysis was 15 years, a conservative productive life for the coffee technology used in the Project. All prices and costs were kept constant at 1990 levels and are on a farm-gate basis.

3. Data Source

The main data source was ISIC which provided input prices for 1990, when the exchange rate was 7.90 Colones per US$1.00 (Annex H, Table 1). These prices were multiplied by the physical input requirements for total renovation (Annex H, Table 2), partial renovation (Annex H, Table 3), and improved cultural practices (Annex H, Table 4) for with and without (Annex H, Tables 5 and 6) project scenarios to develop budgets in 1990 US$ (Annex H, Tables 7 to 11).

International projected coffee prices were based on projections made by World Bank technicians. These projections are expressed in 1990 constant dollars (Annex H, Table 12), and are equivalent to the New York Coffee and Sugar Exchange prices. A differential is deducted to arrive at El Salvador's FOB price. This differential reflects shipping costs and quality discounts. Shipping costs are approximately US$8.00 per quintal. Due to the high average quality of El Salvador's coffee, it is expected that it will be getting premium prices, reducing the differential to $5.00 in 1991/92. These premiums are expected to increase due to the Project's impact, reaching a differential of zero by 1996. That is, the premium will be equal to the shipping cost.

The GOES is committed to reduce the coffee export tax, despite its deficit in annual tax revenues. For purposes of this analysis, two tax scenarios were run. One kept the tax regime as is and the other assumed the export tax was lowered to 20 percent above $45.00 in 1991/92, dropping to 10 percent in 1992/93, and disappearing in 1993/94. The CSC is expected to continue to receive $0.50 per exported quintal. Contributions to PROCAFE are estimated at one dollar per exported quintal. FOB price received by the exporter equals FOB prices minus the export tax, CSC registration fee including the contribution to PROCAFE. A deduction of $10.70 per quintal was made to account for coffee processing and handling to arrive at the farm gate price.

Financial costs were adjusted to determine the economic cost of the farm budgets with and without project situations. Unskilled labor was adjusted by 85 percent of the wages to take into account its opportunity cost. Imported inputs such as fertilizers are subject to duties. As such charges are transfer payments to the GOES, they do not reflect a loss of resources to the country. Accordingly, they must be deducted from the financial price. An adjustment was made in the farm budgets ("indirect taxes") to account for these and other taxes.

4. Key Indicators

The key economic indicators estimated were the economic internal rate of return, generation of employment and foreign exchange, the domestic resource cost of generating foreign exchange, and the value added to the economy.

5. Economic Internal Rate of Return

To calculate aggregate production per year for the without-project scenario, the number of manzanas affected each year was multiplied by the yield expected for each of the next fifteen years (Annex H, Table 17). The same exercise was done for the with-project scenario, and the net increment

was obtained by subtracting the two (Annex H, Table 18). To obtain the net economic cost for each type of intervention (total and partial renovation, and improved cultural practices), the same procedure used for production was followed. However, this time a set of tables was designed to estimate the necessary total additional working capital for each type of intervention (Annex H Tables 19 to 24).

The price considered was the export price, adjusted by the contributions to CSC and PROCAFE. Project investment costs were added to the production costs, and deducted from the net additional revenue to determine the net income. The resulting EIRR was 30 percent. A sensitivity analysis reducing the price by 25 percent resulted in an EIRR of 20 percent, and a further reduction by 40 percent resulted in an EIRR of 12 percent (Annex H Table 25). An analysis assuming a reduction of 50 percent in manzanas affected by the Project resulted in an EIRR of 27 percent with projected prices, 18 percent if prices are reduced by 25 percent, and 10 percent if prices are further reduced by 40 percent.

When the number of manzanas affected was reduced by 66 percent, the EIRR yielded 25 percent. A reduction in export price of 25 percent, reduced the EIRR to 16 percent. If prices are reduced by 40 percent, the EIRR resulted in nine percent. This last alternative is unlikely.

An additional sensitivity analysis consisted of reducing the expected yields by 20 percent. The EIRR was 22 percent. Reduction in expected prices by 25 and 40 percent resulted in EIRR's of 13 and five percent, respectively. This scenario is also unlikely. Another sensitivity analysis was to reduce the number of manzanas affected and reduce the yields by 20 percent. The resulting EIRR's were 20, 11, and four percent for the three price alternatives analyzed. Again, it is very unlikely that expected prices will be reduced by 40 percent for every year. One last sensitivity analysis was to delay renovations and improved cultural practices one year without reducing Project expenditures. This resulting EIRR's were 30, 20, and 12 percent for the three price alternatives.

6. Economic Benefits of the Project

Coffee production is highly labor intensive. By the first year of the Project, net employment will increase by over 800 person-years. This would increase gradually to more than 15 thousand by PACD (Annex H, Tables 26 and 27). A reduction of 50 percent in the area affected would reduce the employment effect by half. Further reductions in area affected reduce employment generation in the same proportion. In the scenario of reducing the yields by 20 percent, employment generation is reduced due to lower production. However, the effect of a reduction in production is still not very significant by the PACD. The largest production gains will be observed after the PACD. If renovations and ICP are delayed one year, there will be no additional employment generated in 1991/92.

The Project will have a net generation of more than 1.6 billion dollars over 21 years. This amounts to an average of over 70 million dollars per year. The net present value discounted at 15 percent is over 276 million dollars (Annex H, Tables 28, 29 and 32). If the number of manzanas is reduced 50 percent, the total foreign exchange generation drops to over 800 million dollars. The average would be 39 million per year, and the net present value 135 million. Further reductions in area affected

reduce the net generation of foreign exchange in the same proportion.

The domestic resource cost (DRC) of generating one dollar of exports is calculated to be 48 cents (Annex H Tables 30 to 32). If the manzanas affected are reduced 50 percent, the DRC increases to 51 cents. A reduction in manzanas by 66 percent, increases the DRC to 54 cents. A reduction in expected yields by 20 percent increases the DRC to 59 cents. If reduced yields are combined with a reduction in area affected by 50 percent, the cost of generating one dollar of foreign exchange increases to 63 cents. If coffee renovations are delayed one year, the DRC would be 49 cents.

Net value added to the economy will be more than 29 million dollars by the PACD. The sum of the value added over 21 years is more than 1.6 billion dollars. That is an average of 76 million dollars per year. The net present value at 15 percent discount is 286 million dollars (Annex H, Tables 33 to 35). A 50 percent reduction of the area affected would reduce value added by half.

The resulting foreign exchange generation and value added to the economy are very similar. This is because all additional production would be exported. Net use of foreign exchange has been deducted from export values to determine the net generation of foreign exchange. To estimate net value added, intermediate goods were deducted from the value of exports. A significant proportion of the intermediate goods are imported, resulting in similar values for foreign exchange generation and net value added.

IX. COVENANTS AND CONDITIONS PRECEDENT

The coffee industry has been a source of political friction in El Salvador due to the perception that it is controlled by a few wealthy groups. However, coffee provides income directly to over 30,000 rural smallholders and thus merits assistance. In order to raise funds from the industry as a whole, the GOES required PROCAFE to place in its statutes a commitment to serve all coffee producers, including the small farmer. Although in PROCAFE's statutes, and a focus of much of the AID-funded technical assistance, USAID's cooperative agreement with PROCAFE will include a covenant that PROCAFE will make special efforts to meet the technological needs of small coffee farmers.

Coffee production takes place in upland areas, often on steep hillsides. Without proper care, soil erosion from the 189,000 manzanas of coffee plantations can contribute an important quantity of sediment to El Salvador's rivers. Uncontrolled use of agricultural chemicals for coffee production can also contribute to water pollution. USAID's cooperative agreement with PROCAFE will include a covenant that PROCAFE will implement the recommendations of the Environmental Assessment PROCAFE will undertake with Mission participation at the beginning of the Project. PROCAFE will further use its best efforts to cooperate with soil erosion and pesticide programs undertaken by the Ministry of Agriculture through its Executive Secretariat for the Environment.

The Cooperative Agreement will include a condition precedent to first disbursement to ensure that PROCAFE has complied with USAID guidelines for adequate financial, administrative, and internal control systems. Further, PROCAFE will satisfy the Mission that its property management system is adequate to account for and control all Project-financed commodities.

The continued success of coffee technology improvement depends in part on the signing of an incomodato agreement (similar to a lease) between the Ministry of Agriculture and PROCAFE for the use of facilities formerly operated by ISIC. Therefore, the Project Agreement will contain a condition precedent to disbursment of funds for laboratory equipment, construction, and other fixed improvements, requiring that PROCAFE demonstrate that it has long-term access to the facility where Project-financed commodities would be installed and where improvements would take place.

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LOGICAL FRAMEWORK
Coffee Technology Transfer Project
519-0362

NARRATIVE SUMMARY	OBJECTIVE VERIFIABLE INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
GOAL:			
To revitalize the coffee industry El Salvador.	1. Annual export levels (quintales) 2. Estimated net return on coffee production. 3. Overall value of annual production in 1997 (in 1991 dollars) increased by 20% from the 1991 production levels.	1. MAG/Ministry of Finance/ Industry Data 2. Industry production export, and planting data. 3a. MAG crop data surveys. 3b. PROCAFE data from validation of technology packages.	1. Land invasions do not cause significant industry instability. 2. Macroeconomy remains stable. 3. World coffee prices remain stable at $70/quintal or higher.
PURPOSE:	**END OF PROJECT STATUS (EOPS):**		
To improve per unit yields and overall industry productivity of coffee producers, with a special emphasis on small producers.	1. PROCAFE will be providing assistance to plantations operated by 15,000 small farmers and 46 agrarian reform cooperatives. 2. For these farmers, PROCAFE will have assisted in bringing about and average yield of 20 quintals per manza (from quintales/mz. in 1991) by means of environmentally benign technology packages. 3. PROCAFE will have established a permanent coffee research and extension capacity.	1a. Records of extension visits, field day attendance. 1b. PROCAFE active membership. 2. MAG crop surveys Industry Records 3. Project documentation and evaluations.	1. Normal rainfall and weather patterns occur. 2. No new pest infestation occurs. 3. Ministry of Economy and CSC retain free market policies for coffee.

NARRATIVE SUMMARY	OBJECTIVE VERIFIABLE INDICATORS	MEANS OF VERIFICATION	MAJOR ASSUMPTIONS
OUTPUTS:			
1. 15,000 small coffee producers and 46 cooperatives will have received technology transfer services.	1. Number and location of producers and cooperatives.	1. PROCAFE extension records.	1. Medium term credit remains available for small farmers.
2. New technologies and improved cultural practices will have been applied to 120,000 manzanas of coffee lands.	2. 20,000 manzanas will be fully replanted, 31,250 manzanas will be partially replanted, and 68,750 manzanas will be cultivated under improved agronomic practices offered by PROCAFE.	2a. PROCAFE extension records. 2b. MAG crop surveys.	2. PROCAFE continues to attract competent staff.
3. Matured plantings will yield 25 quintals per manzana for fully replanted coffee, 20 quintals per manzana for partially replanted coffee, and 15 quintals per manzana for coffee under improved practices.	3. The current average national yield is 9 quintales per manzana.	3a. MAG crop surveys 3b. Industry data	
4. PROCAFE will have sustainable administrative, research and technology transfer units.	4. 68 trained technology transfer agents employed by PROCAFE; a research program is established and functioning; admin. systems comply with accepted practice.	4a. PROCAFE records 4b. Project evaluations	

INPUTS

AID	$000
Technical Assistance	5,862
Commodities	3,426
Construction	158
PROCAFE Operating Expenses	1,312
Training	862
Evaluation	136
Audit	244
Total	12,000

Salaries	3,716
Operating Costs	6,688
Building rehabilitation	846
Total	11,250

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Coffee Technology Transfer Project Paper

Annex B. Budget Detail
(Estimated Expenditures)

Source Selection Information

Description	Unit Cost	unit	No.	FY 92	No	FY 93	No.	FY 94	No	FY 95	No	FY 96	No.	FY 97	No.	Total	
AID Contribution	Dollar costs are adjusted for 5% inflation.																
Policy and Economics																	
Chief of Party	19090	pm	0	0	12	250789	12	251305	12	262647	3	68945	0	0	30	833686	
Economist	15070	pm	0	0	12	189882	12	190334	0	0	0	0		0	24	380216	
Commodities Proc Spec	12993	pm	0	0	9	122779	3	41024	0	0	0	0		0	12	163803	
Short Term Assistance	19090	pm	3	59693	9	188031	9	188479	0	0		0		0	21	436203	
Commodities	200000	budget	0	0	1	210000	0	0	0	0		0		0	1	210000	
Short Term Training	2000	pm	0	0	10	37800	10	37800	16	35200	0	0		0	62	110800	
Component Total																	2134718
Extension																	
Extension Specialist I	15070	pm	0	0	12	189882	12	190334	12	190924		0		0	36	571140	
Trng + Com Specialist	12993	pm	0	0	9	122779	3	41024	0	0		0		0	12	163803	
Microeconomist	15070	pm	0	0	12	189882	12	190334	0	0		0		0	24	380216	
Credit Advisor	12993	pm	0	0	12	163706	12	164095	0	0		0		0	24	327801	
Cooperative Advisor	12993	pm	0	0	12	163706	12	164095	0	0		0		0	24	327801	
Short Term Assistance	19090	pm	0	0	3	62677	3	62826	3	65662	3	68945		0	12	260110	
Vehicles and Equipment	1300000	budget	0	0	1	1365000		0		0		0		0	1	1365000	
Short Term Training	2000	pm	0	0	24	50400	24	50520	24	52800		0		0	72	153720	
Component Total																	3557501
Research																	
Agronomic Advisor	16640	pm	0	0	12	209759	12	210250		0		0		0	24	420016	
Genetics Advisor	16640	pm	0	0	12	209759	6	105129		0		0		0	18	314887	
Pest Advisor	11003	pm	0	0	12	138632	12	138962		0		0		0	24	277593	
Postharvest Advisor	11003	pm	0	0	12	138632	0	0		0		0		0	12	138632	
Short Term Assistance	19090	pm	3	59693	10	208924	10	209421	10	218073	7	168871		0	40	857781	
Laboratory equipment	1300000	budget		0	1	1365000		0		0		0		0	1	1365000	
Long Term Training	2700	pm	0	0	20	56700	49	139246	40	118800	12	37422	11	36019	132	388186	
Short Term Training	2000	pm	0	0	24	50400	24	50520	24	52800	24	55440		0	96	209160	
Component Total																	3971256
Admin and Support																	
PROCAFE Ops Expense	160000	mo	4	640000	4	672000	0	0	0	0	0	0		0	8	1312000	
Commodities	463000	budget	0	0	1	485829	0	0	0	0	0	0		0	1	485829	
Construction	104000	budget	0	0	1	109200	1	109460	0	0	0	0		0	2	218660	
Evaluation/Base line	235000	budget	0	0	0	71293	1	75000	0	0	0	0	1	90000	2	236293	
Audit	15000	budget	0	0	1	15750	1	15700	1	16500	1	17325	1	18191	5	83554	
																	2336436
AID Contribution Total				759385		7039200		2626044		1022205		408940		144210		12000000	12000000
PROCAFE Contribution	Local currency costs are adjusted for 13% inflation.																
Salaries	50000	mo	0	0	0	452000	12	600140	12	756000	12	854280	12	965336	56	3715756	
Operating Expenses	90000	mo	0	0	0	815600	12	1230852	12	1360000	12	1537784	12	1737696	56	6680362	
Office Support to Expats	500	mo	0	0	150	84750	130	74549	45	28350	30	21357	5	4022	360	213028	
Building Rehabilitation	560000	budget	0	0	1	632000	0	0	0	0	0	0		0	1	632000	
																	11249946
PROCAFE Contribution Total				0		1903150		2001341		2145150		2413341		2706964		11249946	
Project Totals				759385		9022350		4627385		3167355		2822289		2851174		23249946	
Dollar Inflation	0	five		1		1		1		1		1		1			
Colon Inflation	0	13		1		1		1		1		1		2			

Source Selection Information

TA Calculations	Base Salary per month	Allowances (all)	ODC (0.7 x salary)	HICB (0.65 x salary)	Monthly Cost (incl post diff)
Chief of Party PS 1/10	6950	2500	4871	4523	19895
Economist PS 2/8	5020	2500	3520	3268	15070
Researcher 1 PS 2/10	5659	2500	3961	3678	16640
Researcher 2 PS 2/10	5659	2500	3961	3678	16640
Researcher 3 PS 4/7	3401	2500	2381	2211	11003
Researcher 4 PS 4/7	3401	2500	2381	2211	11003
Short Term Assistance PS1/10	6950	2500	4871	4523	19890
Extension Specialist I PS 2/8	5020	2500	3520	3268	15070
Microeconomist PS 2/8	5020	2500	3520	3268	15070
Credit Advisor PS 3/7	4197	2500	2938	2728	12993
Cooperative Advisor PS 3/7	4197	2500	2938	2728	12993
Trng + Com Specialist PS 3/7	4197	2500	2938	2728	12993
Commodity Proc Spec PS 2/5	4882	2500	3417	3173	14705

Agency for International Development
Washington, D.C. 20523

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ENVIRONMENTAL THRESHOLD DECISION

Project Location	:	El Salvador
Project Title	:	Coffee Technology Transfer
Project Number	:	519-0362
Funding	:	$12 million (LOP)
Life of Project	:	5 years
IEE Prepared by	:	Edward T. Landau USAID/El Salvador
Recommended Threshold Decision	:	Positive Determination
Bureau Threshold Decision	:	Concur with Recommendation
Comments	:	An Environmental Assessment for the project will be carried out focusing on environmental issues associated with pesticide use under the technology transfer and on-farm processing components, as identified in the IEE and EA Scoping Exercise.
Copy to	:	Henry H. Bassford, Director USAID/El Salvador
Copy to	:	Edward T. Landau, USAID/El Salvador
Copy to	:	Mark Silverman, LAC/DR/CEN
Copy to	:	Frank Zadroga, REMS/CEN
Copy to	:	IEE File

John O Wilson Date APR -4 9

John O. Wilson
Deputy Environmental Officer
Bureau for Latin America
and the Caribbean

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INITIAL ENVIRONMENTAL EXAMINATION

BASIC PROJECT DATA

Project Location:	El Salvador
Project Title:	Coffee Technology Transfer
Project Number:	519-0362
Funding:	$12 Million (LOP)
Life of Project:	5 Years
IEE Prepared by:	Edward T. Landau USAID/El Salvador Coordinator of Environmental Issues
Date Prepared:	February 13, 1990

RECOMMENDATION FOR THRESHOLD DECISION

The continuing cultivation of coffee will have beneficial impacts on the environmental natural resource base of El Salvador. The planting of coffee and shading trees prevents soil erosion; enhances water conservation, lessens deforestation and allows stable land use. However, this project has technology transfer activities which may include the potential procurement and use of pesticides. In accordance with 22CFR Section 216.3 (b), the preparation of an environmental assessment is required when there is a potential use of pesticides.

The Mission agrees to incorporate in the project design and implementation of the techology transfer activities, the recommended measures approved in the Environmental Assessment.

Henry H. Bassford
Director
USAID/El Salvador

3/12/90
Date

Approved:

James Hester
LAC/Environmental Officer
AID Washington

Date

I. Project Description:

The goal of the project is to increase rural family incomes, to increase foreign exchange earnings and to contribute to the GOES fiscal balance. The purpose is to increase small and medium coffee farmer productivity, national coffee production and to improve the quality of coffee produced by project beneficiaries. The purpose will be accomplished through a coordinated effort of reform and strengthening of the institutional framework which supports coffee technology and transfer in El Salvador.

The project will support recent and proposed GOES efforts to increase the private sector's role in coffee's development by privatizing the major GOES coffee research institute (ISIC). Furthermore, the project will support the increasingly active reform and non-reform coffee associations, cooperatives and federations. The project will assist the organizations to play intermediary roles in the dissemmination of technology and the assurance of quality production.

The principal activities will be institutional strengthening and technology generation and transfer. Under the former, the project will work with the Salvadoran Coffee Council, the privatized ISIC, various coffee federations and other producer groups. Under the latter, the project will finance research, technology transfer and on-farm processing activities.

II. Environmental Review:

A. Project Review

Coffee cultivation has generally had positive impacts on the environmental and natural resource base, particularly in El Salvador. In this country, massive deforestation has taken place in every area. This has contributed to significant levels of soil erosion, lessened the ability to hold water, added to pollution of the water ways, silted dams and reduced productivity of the land. However, coffee cultivation, and the attendant need to plant shading trees is one area which has worked to conserve the delicate natural resource base. This cultivation has not only decreased soil erosion and water conservation, but indirectly lessens the demands on the few remaining forest areas in the country and provides habitat for many wild life forms, especially birds. That is, the pruning of coffee and shading trees provides substantial fuel wood for hundreds of thousands of Salvadorans, without the need to cut down forests. Further, coffee plantings are associated with stable land use.

This project will work on strengthening the institutional environment and technology transfer capabilities in the coffee sector. The technology transfer activities will concentrate on testing and disseminating new varieties of coffee, cultural techniques, cropping intensities and shading techniques, among other. However, there may be the need to experiment with various herbicides or pesticides to confront the various diseases and pest problems affecting coffee. The Project will also promote on-farm processing techniques

for small coffee producers. This practice is intended to maintain the qualit of the product, so that it retains a higher value in the market. The actitivities may lead to increased water usage and post-processing waste, of which some is recyclable and some is not.

B. Potential Environmental Impacts of Project Activities

The techology packages developed as a result of Project assistance might include fairly rigorous control of pests and diseases and elimination of weed. These requirements would most likely require use of fertilizers, pesticides and herbicides. The potential for misuse exists with concomitant negative impacts on human health and the environment. These chemicals may hav unknown persistence in soils, and may, if improperly used, increase possible human intoxication.

Although on-farm coffee processing will more than likely have negligible environmental impacts, some processing techniques do necessitate a stable supply of water and appropriate drainage and disposal techniques. Investments in the on-farm processing area will be based on a demostrated water supply, and appropriate drainage and disposal provisions. On the other hand, waste from coffee depulping can be used as an alternative to fertilizer and fuel wood, thus lessening the demands for forest resources and chemical inputs.

III. Recommendation:

Based on the above, and in accordance with 22CFR 216.3(b) "Pesticide Procedures", a Positive Determination is recommended for this Project. An assessment will analyze environmental issues associated with the following project components: (a) technology transfer; and (b) on-farm processing.

IV. IMPACT IDENTIFICATION AND EVALUATION

Impact Areas and Sub-Areas	Impact Indentification and Evaluation 1/
A. Land Use	
1. Changing the character of the land through:	
a. Increasing the population	N
b. Extracting natural resources	N+
c. Land Cleaning	N
d. Changing soil character	N+
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
5. Other factors	N

B. Water Quality

1. Physical state of water M
2. Chemical and biological status L
3. Ecological Balance N
4. Other factors N

C. Atmospheric

1. Air additives N
2. Air Pollution N
3. Noise Pollution N
4. Other Factors N

D. Natural Resources

1. Diversion, altered use of water L
2. Irreversible, inefficient commitments N
3. Other factors N

E. Cultural

1. Altering physical symbols N
2. Dilution of cultural traditions N
3. Other factors N

F. Socioeconomic

1. Changes in economic/employment patterns N
2. Changes in population N
3. Changes in cultural patterns N
4. Other factors N

G. Health

1. Changing a natural environment N
2. Eliminating an ecosystem N
3. Other factors N

H. General

1. International impacts N
2. Controversial impacts N
3. Larger program impacts N
4. Other factors N

I. Other Possible Impacts

1. Urban services N
2. Health services N

The following symbols have been used:

N	No environmental impact	U	Unknown environmental
L	Little environmental impact	+	Beneficial impact
M	Moderate environmental impact	-	Negative impact
H	High environmental impact		

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ANNEX C
ENVIRONMENTAL CONSIDERATIONS AND STRATEGIES FOR THE COFFEE TECHNOLOGY TRNASFER PROJECT

1.0 INTRODUCTION

USAID/ES is providing support to the people of El Salvador to rebuild their economy, severely affected by a decade of violence and political instability. The mission expects that rehabilitation of the coffee sector will have a strong economic impact in the overall economy of the country. Coffee has traditionally been the most important economic activity in El Salvador. It provides more jobs and foreign exchange than any other single activity. However, the sector has deteriorated during the last decade, as has the overall economy.

The Coffee Technology Transfer Project is aimed to recover the productivity of coffee plantations in El Salvador, which decreased to less than 50% during the last decade. At present, USAID/ES considers that lack of adequate technology is the main limitation to achieving high yields in coffee plantations.

One part of the problem is the decrease of the quality and extent of research activities in the country. In addition, the extension services could improve their efficiency in transferring the information. As a consequence, the small and poor coffee growers are the ones most adversely affected. They completely lack the technological resources required to improve their crops and increase their income.

Therefore, improving the quality and extent of applied research in coffee production and increasing the efficiency of technology transfer are critical components of the identified strategy to rehabilitate the coffee sector in El Salvador. Making technology available to the small and medium size coffee growers is an explicit objective of USAID/ES in this project. By doing this the mission seeks to increase income and employment opportunities for both small farmers and agricultural workers.

Strategic actions in the project include strengthening the technical assistance services through grower associations and privatization of the country's coffee research institution, Instituto Salvadoreño de Investigaciones del Café (ISIC). Keeping ISIC out of the political context of public institutions is likely to guarantee adequate research and training of extension agents.

Coffee is also important for the conservation of natural resources in El Salvador. It reduces the pressure on forest remnants because pruning from coffee and shade trees provides substantial quantities of firewood. It also provides an alternative vegetation cover which reduces the risks of erosion on mountain slopes, where it is usually planted. Conservation of natural resources for sustainable long-term economic growth, as well as increased foreign exchange earnings, job availability, and small farmer income as in explicit component of the USAID/ES strategy for the country.

The purpose of this annex is to address rehabilitation of the coffee sector, within the context of the general environment, and the natural resource base of El Salvador. By doing this, I expect to provide suggestions for project design in order to enhance potential benefits, and reduce the risks of negative effects.

2.0. COFFEE AND THE ENVIRONMENT

Coffee agro-ecosystems, as well as any other human managed systems, relate with the environment in a number of ways. Several kinds of human activities (inputs) interact with existing soils and weather conditions through different processes and develop a characteristic structural pattern. A close relationship exists between structures and processes which affect ecosystem components and influence the nature, timing and quantity of outputs.

Variable inputs include technology, coffee seeds, labor, and agro-chemicals. Fossil fuels are also involved in transportation and processing of cherries to the final stages of exportable coffee beans. Outputs include coffee and coffee wastes, firewood, and sediments. The structural pattern is determined by soil conservation techniques, density of coffee plants, and diversity and density of shade trees and wind breaks. Animal life diversity is also determined by these structural patterns.

Improving coffee yields implies modifications of the structure and function of traditional coffee agro-ecosystems. Nowadays, those transformations are geared to higher densities of coffee plants and reduced densities of shade trees. These changes reduce diversity and simplify ecosystem structure. There is a change in the circulation pattern within the system. The flows of materials going in and out the system (inputs and outputs) are larger. More coffee is produced as a result of increased system output. However, this is only possible by increasing rates of fertilizers and other agro-chemicals, labor, and fossil fuels. In general we can talk about a higher level of inputs.

For practical purposes, this report looked at the changes on soils, firewood, pesticides use, wastes from the processing, and biodiversity which are likely to occur with the application of higher coffee production technology.

3.0. SOIL CONSERVATION

Soil degradation is the more important environmental problem in El Salvador. Every year millions of tons of fertile soils are washed to the ocean, due to the lack of adequate vegetation cover. Coffee plays an important role in protecting soils, because it provides an arboreal vegetation over a significant portion of the country. Less than 25% of El Salvador is covered by arboreal vegetation, according to the arboreal vegetation map (CENREN, 1981). Coffee plantations represents more than 36% of that arboreal vegetation cover.

Therefore, a project oriented to maintain coffee plantations by increasing yields is beneficial for soil conservation. If coffee loses profitability, coffee plantations could be converted to other uses including annual crops. However, with the application of higher technology we should at least review the effects on soil erosion and soil acidification.

3.1. Soil Erosion

The protective role of coffee plantations, against soil erosion is even greater than the numbers suggest. They usually cover steep slopes where otherwise serious erosion would occur. Furthermore, coffee growers usually implement a series of soil conservation practices which also help to prevent soil erosion. Most commonly used soil conservation practices include contour planting, individual terraces, live barriers, and small trenches to promote water infiltration and retain soil particles. Wind breaks, common in several coffee growing areas in El Salvador, also give additional protection against soil erosion. In many cases those wind breaks actually act as live barriers, which complement the effect of the ones existing within the plantation itself.

There are two set of factors characterizing soil erosion: those facilitating and those resisting it. Actual erosion rates are a consequence of the interactions of these factors at any particular time and location. When dealing with hydric erosion, rainfall and slope are the driving factors because they provide the power to remove and transport soil particles. Vegetation cover, soil physical properties, and soil conservation practices are erosion resisting factors because they decrease the total amount of energy available per unit time.

Structural patterns based on more coffee plants and less shade trees imply more intensive utilization of the soil. (Tosi et al., 1985) In the extreme case of completely open plantations, land suitable for coffee moves from class VI to class IV in a ten class classification system. Increased erosion risk arises from a less protective vegetation cover, changes in soil physical properties, and insufficient soil conservation practices.

Vegetation Cover: Erosion increases when bare soil is exposed to erosion agents, particularly direct rainfall which causes disaggregation of soil particles and facilitates motion. The rate of bare soil exposure is likely to increase under the new higher technology for coffee production. Usually, when a coffee field is completely renovated, both coffee plants and shade trees are eliminated. New plants take time to develop and reach full soil cover.

Other reasons for increased bare soil exposure include weeding and pruning practices. Because weed competition is more important in a high yield system, weed control is more strictly enforced either by herbicides applications or manual cutting. In addition, coffee growers prune their plants more often to maintain a larger proportion of fruit producing

tissue in the field. Pruning is usually done by rows or plots.

When pruning is done by rows, one out of four or five rows is cut and allowed to grow back every year. When done by plots, the same 20 to 25% of the area is cut and allowed to grow every year. However, because the pruning by plots is done in blocks, a greater rate of erosion is likely due to increased length of time of unprotected slopes. Plot or block pruning greater than 20% should be avoided in slopes.

Soil Physical Properties: In reducing erosion risk in coffee plantations, water infiltration capacity and resistance to shear stress are the most important soil physical properties. To a certain extent both related to the density of shade trees.

When a larger proportion of rainfall goes into the soil, less water is available to run off and contribute to soil erosion. Soil infiltration rates may decrease as a result of a decrease in organic matter content. Reduced numbers of shade trees are likely to decrease the litter fall in coffee plantations, which is the primary and free source of soil organic matter. Litter fall reduction can be compensated with green manures and organic fertilizers.

Reduction of shade tree density can lead to increase of soil instability and rate of slumping. This is particularly true in areas with very steep slopes. Under those circumstances, deeper root systems of shade trees provide protection against shear stress. Shade trees should be maintained when renovation of coffee plantations is taking place in areas with high risk of slumping.

Soil Conservation Practices: Soil conservation practices play a more important role in preventing soil erosion in higher technology coffee plantation. Research staff at ISIC is aware of that fact and has the adequate knowledge and scientific background to handle the problem. However, several causes might prevent implementation of soil conservation in real life.

The most important obstacle may be the cost involved. Renovation of coffee plantations is a very capital intensive activity. Therefore, growers are reluctant to expend considerable amounts of money in soil conservation practices, especially when their income is limited by low international prices or inadequate tax structure.

Another hinderance may be the technical assistance personnel's lack of awareness of the extent of damage which can be caused in the plantations as well as other ecosystems downstream.

3.2. Soil Acidification

Soil acidification in the fertilization band has been well documented by research personnel at ISIC. The problem arises from the application of nitrogen fertilizer, particularly ammonium sulphate and urea, when corrective measures are not implemented. The most common corrective measure is the application of dolomite lime. The technology to prevent soil acidification is available at ISIC but implementation is limited by the same variables limiting adequate implementation of soil conservation practices. The risk of soil acidification is likely to increase because of increased fertilizer applications.

The metabolic rate of coffee plants increases under more illuminated conditions as a result of shade reduction. More solar energy is available for photosynthesis, which in turn causes an increase in nutrient demand. More fertilizer and lime are actually needed. However, growers are more sensitive to fertilizer than lime needs. Therefore, they tend to over fertilize without applying the required corrective doses of lime. Lack of adequate understanding of the causes and extent of this problem by technical assistance personnel might be very detrimental for long-term coffee productivity.

3.3. Strategies to Prevent Soil Deterioration

The new ISIC or PROCAFE will implement a Soil Management and Conservation Program which will prevent the negative effects of soil erosion and acidification. This program will assure soil conservation through tax exemptions, regulatory actions, research and monitoring, and education and training.

The costs of soil conservation will be deducted from coffee export taxes. The required legislation to regulate the application of such incentives to soil conservation will be developed during the first year of the project.

Soil conservation will be explicitly addressed at all relevant stages of project implementation. Evaluation of the risk of soil erosion and acidification and the preventative actions will be included in the loan applications. Credit will be approved only if the assessment risks and remedial actions prove to have a positive outcome.

In order to strengthen ISIC's present research and monitoring capabilities, a soil management specialist with experience in coffee will provide help with the design of experiments and monitoring needs. This professional will arrive during the first year of project implementation for an initial period of six months. He will return every year for a three month period to follow up the progress made and provide additional guidance.

The other component of the soil management program will be training on soil management under coffee production and general

environmental protection. A short course (24 hours) in soil and water conservation will be taken by all extension agents and/or "paratecnicos." Anyone directly providing technical assistance, in the field for coffee production will have to pass the course before the end of the project. This course will be implemented in small groups (25-35 people). Approximately 8 short courses will be given.

4.0. FIREWOOD PRODUCTION

Firewood is the most important energy source in El Salvador. According to the energy balanced for the 1970's, firewood accounts for 56% of total energy consumption in the country (CEL, 1980). Actual consumption in 1979 was approximately 4.0 million tons. The same source considers that pruning of coffee plants and shade trees provides approximately 1.16 million tons of firewood per year, representing 29% of the consumption in 1979.

Average production of firewood from coffee fields was estimated in the order of 8.0 tons per hectare per year (THY). Firewood production from coffee fields increases as elevation decreases. In lower areas (bajios) the estimated production is in the order of 10 THY. At medium elevations it drops to around 6 THY, and at high elevations it is only about 4 THY.
No information is available on the proportion of firewood coming from individual system components, i.e., coffee plants versus shade trees. However, the differences between altitudinal belts suggest that the shade tree component might be far more important at low elevation. Shade increases as elevation decreases, therefore in "bajios" the larger production of firewood comes from a greater shade component.

At high elevations, the role of coffee plants themselves might be more important. Looking at the firewood that can be generated by pruning of coffee plants under high density (7143 plants/Ha.) can be illustrative. Pruning will remove 20% of the plants every year. Assuming that each coffee plant yields 2 Kg. of firewood, the annual production will be approximately 3 THY, or 75% of the measured value. These estimates are in agreement with the opinion of coffee technicians. Napoleon Irigoyen, head of the Agronomy Department at ISIC, believes that under adequate management shade trees do not produce substantial quantities of firewood because yearly pruning only allows removal of thin plant material.

With faster growth rates at lower elevations sites, firewood production from coffee plants might increase as much as 50%. However, the figure (4.5 THY) is far away from the 10 THY mentioned earlier. Even with the contribution of shade trees it is not likely that the 10 THY could be reached, 7 THY may be a more realistic value. Therefore, the total production of firewood from coffee might decrease as a result of structural changes promoted in plantations to increase yields.

However, it is important to point out that the previous analysis applies in the long term. In the short term, however, an increase

in coffee renovation activity might increase firewood availability. Data from "El Molino" coffee farm at mid-elevation suggests that renovation of old coffee plantations might yield as much as 65 THY when all bio-mass is removed. This is equivalent to eight years production at the average rate estimated by CEL for 1979.

In conclusion, firewood production from coffee plantations might stay the same in the short and mid-term (5-10 years) because higher yields from total renovations will compensate lower production of already renovated areas. In the long-term, however, there might be a decrease of firewood production. Although it is very difficult predicting the reduction in firewood production, the numbers suggest a contraction of 20 to 25%.

A palliative for this situation could be to increase the production of precious wood from coffee fields. Wood imports will consequently decrease and foreign exchange savings could be used to purchase alternative fuels. In this respect low densities (5-10 trees/Ha.) of precious timber species (mahogany, cedro, laurel, etc.) will not compete for light because after a few years they will be quite above the canopy of coffee and shade trees.

To provide help for the development of alternatives to increase wood production in coffee plantations, the project will provide an agro-forester. This professional will work with the Agronomy Department staff at PROCRAFE to evaluate the best species and densities at different elevations. He or she will be available for three month a year during the five years of the project.

Another way to decrease the impact of reduced firewood supply from coffee fields is to reduce consumption during the processing. Approximately 2 tons of firewood are required in processing 10 QQ of finished coffee beans. Therefore, at present rate of production (3 million QQ) total consumption is approximately 60,000 tons, which roughly represents 5% of firewood production from coffee plantations. However, firewood consumption for processing of coffee will increase as yields go up.

"Pergamino" and dry pulp could provide as much as 85% of processing requirements of firewood, according to Ramos (pers. com.). Utilization of "pergamino" for this purpose does not represent a problem and is largely being done already. However, pulp has to dry first in order to be utilized. According to the same source, residual heat available in most facilities can be combined with previous pressing to reduce moisture content in the pulp from 85-90% to about 20%.

Additional savings could come from improving the efficiency of energy transformation in the processing plants. As an average, Ramos (pers. com.) estimates that energy efficiencies are in the order of 65%, with some plants having values as low as 58%. The project will make available an engineer specialized in heat transfer and energy saving practices for four months. This professional will identify the potential areas for improving efficiencies and reducing the consumption of firewood as well as

other fuels. In addition, the project will consider incentives, such as tax exemptions, which can be made available to processing plants in order to accelerate their modernization. The idea is that sound processing will save fuels and prevent environmental degradation.

5.0. PESTICIDE USE

Increased pesticide use is expected with the implementation of the project. At present, very few growers implement control programs even for the major pest (fruit borer or "broca") and main disease (coffee rust or "roya"). Although the project is not going to finance or distribute pesticides to project beneficiaries, the growers are expected to purchase and apply pesticide in their crops to protect the high yields required to pay for the investment.

ISIC staff at the plant pathology and entomology departments considers that lack of adequate education is the more serious problem in relation to pesticides in El Salvador. The Environmental Assessment (EA) produced by Higgins, et al. (1988) suggests that increasing abuse of pesticides is causing chronic or acute poisoning, contamination agricultural products, and stimulating resistant pests.

Usually, pesticide use does not provide lasting control for pest or diseases. Organisms affecting agricultural crops tend to develop some kind of resistance, which decreases the effectiveness of a given pesticide over time. The best way to avoid resistance is to utilize pesticides as one of multiple tools under the context of Integrated Pest Management (IPM).

ISIC staff is already looking at the problem of coffee pest and disease control under the umbrella of IPM. However, the program will be strengthened by accelerating the development of local IPM strategies as well as validating strategies developed elsewhere, for example those generated by PROMECAFE. Therefore, the project will provide an IPM specialist for three months every year during project life.

Even under IPM strategies pesticides are always going to be required as one of several tools to control pests and diseases. The current list of pesticide recommended by ISIC for use in coffee include some products that are in the restricted use (RU) category of EPA. These products, however, might be critical to control pest outbreaks at a given time. Competitiveness of participating farmers might be in jeopardy if these products are not used. Therefore, the project will provide the required training to all extension agents and request that they are accepted as "certified" applicators by AID/W. The IPM specialist will develop the content of the training course to meet the requirements of similar extension agencies in the U.S. A certified extension agent will be present when restricted use pesticide are use in individuals farms. Eight seminars will be given to cover the total population of extension agents and cooperating farmers (paratécnicos).

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Also, other products such as endosulfan (used to control the broca beetle) are not registered in the U.S. The same argument about competitiveness applies for such products. The project will request approval for utilization of those pesticides, based on residues tolerances established by WHO and/or FAO.

To guarantee that pesticides are being used as appropriate, and that coffee is free of illegal residues, a quality control program will be implemented. For this purpose the project will contract the analysis with FUSADES/DIVAGRO, which is already developing quality control capabilities with support from USAID/ES under the Agribusiness Development Project.

The quality control laboratory at FUSADES/DIVAGRO can provide additional help in monitoring the fate of critical pesticides in the environment. (For example, residues of carbofuran and/or endosulfan and their metabolites in soil and streams). An environmental monitoring plan will be developed with the help of the IPM specialist. Cooperation will be sought with other public and private agencies including: The Presidential Commission for the Environment, the Ministry of Health, the Salvadoran Ecological Foundation (FESA), the Executive Committee for the protection of Water Resources (CEPRHI), the Water and Sewer Agency (ANDA), and the newly created Laboratory for the Environment of the Center for Natural Resources (CENREN).

6.0. WASTES MANAGEMENT

Generation of several kinds of waste materials from the processing of coffee cherries, is a well-known fact in all coffee-growing areas. Although the problem exists in El Salvador, its magnitude is expected to increase as a consequence of increased coffee production. Every year during the harvesting and processing season, streams and rivers are contaminated in El Salvador. Ing. Rafael Rubio from the laboratory for the environment indicated that it is common to find a biological oxygen demand (DBO) in excess of 20 mg/l. As an example, he mentioned that water of Suquiapa River completely lacks oxygen during the coffee processing season.

By-products from coffee processing include pulp, waste waters, and peelings (cascarilla or pergamino). Waste waters carry mucilage (suspended solids, sugars, and soluble organic materials) and the effluent of fermentation tanks, which contains colloidal gel of pectines, and other organic substances. Processing of coffee cherries produces :

PRODUCT	RANGE %
Pulp	38 - 40
Mucilage	18 - 20
Pergamino	3.9 - 4.0
Coffee beans (11-12% moisture)	19 - 20
Water	16.9 - 17

ISIC has been fully aware of contamination problems caused by coffee wastes long time ago. The best solution identified was the integrated management of coffee wastes including utilization of by-products for several different purposes. The institution initiated a program to utilize coffee by-products in 1979 under the Department of Chemistry and Soils. However, the program has only hired one chemical engineer and lacks adequate operating support including laboratory facilities, vehicles and operating expenses. From experiences at ISIC and other coffee growing areas several options are now available for controlling contamination.

6.1. Solid Wastes

Two different kinds of solid wastes are generated by coffee processing, pulp and "pergamino." For every quintal of finished coffee beans this industry generates about 2 QQ of pulp and 20 lbs. of "pergamino." Therefore, production of 3 millions QQ of finished coffee beans, generates approximately 330,000 metric tons of solid wastes. Several technologies to deal with these problems are very promising. But further research is needed to precisely establish costs and economic benefits.

"Pergamino" is not a significant problem because it is already used in most processing facilities (beneficios) as a substitute for firewood. The project will encourage the utilization of this material for energy generation purposes in beneficios which are not using it now. An alternative use of "pergamino" is pressing and compaction to make agglomerated panels.

Pulp is the main solid waste problem due to the volumes involved and limited present utilization. Nowadays, pulp is mainly deposited in trenches or open areas in the surroundings of processing facilities. This practice provides an ideal growth environment for flies and other insect which become a nuisance while the pulp is decomposing. In order to ameliorate the fly problem it is becoming a common practice to spray the piles of pulp with insecticides, therefore increasing the environmental problem.

Coffee pulp is organic matter and therefore an energy source which can be used for several purposes. Decomposed pulp can be used as organic fertilizer in coffee fields. This practice would help to maintain the levels of organic matter in the soils. (The risks of reduction in the content and its implications were discussed in 3.1. above.) Some growers are already implementing this practice, but the rate of utilization is limited by the speed of the decomposition process. To accelerate the rate of decomposition several approaches have been used including the application of enzymes, yeast and other microorganisms, and forced aeration.

Other potential uses for pulp include organic substrate for growth of edible mushrooms, insect larvas, and as a substitute for firewood in the boilers of the beneficios. The latter has already been discussed in 4.0. above. Insect larvas can be used as a protein source for the preparation of feed-stuff for chicken and/or

aquaculture. Recycling organic products is not new in El Salvador. Chicken slaughtering houses are already using organic residues to produce chicken meal, which is provided to feed-stuff factories to reduce costs.

Two programs in FUSADES which are receiving USAID/ES support are willing to cooperate with PROCAFE in the development of the required technology to make those potential uses economically viable: DIVAGRO and PROPEMI. DIVAGRO indicated that mushrooms and insect larval protain are potential agro-industries. PROPEMI could consider extending its activities in support of the small and micro enterprise to rural areas. The project will contact those agencies to promote research cooperation.

6.2. **Waste Waters**

According to Rivera (pers. com.), coffee processing consumes substantial amount of water. The bulk of water consumption is as vehicle for pulp transport. The last national evaluation made in 1972 indicated that about 1.5 cubic meters of water were required per QQ of finished coffee. Using a total production of three million QQ we find that about 4.5 million cubic meters (MCM) of water are required to process the coffee crop, which is a significant amount of water. If we use a value of 50 liters per person per day 4.5 MCM will provide domestic water for a population of 250,000 people. These numbers are likely to increase as coffee production increases.

At present, average water consumption might be lower than mentioned above. Several processing plants are now recycling water mainly due to scarcity. This is achieved by separating the external water from the pulp and re-integrating it into the coffee processing. However, further reduction of water consumption is important not only to save water for other uses but also to make the waste water problem easier to handle. Preliminary work done at ISIC suggest that consumption can be reduced to less than 10% its value in 1972 (Rivera, pers. com.).

At a minimum, waste waters will not be discharged directly into surface water bodies. To assure PROCAFE or other institutions (Consejo Nacional del Café) will authorize the operation of processing plants. Oxidation ponds will be required to collect the water, which will partially percolate and evaporate. The ponds will be large enough to avoid overflow. Sediments will be collected and disposed in nearby fields when dry at the end of the season. Enforcing this regulation is likely to promote spontaneous water saving because the size of ponds will decrease as consumption decreases.

Other options are possible. Waste waters can be utilized to irrigate nearby crop fields. They can also be anaerobically digested to produce "biogas". Biogas has about 70% methane and 30% carbon dioxide. It can be used as a fuel in the processing plants contributing to save additional quantities of firewood or other sources of energy.

6.3. Program for Utilization of Coffee By-Products and Environmental Protection

The ultimate goal of this program should be a pollution free coffee production and full utilization of by-products. However this might not be possible throughout the life of the project. A more realistic objective is the prevention of contamination from pulp and waste water. Therefore the project will concentrate in the utilization of pulp to produce organic fertilizer and the establishment of adequate retention ponds at processing facilities sites At the same time research will be undertaken for more permanent and economic alternatives.

To achieve this goal, the project will provide the required support to the original ISIC by-products utilization program. Assistance will include two additional employees (biologists) a vehicle, laboratory equipment, and operating expenses. Furthermore the project will provide three month of foreign technical assistance per year. Technical assistance will be in different fields including production of organic compost, biogas production, and design of retention ponds. The program will be geared to generate the appropriate technology under the Salvadoran conditions.

7.0. BIODIVERSITY

Implementation of higher technology in coffee plantations is likely to have a negative effect on biodiversity due to the reduction of shade trees. The effect is two fold because of the tree species themselves and the habitat they provide for other animals. When coffee is completely renovated, new shade trees planted include only a few species of *Inga*, "pepeto". In Appendix 1, a list is provided of the plant and vertebrate species which occur in coffee plantations.

Planting of timber trees in low densities was mentioned in 4.0. The presence of those trees will provide habitat for wildlife and increase biodiversity in coffee fields. The project will encourage farmers to plant several species of shade trees to further introduce plant and habitat diversity into the system. Furthermore, by controlling water pollution from coffee wastes the project will promote recovering lost biodiversity in rivers and streams.

Finally, the project will also encourage the protection of buffer strips of vegetation along rivers and streams. Buffer strips are recognized to have a beneficial effect in the biodiversity of surface water bodies. They filter sediment and other pollutants from agricultural water run-off. Buffer strips also benefit terrestrial biodiversity because they are used as corridors by wildlife species. The concepts of buffer strips and how to establish them will be covered in the soil and water conservation short courses.

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MINISTERIO DE AGRICULTURA Y GANADERIA.

CENTRO DE RECURSOS NATURALES.

SERVICIO DE PARQUES NACIONALES Y VIDA SILVESTRE.

FLORA Y FAUNA SILVESTRE ASOCIADA A LOS AGRO-ECOSISTEMAS DE CAFETALES EN EL SALVADOR.

A - FLORA SILVESTRE ARBOREA RARA, SUCEPTIBLE DE SER DESPLAZADA POR LA INTENSIFICACION DEL MANEJO DE CAFETALES, DE ACUERDO A DIFERENTES RANGOS ALTITUDINALES.

1. Vegetación de zonas bajas (500 a 800 m.s.n.m.)

Familia	Nombre Botánico	Nombre Comun.
Anacardiaceae	*Astronium graveolens*	Ron Ron.
	Spondias cirouella	Jocote de Pava.
	Spondias radlkoferii	Jocote Jobo.
Annonaceae	*Cymbopetalum stenophyllum*	Orejuelo.
	Rollinia rensoniana	Chirimoya.
Apocinaceae	*Aspidosperma megalocarpon*	Candelo.
Bignoniaceae	*Godmania aesculifolia*	Cacho de novillo.
	Tabebuia donell-smithii	Cortez Blanco.

	Tabebuia impetiginosa	Cortéz Negro.
Bombacaceae	*Ceiba aesculifolia*	Ceibillo.
Capparidaceae	*Capparis indica*	Curumo.
	Crataeva tapia	Granadillo.
Clethraceae	*Clethra mexicana*	Zapotillo.
Chrysobalanaceae	*Licania arborea*	Roble de costa.
Elaeocarpaceae	*Sloanea terniflora*	Terciopelo.
Lauraceae	*Ocotea veraguensis*	Pimiento negro.
Leguminosae		
Mimosoideae	*Inga fagifolia*	Caspirol.
	Piptadenia constricta	Hormiguillo.
Caesalpinoideae	*Hymenaea coubaril*	Copinol.
	Poeppigia procera	Mamble.
Papilionoideae	*Myroxylum balsamum*	Bálsamo.
Meliaceae	*Cedrella salvadorensis*	Cedro Salvadoreño.
	Swietenia humilis	Caoba.
Moraceae	*Brosimum allicastrum*	Ojushte de Verano.
	Brosimum terrabanum	Ojushte de Invierno.
	Chlorophora tinctoria	Palo de mora.
	Ficus obtusifolia	Matapalo.
	Ficus morazaniana	Amate peludo.
Myrtaceae	*Eugenia salamensis*	Guacoco.

Polygonaceae	Coccoloba barbadensis	Papaturro Negro.
Rubiaceae	Genipa americana	Irayol.
Rutaceae	Zantoxylum kellermanii	Pochote.
Sapindaceae	Sapindus saponaria	Pacún.
Sapotaceae	Manilkara chicle	Nispero Silvestre.
	Mastichodendron capirii	Tempisque.
	Pouteria campechiana	Guaycumen.
Simaroubaceae	Simarouba glauca	Acaituno
Tiliaceae	Apeiba tibourbou	Peine de mico
Vervenaceae	Citharexylum donnell-smithii	Chorrito

2. Vegetación de zonas medias (800-1200 m.s.n.m.)

Familia	Nombre Botánico	Nombre Común
Apocynaceae	Tonduzia longifolia	Chilindrón
Araliaceae	Dendropanax arboreus	Mano de Leon
Eheretiaceae	Bourreria huanita	Palo de Rosas.
	Cordia panamensis	Manune.
Euphorbiaceae	Drypetes lateriflora	Aluminio.
Flacourtiaceae	Lunania mexicana	Tizón.

Guttiferae	*Calophyllum brasiliense*	Rario.
	Rheedia edulis	Chaparrón.
Lauraceae	*Nectandra sinuata*	Cashulahuacate.
	Phoebe mexicana	Pimiento Rojo.
Leguminosae		
Mimosoideae	*Inga calderonii*	Zapato de mico.
	Inga oerstediana	Cuje purito.
	Leucaena shannoni	Hormiquillo rojo.
	Pithecellobium arboreum	Guaje.
Papilionoideae	*Dalbergia funera*	Funera.
	Dussia cuscatlanica	Cashal.
	Eysenhardtia adenostylis	Taray.
Malpighiaceae	*Bunchosia cornifolia*	Murmuy.
Malvaceae	*Hampea stipitata*	Masagua.
Melastomataceae	*Miconia argentea*	Cirin Nicaraguense.
Meliaceae	*Trichilia martiana*	Cola de pava.
	Guarea tuerkheimii	Huevo de mico.
Moraceae	*Ficus velutina*	Amate peludo.

	Ficus maxima	Amate.
	Ficus crassiuscula	Amate de olor.
Rubiaceae	*Exostema mexicanum*	Quino.
	Simira calderoniana	Limpiadientes.
Rutaceae	*Casimiroa edulis*	Matazano.
	Zanthoxylum macrocarpum	Pochote amarillo.
Sapindaceae	*Exothea paniculata*	Palo de Cuiliote.
Sapotaceae	*Chrysophyllum mexicanum*	Caimito rojo.
Styracaceae	*Styrax argenteus*	Estoraque.
Tiliaceae	*Luehea speciosa*	Tepecaulote.
Ulmaceae	*Celtis monoica*	Duraznillo.
Verbenaceae	*Cornutia pyramidata*	Palo de cangrejo.

3. Vegetación de zonas altas (1200 - 1800 msnm).

Familia.	Nombre Botánico	Nombre común
Actinidaceae	*Saurauia kegeliana*	Alais
Araliaceae	*Oreopax xalapensis*	Mano de leon
Apocynaceae	*Stemmadenia eupracteata*	Cojon

Compositae	*Perimenium grande*	Tatascamite amarillo
	Montañoa xanthiifolia	Tatascamite rojo
Fagaceae	*Quercus aata*	Roble malcote.
	Quercus pilaria	Roble blanco.
	Quercus sapotaefolia	Roble rojo.
	Quercus skinneri	Belloto.
Lauraceae	*Litsea glaucescens*	Laurelillo.
	Phoebe acuminatissima	Pimiento negro.
Leguminosae		
Mimosoideae	*Inga hintonii*	Cuje.
Moraceae	*Ficus tuerkheimii*	Matapalo de tierra fria.
Myricaceae	*Myrica cerifera*	Vegetal.
Proteaceae	*Roupala glaberrima*	Zorrillo.
Rosaceae	*Prunus lundelliana*	Sapuyulo.
Rubiaceae	*Chiococca phaenostemon*	Quino.
Sapindaceae	*Cupania mollis*	Cola de Pava.
Ulmaceae	*Chaptoptelea mexicana*	Mezcal.
	Lozanella enantrophylla	Chichicaste blanco.

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B - VERTEBRADOS NO CONSIDERADOS BAJO AMENAZA O PELIGRO DE EXTINCION EN EL SALVADOR, QUE HABITAN COMUNMENTE EN LAS AREAS DE CULTIVO DE CAFE, O REGIONES NATURALES CON CARACTERISTICAS AMBIENTALES EQUIVALENTES.

C - VERTEBRADOS AMENAZADOS O EN PELIGRO DE EXTINCION EN EL SALVADOR. QUE OCURREN EN AREAS DE CULTIVO DE CAFE O EN REGIONES NATURALES CON CARACTERISTICAS AMBIENTALES EQUIVALENTES.

Nombre Científico	Nombre Común	Estado	Ap. CITES
PECES			
Agnostomus monticola	Tepemechín	En Peligro	-
ANFIBIOS			
Rhinophrynus dorsalis	Sapo de hule	En Peligro	-
REPTILES			
Coleonyx mitratus	Gecko	Amenazado	-
Lepidophyma flavimaculatum	Gecko	Amenazado	-
Mabuya mabouya	Lagartija	Amenazado	-
Gerrhonotus moreletti	Lagartija de pliegue	En Peligro	-
Boa constrictor	Masacuata	Amenazado	II
Loxocemus bicolor	Masacuata de hule	En Peligro	-
Oxybelis fulgidus	Vejuquilla verde	En Peligro	-
Spilotes pullatus	Chichicúa	Amenazada	-
Lampropeltis diliata	Falso coral	En Peligro	-
Angkistrodon bilineatus	Cantil	En Peligro	-
AVES			
Sarcoramphus papa	Rey Zope	En Peligro	II
Leptodon cayanensis	Milano	Amenazado	II
Ictinea plumbea	Milano	Amenazado	II

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Accipiter erythronemius	Halcón	Amenazado	II
Accipiter cooperi	Gavilán de Cooper	Amenazado	II
Accipiter striatus	Gavilán	Amenazado	II
Leucopternis albicollis	Gavilán blanco	En Peligro	II
Buteo magnirostris	Gavilán de alas anchas.	Amenazado	II
Buteo nitidus	Gavilán gris	Amenazado	II
Buteo platypterus	Gavilán de alas anchas.	Amenazado	II
Buteo swainsoni	Gavilán de Swainson	Amenazado	II
Buteo albonotatus	Gavilán	Amenazado	II
Buteo jamaicensis	Gavilán cola roja	Amenazado	II
Parabuteo unicinctus	Gavilán pintado	En Peligro	II
Buteogallus anthracinus	Gavilán cangrejero	En Peligro	II
Herpetoptheres cachinnans	Guás.	En Peligro	II
Spizaetus tyrannus	Aguila crestada negra.	En Peligro	II
Geranospiza caerulescens	Gavilán.	Amenazado	II
Micrastur ruficollis	Halconcilla	En Peligro	II
Caracara plancus	Querque.	Amenazado	II
Falco preregrinus	Halcón peregrino	Amenazado	I
Falco rufigularis	Halconcillo	En Peligro	II
Crax rubra	Pajuil	En Peligro	-
Penelope purpurascens	Pava de monte	En Peligro	-
Penelopina nigra	Chacha negra	En Peligro	-
Claravis mondetoura	Tortolita	En Peligro	-
Geotrygon montana	Paloma montañera	En Peligro	-
Geotrygon albifascies	Paloma montañera de cara blanca.	En Peligro	-

Tamandua tetradactyla	Tamandúa	En Peligro	II
Cyclopes didactylus	Hormiguero lanudo	En Peligro	-
Nasua narica	Pezote	Amenazado	-
Jetinkia sumichrasti	Huyo	Amenazado	-
Eyra barbara	Perico ligero	En Peligro	-
Spilogale putorius	Zorrillo de lomo de lomo blanco.	Amenazado	-
Mephitis macroura	Zorrillo	Amenazado	-
Felis concolor	Puma	En Peligro	I
Felis wiedii	Tigrillo	En Peligro	I
Felis pardalis	Tigrillo manigordo	En Peligro	I
Felis yagouaroundi	Gato zonto	En Peligro	I
Coendu mexicanus	Puerco espin	Amenazado	-
Agouti paca	Tepezcuintle	En Peligro	-
Dasipus novemcinctus	Cusuco	Amenazado	-
Tayassu tajacu	Cuche de monte	En Peligro	-

Aratinga holochlora	Pericón	En Peligro	II
Aratinga canicularis	Catalnica	Amenazado	II
Brotogeris jugularis	Chocoyo	Amenazado	II
Bubo virginianus	Búho barba blanca	En Peligro	II
Pulzatrix perspicillata	Búho de Anteojos	Amenazado	II
Ciccaba nigrolineata	Búho blanco y negro	En Peligro	II
Ciccaba virgata	Búho moteado	Amenazado	II
Glaucidium brasilianum	Aurora	Amenazado	II
Otus cooperi	Búho de Cooper	Amenazado	II
Otus trichopsis	Búho manchado	Amenazado	II
Tyto alba	Lechuza	Amenazado	II
Caprimulgus vociferus	Pucuyo	Amenazado	-
Campilopterus hemileucurus	Gran colibrí azul	Amenazado	-
Hylocharis eiliae	Colibrí cola dorada	En Peligro	-
Amazilia cyanura	Colibrí cola azul	En Peligro	-
Eugenes fulgens	Colibrí de Rivoli	Amenazado	-
Doricha enicura	Colibrí tijereta	En Peligro	-
Trogon mexicanus	Coa.	En Peligro	-
Trogon collaris	Coa de collar	En Peligro	-
Aspatha qularis	Talapn montañero	Amenazado	-
Aulacorynchus prassinus	Tucán verde	En Peligro	-
Pteroglossus torquatus	Pico de navaja	En Peligro	-
Piculus rubiginosus	Carpintero café	En Peligro	-
Dryocopus lineatus	Montañero	Amenazado	-
Dendrocopus villosus	Carpintero moteado	En Peligro	-
Chironectes paamensis	Tacuazin de agua	En Peligro	-
Ateles geoffroyi	Mono araña	En Peligro	:

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ANNEX D
TECHNICAL CONSIDERATIONS AND PRODUCTION PROJECTIONS

A. RESEARCH

1. Introduction

El Salvador is in the only country in Central America which has a research institute exclusively dedicated to the generation of technology in coffee. Costa Rica, well known for its high coffee technology with remarkable success in obtaining high yields per unit area, does not have a single source of technology. Technology is supplied by several institutions; the Ministry of Agriculture, the universities, the "Centro Agronómico Tropical de Investigación y Enseñanza" (CATIE), and the Coffee Institute of Costa Rica, ICAFE. A similar situation occurs in all other countries of the area. In El Salvador, however, there are no alternatives sources of basic information. In other words, if there is no coffee research institute, the productive sector of the country would have to rely entirely on the technology available now and on the work of other countries in the future.

Under present circumstances is such a research institute warranted? Technology is now available, and if the appropriate coffee varieties from guaranteed seed sources are planted, a substantial increase in productivity and production easily could be obtained, assuming that proper transfer technology, education and extension programs were implemented.

However, a careful study of the coffee industry revealed that such an approach would be very short sighted and potentially dangerous. To guarantee a competitive and sustainable coffee industry, integrated and inter-disciplinary research is necessary to preserve the natural resources in danger of being altered and re-establish the biological equilibrium in the soil and environment. High yielding, disease-tolerant coffee cultivars must be selected and stabilized. Such a cultivar has been bred in Kenya at the Coffee Research Institute at Ruiru, Tolerant of coffee rust and coffee berry disease while retaining the famous flavor and quality of Kenyan coffee, this dwarf tree allows for higher population densities. This has permitted the liberation of some 20,000 ha of coffee lands for badly needed food production.

Further research is also necessary to maintain an adequate nutrient level in the soils for the future to avoid what might be called a "technology of waste" and to establish the basis for a true "technology of replacement."

New and better harvest and post-harvest practices must be explored to continuously upgrade quality and make the mills more cost efficient. Detailed studies of mill-yields, i.e. conversion from berry to dry coffee must be made. These are the basis for the calculation of price as paid farmers.

Research is needed to deal with the problem of the waste disposal from coffee mills. A study made by CONICIT in Costa Rica has demonstrated that the coffee wastes in a watershed of the Rio Grande de Tarcoles alone represents a daily rate of 192 metric tons of Biochemical Demand for Oxygen. Coffee wastes account for 67.6% of the total pollution of the country. Not only is it necessary to learn how to cope with this problem in an ever more efficient way, but to investigate the means of converting these wastes into sub-products of economic value.

The most promising known production on technology should undergo regional validation after which it could be transferred to all farmers, including small ones. This would permits a change from the old pattern of supplying low technology to the small farmer. It should be possible to implant high technology on a small portion of his coffee plantation and apply a maintenance technology on the rest of his plot until the high technology portion of the farm generates enough income to renovate the rest of his property.

2. Review of ISIC

Prior to making recommendation for stile organizational structure, staff requirements and research activities of PROCAFE, we conducted a review of the organization, programs and staff capacities of ISIC.

The technical personnel available, some of whom are qualified to carry out modern research, nevertheless lack training in some of the specialized research activities required to provide the generation of technology needed for upgrading all aspects of coffee production. Morale of most personnel is generally low, and internal communication is sporadic. In most cases support personnel for professional staff are clearly insufficient. Experiments and data collection activities are severely constrained. In varying degrees, the entire staff needs training to up grade its capability of performing the research work required.

Distribution of the available space is inappropriate, and the buildings have deteriorate. It would be hazardous to install expensive equipment under such conditions. We note for example, that the Plant Pathology laboratory also contains a growing chamber and a laminar airflow bench, while also serving as a tissue laboratory for the Department of Plant Breeding. To a greater or lesser degree, similar situations were seen in all the departments visited. Transportation limitations usually render proper field work almost impossible.

3. Observations and Comments

The activities at ISIC provide some indications of the present status of coffee research in El Salvador. The observations and commentaries that follow provide some guidance for the design of the new research unit in PROCAFE.

(a) The Department of Genetics & Physiology

A large collection of genetic materials exists, but until now no single tree selection was made, a mistake now being corrected.

To obtain more stable populations, most of the varieties, even some of those of wide commercial distribution, should be carefully monitored with regard to characteristic of seeds and yield potential.

The so called Pacamara, a cross of Paca and Maragogipe is of particular interest. This coffee has raised great expectation even beyond the borders of El Salvador. It has large beans which command a premium on the market, especially the market for specialty coffees. It is not a coffee to be reproduced on a very large scale, but it has its usefulness for gourmet coffee shops. However, Pacamara cannot be called a variety, because it is still segregating to various degrees, particularly in those plantations controlled by ISIC,

Pacamara needs to be developed further. It is not rust resistant, still segregating in various degrees, both in phenotype and of course in seed characteristic. It is said to express itself very uniformly in the F2 generation. The possibility therefore exists to reproduce it via micropropagation in the tissue laboratory. The possibilities of embryogenesis should also be explored.

This department should be in charge of the certified seed and nursery plant production. One air conditioned seed laboratory with a moisture meter, scales, sieves containers, pesticides and storage facilities would be needed. The preparation of the seeds can be carried out in the coffee processing facilities described in another section.

The well-known commercial variety of Catuai has been observed in commercial plantations still segregating in phenotype. Actually, this should not occur, illustrating the need for close control over the seed and nursery production by an agency such a PROCAFE. The project should only use guaranteed material for distribution to the farmers.

For the year 1991 a total amount of approximately 14.500 kg. of seeds are expected to be harvested, 60% of it by ISIC and 40% from seed plots on private plantations but under the control of the Institution. This is the equivalent of about 33 million plants, which at the density of 3.500 plants/Ha covers an area of 9500 Ha in single stem or 4.762 Ha in double stem plantings.

(b) **The Department of Agricultural Engineering**

This department exists practically only on paper and cannot operate if not provided with the necessary equipment and materials, as well as a minimum of auxiliary staff.

The personnel of the department presently consists of 2 non-specialized Ing. Agrónomos, 1 Lic. in Education, 1 Ing.Agr. specialized in Agro-Meteorology, and 1 Secretary.

The department makes evaluations of spray equipment, designs bulletins for the calibration of spray equipment, and gives advice on soil irrigation.

The meteorologist has studied the micro-climate in the green house and the climate in the coffee growing area of El Salvador. He issues monthly bulletins on weather in and around Santa Tecla, and collaborates with different departments of ISIC in matters related to agro-meteorology and climate in general.

Except for a processing plant, equipment is almost non-existent. The whole processing plant consists of one Penagus pulper, a make-shift de-huller with an engine and two fermentation bins. Some experiments have been carried out on density of parchment coffee, optimal use of water in the mill, and yield determinations.

The department should measure erosion in coffee plantations which have different soil types, inclinations and ground covers. This should be done in collaboration with the soils department which would analyze the soils for organic matter and nutrient level. Other trials should be carried out to test erosion control with shade trees and windbreaks.

The department should also evaluate the different irrigation systems: overhead, drip and underground with porous tubing to study their usefulness in regulating the flowering of coffee. This work again has to be done in close relation with the soils department and the departments of plant pathology, entomology and nematology.

Continuing research of harvest and post-harvest practices is necessary to assure high quality coffee at reduced costs. It is therefore unthinkable to have a coffee research institute without proper processing facilities. These should include a laboratory for a complete analysis of the quality as well as facilities for cup tests. The processing plant should be large enough for commercial processing and include all the well known equipment viz. fermentation and/or mechanical mucilage remover, classifiers and wasting channels, patios for sun drying and artificial dryers with indirect fire furnace. Wood and the parchment of the coffee can be used as a heat sources. It should also include a pump for re-utilization of the water to reduce water consumption and provide inoculum for the fermentation tanks to accelerate the process.

At the same time, the processing plant must be equipped to mitigate a negative impact on the environment and convert waste-products such as pulp and partially degraded mucilage from the fermentation tanks into valuable substrate for growing edible fungi or rearing larvae for animal feed and biological fertilizer. The degraded mucilage of the fermentation tanks may be used to produce bio-gas and the water should be purified via "metanogenic" bioconversion, as designed by ICAITI of Guatemala.

(c) **Department of Plant Pathology**

This department easily can be made fully operational with the necessary funding and some additional training of the personnel.

The department carries out research on chemical control of diseases and the biological agents causing the diseases and investigates the pathology of the resistance of coffee spp **Hemileia vastatrix** to another pathogenic fungi.

This department is now working on the following diseases:

In the seed beds:
-- **Rhisctonia solani K**
Inadequate use of agro-chemicals (phytotoxicity)
-- **In the nursery:**
Cercocpora coffeicola
Deficient use of agro-chemicals (phytotoxicity)
With the introduction of new varieties (catuai and some catimors in particular) & cultural practices (less or no shade), this disease should be studied in relation with the nutrient status of the plants.
Inadequate use of agro-chemicals (phytotoxicity)
Fields trials
Field trials are carried out on the following diseases:
-- **Cercospora coffeicola**
-- **Mycena citricolor**
-- **Phyllosticta coffeicola**
-- **Hemileia vastatrix**
-- **Colletotrichum sp.**
-- **Ceratocystis fimbriata**
-- **Rossellina sp**
-- **Fusarium sp**
-- **Corticium salmonicolor**
-- **Pericullaris koleroga**

Inadequate use of agro-chemicals (phytotoxicity)
More work has to done on:

-- Research in the field of losses caused by diseases
-- Correct use of pesticides in relation to phytotoxicity and the negative impact disease control
-- Evaluations of fungicides to control leaf rust, **Hemileia vastatrix** Berk & BR, **Cercospora coffeicola** and the influence of nitrogen, phosphorous and potash on the **solani** in the seed beds (compared with the effect or use of solarization to control the disease)
-- Studying the biology of **Fusarium spp.** and **Rossellinia spp.**
-- Studying the susceptibility of the germplasm derived from the Hybrid of Timor to the commonly known diseases of coffee
-- Quantitative evaluation of resistance of the genetic materials to group E
-- Determination of races of **Hemileia vastatrix** in ES

(d) The Departments of Entomology, Soils and Agriculture Chemistry and Agronomy and Diversification

These departments are ill-equipped and understaffed. No clearly defined programs are being carried out.

The responsibilities of these departments are clear from their names. Budgetary limitations prevent proper discharge of these responsibilities.

(e) Department of Validation

Validation trials, not commonly carried out for tree crops, hold great promise as a means of testing and demonstrating the effects of the new technologies. Typically, validation plots include a control plot in which traditional cultivation practice are carried out and others in which elements of the new technologies are applied in various configurations. These plots, if used extensively throughout the coffee regions, will be invaluable as technology transfer instruments as well as valuable research "laboratories."

4. **Project Design Implications**

The review of ISIC's operation, though incomplete, provides some useful guidelines for design of the research unit of PROCAFE.

- Operational budgets must be funded at levels of sufficient magnitude to allow technical personnel to be used advantageously. Operational funding levels for research operations of the type contemplated by PROCAFE are usually about 50% of personnel costs. ISIC's personnel/operation cost ratio was about 95/5.

- If PROCAFE is to use ISIC's facilities, it will have to extensively renovate them.

- Only a fraction of ISIC's equipment is adequate. Prior to finalization of PROCAFE's equipment budget, it will be necessary to compare equipment needs with equipment availability from ISIC's inventory.

- Most of ISIC's technical staff are academically qualified for the posts they hold. Many could be hired by PROCAFE and, with guidance and discipline of senior staff or long term consultant personnel, could be valuable in its research program.

- Some programs initiated by ISIC are well conceived and have progressed reasonably well. These can be picked up immediately by PROCAFE and advanced further.

- The organization of the research units should correspond to the purposes for which research is undertaken. In

addition, the overall research effort should be under the direction of a Research Director and respond to priorities set out in a formalized research plan.

Research personnel will be PROCAFE's greatest asset. They should be paid well and be able to expect tenured careers with PROCAFE.

These considerations were taken into account in the proposed design of the reasonable organization. The organizational units and their functions are described in Annex E.

5. **The Production Effects of Technology Transfer**

The organizational procedural requirements for technology transfer are outlined in Annex E.

Variations of three basic transfer models, (1) improved cultural practices, (2) total renovation and (3) partial renovations, will be offered to planters, and the planters will be assisted in implementing the models adopted. Examples of these and their production effects are summarized below. Although the models are shown as being particularly suitable for specific types of planters, the models could be applied to plantations of any size.

6. **Production Effects of Three Coffee Renewal Models**

Small Coffee Growers Farms: (0-20 manzanas*)
Borbon 2500 trees/manzana, today's production "7 qq oro"/mza.

A/ **Cultural Practices** (C.P.)

1) Pruning
2) Weed Control
3) Fertilizer
4) Pest Management

Yr	1	-	Start					
Yr	2	-	3 qq/mza	Increased	Production			(0+3)
Yr	3	-	4 qq/mza	"	"	"	"	(0+3+1)
Yr	4	-	5 qq/qq	"	"	"	"	(0+3+1+1)
Yr	5	-	5 qq/qq	"	"	"	"	--

Total production 11/12 qq/mza (should stabilize at this amount)

B/ **Partial Renovation and Cultural Practices,** (PR+CP)
(Replanting/2000 Trees/mza Pacas or another dwarf variety. Today's production "8 qq/oro"/mza (2.5 varas ** x 2 manzanas); will plant another 2000 trees (distance 2.5 x 1 varas).

* manzana = 7050 m2 (0.705 hectare; 1.745 acres; 10,000 varas)
** vara = 84 cms. (spanish measurement + 33 inches)

Yr 1 (seed beds/nurseries/planting of 50% of area + pruning, weed control fertilization, and pest management.

Yr 2 Increased Production (seed beds/nurseries/planting of 50% of area + cultural practices (CP)) (0+3 qq/from CP)

Yr 3 Increased Production
CP (0+3+1) = 4
1er. Renov. (0+0+5)
increments total 11 qq/mza

Yr 4 Increased Production

CP	(0+3+3+1)	7	
1er Renov.	(0+0+5)		8
2a Renov.	(0+0+0+5)	5	
INCREASED TOTAL		20 qq/mza	

Yr 5 Increased Production

CP	(0+3+3+1+0)	7
1st. Ren.	(0+0+5+3+2)	10
2nd. Ren.	(0+0+0+5+3)	8
INCREASED TOTAL		27 qq/mza

Should stabilize at 27 qq/mza increased, and base will drop to 5qq.

C/ **Total Renovation or New Plantation**

1. Pacas or other dwarf variety, 5000 trees/mza/(2 varas x 1 vara)
2. Catuai or other "Dwarf rust tolerant" and fast growth varieties '4000 trees/mza (2.5 varas x 1 vara)

In C1. The pruning cycle is 5 years, once systematic pruning per year is initiated you "cut back a row of 1000 plants per manzana per year."

In C2. The pruning cycle is 4 years. Usually 1000 trees per manzana per year are cut back, but since there are less trees because of the greater planting distance and morphology of these Hybrids.

Yr. 1 Seed bed/nurseries, land clearing and plating
Yr. 2 5 quintals of production
Yr. 3 15 quintales of production
Yr. 4 25 quintales of production
Yr. 5 35 quintales of production
Yr. 6 45 quintales of production
Yr. 7 35 quintales of production. Initiate pruning system.

Stabilized yearly productions of 35 qq/mza.

7. <u>Partial Renovation of Medium and Large Size Farms</u> (20-60 mzas, 60 mzas. and more).

A/ Borbon 2000 - 2500 trees/mza; today's base production is 7 quintales/mza.

Cultural practices (CP). Weeding, pruning, fertilization, pest management) + replanting to obtain of 3000 tree density per manzana (3 varas x 1 vara)

Yr.	1	Cultural practices + seed beds, nurseries, and planting	
Yr.	2	Increased production	5qq
Yr.	3	Increased production (CP) (0+5+5)	20qq
Yr.	4	Increased production (CP) (0+5+5+3-10) (R) (0+0+10+10+5)	33qq
Yr.	5	Increased production (CP) (0+5+5+3-10) (R) (0+0+10+10+5)	28qq

Production should stabilize at 30 to 35 qq oro/mza/year.

B/ 1. Dwarf varieties such as Pacas/Caturra/Villa Sarchis with actual plant populations of 2000 to 3000 trees per manzana.

2. "Dwarf, rust tolerant" Hybrids of varieties such as CATUAI, CATIMOR, TIKISIC, etc.

Using the C/1 system "Dwarf varieties the farmer will use appropriate cultural practices (pruning, weeding fertilization, pest management) plus increase of renewed plantings to bring the plant population to 5000 trees per manzana (2 varas x 1 vara). The C/2 or "Dwarf rust" tolerant varieties or Hybrids use 4000 trees per manzana. The systematic pruning cycle is the same as explained in C1 and C2 under small coffee farms.

During the project period 43,000 manzanas will brought under improved cultural practices, 19,750 will be totally renovated and 22,500 partially renovated. At the yield rates noted above, production from these plantings would reach 884,000 quintals at PACD. Production by cultivation categories is shown in Table 1 attached.

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Coffee Production Under New Technology Applications 1991-1995

1st 1991 Plantings		2nd. 1992	3rd. 1993	4th. 1994	5th. 1995	Total
4,750	1 CP	9,000	10,000	12,000	12,000	
	T	2,000	4,000	6,000	7,750	
	P	2,000	5,000	7,000	8,500	
Production						
Yr1						29
1cp	29					
T						
P						
Yr2						120
1cp	47	63				
T	-	-				
P	-	10				
Yr3						267
1cp	52	90	70			
T	-	10	-			
P	-	20	25			
Yr4						510
1cp	52	99	100	84		
T	-	30	20	-		
P	-	40	50	35		
Yr5						884
1cp	52	99	110	120	84	
T	-	50	60	30	-	
P	-	66	100	70	43	

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PRODUCTION ASSUMPTIONS WITH NEW TECHNOLOGY APPLICATIONS

	ICP	Total Renovated	Partial Renovated
1st yr	7 q/m	-	5 q/m
2nd yr	10 q/m	5 q/m	10 q/m
3rd yr	11 q/m	15 q/m	20 q/m
4th yr	11 q/m	25 q/m	33 q/m
5th yr	11 q/m	35 q/m	30 q/m
6th yr	11 q/m	35 q/m	30 q/m

When allowance is made for the negative production effect of lands temporarily taken out of production in the early stages of renovation, net incremental production would total 256,000 quintals.

ANNEX E

INSTITUTIONAL ROLES AND ORGANIZATIONAL CHARACTERISTICS (PROCAFE)

The juridical nature and internal governance of PROCAFE is set out in its statutes which are shown as Appendix 1 of this document. The Foundation is governed by a Board of Directors elected from the major coffee associations in El Salvador. The Board answers to the General Assembly of PROCAFE which is made up of any coffee producers who pay a nominal fee (100 colones) and join. The General Assembly ratifies or rejects the actions of the Board.

The day-to-day operations of the Foundation are managed by a Director General hired by the the Board of Directors. The Director General's office is made up a small number of support staff and includes an Economic Studies Unit and a Library as well. In addition to the Administrative Directorate, the institution is organized into three major operational units, A Directorate of Administration, a Directorate of Research and a Directorate of Technology Transfer and Communications.

The Director General is advised and supported by his administrative team which is composed of the Directors of the three Divisions, and a Consultative Group which is comprised of public and private persons with interests in coffee who constitute a non-binding advisory group. Furthermore, a Research Management Advisor (Technical Assistance Team Leader) offers advice and facilitates communication between the Foundation and the USAID Project Manager.

The operational and administrative structure contains an appropriate mix and number of personnel and facilities to carry out well defined functions for cost effective attainment of objectives as indicated in the outline below:

I. General Directorate

A. Office of the General Director
   1. Personnel
      a. Executive Director
      b. Sub-Director
      c. Secretary
      d. Bi-lingual Secretary
   2. Technical Assistance
      a. Team Leader--Mgmt Advisor (60 months)
   3. Equipment: Computer and communication systems
      Vehicles (4)
   4. Principal Activities
      a. Responsible for day-to-day direction of the foundation and carrying out the orders of the Board of Directors.
      b. Develop and maintain relationships with domestic and foreign counterparts and organizations.

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B. Economic Studies Unit
1. Personnel
   a. Chief Economist
   b. Economist--Cost Specialist
   c. Economist--Credit Specialist
   d. Associate Economists (2)
   e. Secretary
2. Technical Assistance
   a. Senior Economist (24 months)
   b. Short Term (3 months)
3. Equipment: Computers and communication systems
   Vehicles (2)
4. Principal Activities
   a. Advise the Director General in matters related to economics and coffee.
   b. Establish professional economic relationships with the CSC and other technical national and international coffee organizations.
   b. Design, direct and coordinate a census of coffee producers and harvest estimates.
   c. Conduct studies such as estimates of production, costs of production and processing, marketing, prices, transportation, etc.
   d. Collaborate with other divisions in the economic validation of research results.
   e. Analyze and report upon the terms and avaialbility of investment and production credit in El Salvador for coffee producers, especially small and medium size producers.

C. Library
1. Personel
   a. Head Librarian
   b. Assistant Librarians (2)
   c. Secretaries (2)
2. Technical Assistance
   a. Short Term (3 months)
2. Equipment: Computers, photocopier, audio-visual, communications
   Vehicles (Access to pool)
3. Principal Activities
   a. Aquire and maintain publications and documents related with the acitivities of PROCAFE.
   b. Maintain mutually supporting relationships with other libraries and documentation centers relevant to coffee technology.
   c. Working with researchers and transfer agents, identify and acquire relevant professional journals and periodical publications.
   d. Develop a proactive program of providing a range of user services appropriate for the institution and its clients.

II. Directorate of Administration

A. Accounting Division

1. Personnel
   a. Chief Accountant
   b. Controller
   c. Auditor
   d. Secretary--Clerk (3)
2. Technical Assistance--None
3. Equipment: Office equipment, computer and communication systems
   Vehicles (Access to pool vehicles)
4. Principal Activities
   a. Maintain accounts for the foundation in a manner acceptable to Board of Directors and AID.
   b. Assist in all matters of accountability
   c. Pay and receive monies for the foundation using commonly accepted practices.
   d. Maintain a petty cash fund
   e. Make regular financial reports and special reports as directed by appropriate authorities.

B. Personnel Division

1. Personnel
   a. Personnel Manager
   b. Secretary--Clerk (2)
2. Technical Assistance--None
3. Equipment: Computer and communication systems
   Vehicles (Access to pool vehicles)
4. Principal Activities
   a. Maintain personnel records on all employees.
   b. Maintain records of membership.
   c. Assist in development of personnel policies, evaluation tools and work schedules.

C. Maintenance and General Services Division

1. Personnel
   a. Chief of Maintenance
   b. Maintenance Personnel (4)
   c. Drivers (4)
   d. General Service Personnel (4)
   e. Field Personnel (8)
2. Technical Assistance--None
3. Equipment: Cleaning supplies, farm and repair tools.
   Vehicles (Access to pool vehicles)
4. Principal Activities
   a. Maintain and repair the physical facilities of the foundation, including buildings and grounds, interior and exterior
   b. Maintain and repair small field equipment
   c. Working with researchers, care for various experimental plots and research laboratories

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d. Maintain control over warehouses, spare parts, etc.
e. Keep maintenance records on vehicles and other equipment and insure that timely repairs are made when necessary. (Note: Major vehicle repair will be contracted out.)
f. Make recommendations to the Director of Administration on matters regarding maintenance and care of the facilities and equipement
g. Supervise and assist temporary field personnel

II. Research Directorate

A. Office of the Research Director
1. Personel
a. Director
b. Secretary
2. Technical Assistance
a. Short Term (64 months to be distributed among departments)
3. Equipment: Office equipment, communications, etc.
Vehicles (Pool of 8 vehicles)
4. Principal Activities
a. Direct the research activities of the Division and develop a modern, relevant research capability within the foundation.
b. Maintain mutually supporting relationships with other divisions, especially providing the transfer agents with timely, relevant research results.
c. Represent the interests of the Research Division within the foundation and throughout the research community, both in El Salvador and abroad.
d. Make recommendations to the Director General on matters regarding the foundation's research program.

B. Environmental Management Division
1. Personnel
a. Division Head (Soils Scientist)
b. Agro-forestry/Agro-meteorology specialists (2)
c. Associates (3)
d. Assistants (2)
e. Secretaries (2)
2. Technical Assistance
a. Environmental Mgmt (12 months)
b. Agro-forestry (15 months)
c. Short term as assigned by Director
3. Equipment: Meteorology, soils, forest and water research equipment
Vehicles (Access to research pool)

4. Principal Activities
   a. Studies on the causes, impacts and prevention of soil acidification.
   b. Studies on environmental contamination caused by cultural and processing practices related to coffee.
   c. Studies on agrochemical residuals in coffee and the environment.
   d. Studies of the impact of shade trees and other ground cover associated with coffee on the environment.
   e. Studies on erosion, soil conservation and windbreaks.

C. Integrated Pest Management Division
1. Personnel
   a. Division Head (Plant Pathologist)
   b. Entomology/Nematode/Weed Specialists (3)
   c. Associates (4)
   d. Assistants (5)
   e. Secretaries (2)
2. Technical Assistance
   a. Integrated Pest Mgmt Specialist (18 months)
   b. Short term as assigned by Director
3. Equipment: Entomology, nematode and fitopathological laboratory equipment
   Vehicles (Access to research pool)
4. Principal Activities
   a. Epidemilogical studies on the principle diseases and pests of coffee.
   b. Design of economical integrated pest management programs.
   c. Weed and insect population studies and methods for their control.
   d. Diagnosis of nematode damage and methods of prevention and control.
   e. Tests of varieties which are resistant or tolerant to coffee pests and diseases.
   f. Tests of agrochemicals and application equipment.

D. Genetics Division
1. Personnel
   a. Division Head (Geneticist)
   b. Plant Breeder/Tissue Culture Specialists (2)
   c. Associates (2)
   d. Assistants (2)
   e. Secretaries (1)
2. Technical Assistance
   a. Geneticist (18 months)
   b. Short term as assigned by Director
3. Equipment: Laboratory and field equipment for genetic materials research

Vehicles (Access to research pool)

4. Principal Activities
   a. Collection of plant materials worldwide to increase and diversify domestic stock of genetic materials.
   b. Evaluation of improved plant materials, selection and breeding of adopted varieties for resistance, productivity, tolerance, etc.
   c. Aprovechar el cultivo de tejidos en forma practica para clonar materials prometedoras de generaciones tempranas.
   d. Production of certified seed and control over the quality of seed introduced from other sources.

D. Agronomic Management Division
1. Personnel
   a. Division Head (Agronomist or Horticulturalist)
   b. Plant Physiology Specialist
   c. Associates (3)
   d. Assistants (3)
   e. Secretaries (2)
2. Technical Assistance
   a. Agronomist (18 months)
   b. Short term as assigned by Director
3. Equipment: Laboratory and field equipment

   Vehicles (Access to research pool)
4. Principal Activities
   a. Revise and update manuals of cultural practices.
   b. Research improved methods of rehabilitation for coffee stands, including techniques of pruning, planting distances, use of shade, etc.
   c. Conduct basic studies on the impacts of light, water, temperature, nutrients, trace elements, etc. on the productivity and profitability of coffee.
   d. Commercial control (chemicals and equipment) of major coffee pests and diseases.
   e. Develop systems of intercroopping and alternatives to coffee, especially for small landholders.

D. Post Harvest Management Division
1. Personnel
   a. Division Head (Agricultural Engineer)
   b. Mech. Engr./Sub-products Mgmt. Specialists (2)
   c. Associates (2)
   d. Assistants (2)
   e. Secretaries (2)
2. Technical Assistance
   a. Post Harvest Mgmt Specialist (18 months)
   b. Short term as assigned by Director

3. Equipment: Experimental "beneficio", storage facilities and equipment for testing coffee by-products
Vehicles (Access to research pool)

4. Principal Activities
   a. Develop alternatives for the use and management of coffee wastes and by-products.
   b. Studies on the use and production of energy.
   c. Studies on coffee processing and storage.
   d. Studies on coffee quality and means of control and improvement.
   e. Studies on yields and transformation ratios at various stages of processing, according to varieties, seasons and treatments.

D. Analytic Services Division

1. Personnel
   a. Division Head (Chemist)
   b. Associates (5)
   d. Assistants (5)
   e. Secretaries (2)

2. Technical Assistance
   a. Short term as assigned by the Director

3. Equipment: Laboratories for the analysis of soils, water, chemicals and plant tissues. Automated testing equipment. Computer equipment.

4. Principal Activities
   a. Conduct routine soil, water, plant and chemical analyses to users.
   b. Provide special analyses of impurities, residuals and chemical contamination.
   c. Test and analyze coffee quality and characteristics.
   d. Support the research efforts of the various other divisions.
   e. Provide additional computer support to the foundation as necessary.

II. Communications and Training Directorate

A. Office of the Communications and Training Director

1. Personel
   a. Director
   b. Secretary

2. Technical Assistance--Assigned to the Divisions

3. Equipment: Office equipment, communications, etc.
Vehicles (Pool of 4 vehicles)

4. Principal Activities
   a. Plan, organize and coordinate all the communications and training activities of the foundation

b. Maintain close contact with researchers and direct the development of relevant extension programs for producers.
c. Insure that outreach activities are directed toward small and medium producers
d. Assist in development of an effective training program for PROCAFE staff

B. Training Division
1. Personel
a. Chief
b. Secretary
c. Associates (3)
d. Assistants (3)
2. Technical Assistance
a. Training Specialist (12 months)
b. Short term as necessary
3. Equipment: Office equipment, communications, etc.
Vehicles (Access to Division's pool)
4. Principal Activities
a. Provide effective training for PROCAFE staff and clients
b. Assist researchers and technology transfer agents in presenting effective training events
c. Assist in the scheduling and conduct of training events
d. Coordinate and cooperate with other domestic and international training groups in extending the benefits of the foundation's activities through training.
e. Establish and maintain a system of training evaluations and records

B. Technology Transfer Division
1. Personel
a. Chief
b. Education Specialists (2)
c. Regional Coordinator
d. Group Coordinator
e. Regional Office Leaders (3)
f. Group Leaders (3)
g. Tech Transfer Agents--Ing Ag (13)
h. Tech Transfer Agents--Peritos Ag (60)
i. Secretaries (7)
2. Technical Assistance
a. Tech Transfer Specialist--Credit (12 months)
b. Tech Transfer Specialist--Coops (12 months)
c. Extension Specialist (3 months)
d. Short term as necessary
3. Equipment: Office equipment, communications, farm tools, etc.
Vehicles (Pool of 47 vehicles)

4. Principal Activities
   a. Deliver appropriate technology to small and medium size coffee producers with the objective of promoting its adoption to increase yields and profits.
   b. Organize small and medium size producers into groups to facilitiate technology adoption.
   c. Work closely with all producers to discover their problems and constraints and effectively communicate these to researchers.
   d. Assist cooperatives in their development and operations
   e. Assist producers in obtaining access to production and investment credit for adoption of new technology

B. Communications Division
   1. Personel
      a. Chief
      b. Associates (2)
      c. Assistants (5)
      d. Secretary
   2. Technical Assistance
      a. Tech Communication Specialist (12 months)
      b. Short term as necessary
   3. Equipment: Office equipment, communications, audio-visual and publications equipment, etc.
      Vehicles (Access to Division's pool)
   4. Principal Activities
      a. Prepare education materials and assist in their production
      b. Prepare advertising and informational campaigns related to new technologies and the PROCAFE foundation
      c. Supervise the technical aspects of producing eduactional and training materials which have been contracted out for production
      d. Assist researchers and transfer agents in preparing effective educational and training materials
      e. Advise on the technical aspects of PROCAFE's public relation campaigns

As coffee technology is generated and/or validated by the Research Divisions, it is passed to the Technology Transfer and Communications Directorate to be disseminated among clients. Generally, the Training and Communications Divisions' personnel will assist the transfer agents in devising the most effective means and methods of disseminating the information. Technology transfer agents, either working through their groups of organized producers or through the Regional Offices, will pass the information on to producers and other clients. Any grower who wishes information can request it at a Regional Office or through his/her association. Small and medium size growers who are not

affiliated will be sought out through programs based in the the Regional Offices and served by the ACS technicians. (See Page 12.)

Other Institutions and Associations are also important to the proper development, transfer and adaptation of modern coffee production techniques, as well as to the general well being of the coffee industry. These organizations and their characteristics are summarized below:

The Salvadorean Coffee Council (CSC).

CSC is an autonomous governmental institute with a Board of Directors constituted by the government and represented by:

Minister of Economy
Minister of Agriculture and Cattle
Minister of the Treasury
President of the Central Bank

and by the private sector represented by a designate of:

Salvadorean Coffee Grower Association (ACS)
The Union of Coffee Growers Cooperation (UCAFES)
The Union of Agrarian Reform Cooperation that are producers, millers and coffee exporters (UCAPROBEX)
The Salvadorean Association of Coffee millers and Exporters (ABECAFE).

Its principal functions are to:

- Formulate and direct Salvadorean coffee policy.
- Assure the free market principle of coffee commence prevail in all national and international trading.
- Assure and participate in the rigorous fulfillment of all international coffee agreements.
- Oversee that sale prices are consonant with the international market for each quality.
- Cooperate with the government to establish that hard currencies generated by coffee exports are returned to the country and confirm that the government receives the correct amount of taxes.
- Collect, collate, interpret and publish all statistics pertaining to the coffee industry.

CSC is funded by a special assessment of US ($0.50) fifty cents per hundred weight of coffee exported. The CSC was decreed by law on October 30th, 1989, and the law became effective on November 8th, 1989.

Salvadorean Coffee Grower Association (ACS).

ACS is the oldest private sector association in the country it has a current membership of 5,000 and represents the interests of all coffee producers. (See page 12.) It is governed by a Board of Directors (BOD) elected by a general assembly of delegates.

The general assembly delegates are elected in democratic elections in the following proportion:

a) departments that produce less than 100,000 hundred weights of coffee - one delegate.
b) departments that produce between 100,000 to 500,0000 hundred weight - five delegates.
c) departments that have a production larger than 500,000 hundred weight - elect another delegate for every added 100,000 hundred weight or fraction.

Board members are elected for a two-year period and may be reelected. The directors are constituted and denominated as: President, three "vocales," secretary, prosecretary, treasurer, protreasurer and a trustee. They are nominated and elected to carry our these principal functions:

- Authorize and register coffee brands and other markings that distinguish coffee.
- Represent all Salvadorean Coffee Growers.
- Implement Coffee Defense Law of June 6th 1930, official gazette No. 127.

In the 1980s its functions were stripped by the Salvadorean government, but lately it has been trying to emerge as the vanguard of coffee growers.

ACS is funded by a farm granted in the early 1930s called El Carmen with a 31 manzana (22 Hectare, 54 acres) area. Today its urban development land borders Sta. Tecla. ACS also has certificates of deposit and bank bonds that have accumulated interest over the years to make it self-sufficient.

ACS was founded on December 18th, 1929, and opened its doors to all Salvadorean coffee growers in January 1930.

Union Coffee Growers Cooperatives (UCAFES).

UCAFES began as a union or trade federation of eleven (11) cooperatives in 1979 to strengthen cooperativism of private sector coffee growers. It now (1992) has 23 cooperatives as members collectively representing 5,500 growers.

UCAFES is a non-profit cooperative corporation owned through limited responsibility shares according to Salvadorean commercial law regulating all corporations.

The general assembly is represented by each member cooperation, independent of the members shares, and these delegates elect a board of directors.

UCAFES's principal objective is the social and economic improvement of its members.

UCAFES has the following functions:
1. Obtain local and international funds.
2. Provide credit to its member associations for coffee activities.
3. Represent and carry out commercial activities for the benefit of its associates to enhance earnings.
4. Provide all inputs to its associates at competitive prices.
5. Enhance coffee usage.
6. Maximize and augment cooperative education.

UCAFES is funded by share purchases and capitalizes off earnings produced by its financial activities.

It was founded on August 28th, 1979.

The Union of Agrarian Reform Cooperatives that are Producers, Millers and Coffee Producers (UCRAPROBEX).

UCRAPROBEX is a non-profit union of coffee agrarian reform cooperatives with a universe of 50 coffee related cooperatives representing a collective membership of 6,659. At the moment the union gives technical assistance to 33 cooperatives of which 24 cooperatives are members of UCRAPROBEX.

Its general assembly is constituted by its 24 member cooperatives and it elects a board of directors of seven (7) members for two-year periods who vote the positions of the board among themselves.

UCRAPROBEX's principal objectives are the social and economic improvement of its members. Its main functions are:
1. Obtain local and international funds.
2. Provide credit access to its member associations.
3. Fund and provide its members with appropriate technologies.
4. Advise, assist in milling and marketing coffee at the local and international scenario.

The union funds its coffers by charging a twelve colon ($12.00/qq) per hundred weight for marketing the coffee of its member cooperatives.

It was founded on September 24th, 1988, to represent all coffee agrarian reform cooperatives.

The Salvadorean Association of Coffee Millers and Exporter (ABECAFE).

ABECAFE is a non-profit organization that associates and represents the independent coffee millers and exporters of the country.

All Salvadorean millers and exporters are also coffee growers, although their principal activity is milling and exporting.

ABECAFE has a general assembly of all members that democratically elects a seven (7) member board of directors for one year which may be reelected.

The principal objectives are:

1. To serve as the spokesperson of the independent millers and enhance cooperation between corporations who are in the purchase, milling, sales and exporting of coffee.
2. To represent its members with National and International Coffee Organizations.
3. To assist and support all efforts that will lead to the recognition of El Salvador's high quality coffee.

It is funded by monthly quotas that are determined based on the volume of business that each miller conducts. These monthly quotas vary from one hundred to three thousand colones.

The Salvadorean Coffee Research Institute (ISIC).

ISIC was created by the GOES in December of 1955 as an autonomous legal scientific entity with its own assets and with the principal objectives of generating coffee technology to assist and improve the Salvadorean coffee industry.

Decree No. 903 of the Revolutionary Junta on December 22, 1981, annulled the previous law and buried the ISIC of 26 years. ISIC was again created by another decree on December 22, 1982, but divested of its extension services and put under the direction of the Ministry of Agriculture.

In 1987 with external assistance and to work with UCAFES, ISIC participated in the TTC, a credit and T.A. project to work UCAFES member cooperation.

ISIC still functioned as an institute within the Ministry of Agriculture until July 1991 when it was abolished by the Legislative Assembly and its responsibilities were replaced by PROCAFE.

ESTATUTOS DE LA "FUNDACION SALVADOREÑA PARA INVESTIGACIONES DEL CAFE"QUE PODRA LLAMARSE PROCAFE"

Art. 1.- NATURALEZA Y DENOMINACION.- La "FUNDACION SALVADOREÑA PARA INVESTIGACIONES DEL CAFE", es una Fundación de Utilidad Pública, no lucrativa, ni religiosa que podrá llamarse "LA FUNDACION" ó por las siglas "PROCAFE" y que se regirá por su Escritura de Constitución y los Estatutos.

Art. 2.- DOMICILIO.- El domicilio de la Fundación será la ciudad de San Salvador, pero podrá establecer Oficinas o Representaciones en cualquier otro lugar -- dentro o fuera del territorio nacional.

Art. 3.- PLAZO.- La Fundación se constituye por un plazo indefinido.

Art. 4.- OBJETO.- La Fundación tendrá como finalidades:

a) Proporcionar el desarrollo integral de la caficultura a través de las investigaciones y experimentos que fueren necesarios a fín de incrementar su producción, productividad y calidad; aplicando tales investigaciones y experimentaciones en buscar nuevos usos para el café y sus subproductos así como la industrialización del mismo.

b) Estimular a los productores y especialmente a los pequeños para que adopten la--tecnología moderna en sus propiedades cafeteras.

Para el cumplimiento de sus fines la Fundación desarrollará las siguientes actividades:

a) Efectuar las investigaciones y experimentos para perfeccionar los procedimientos de cultivo, beneficiado e industrialización del café;

b) Propiciará investigaciones y experimentos para preparar o elaborar los sub-productos que se obtengan del café;

[illegible]

cas sobre la producción nacional del café;

d) Dará asistencia técnica a los caficultores para el fomento del cultivo del café en forma más eficiente;

e) Propiciará la formación de técnicos especializados en las diversas actividades de la caficultura;

f) Realizará una amplia difusión de los resultados obtenidos en las investigaciones y trabajos experimentales realizados; se implementarán programas especiales de transferencia de Tecnología que respondan a las necesidades de los pequeños productores;

g) Mantendrá y promoverá relaciones con otras instituciones nacionales e internacionales, que persigan fines análogos a los de la Fundación;

h) Cualquier otra actividad relacionada con los fines para los cuales se ha -- creado la Fundación.

Art. 5.- PATRIMONIO.- El patrimonio de la Fundación estará constituído de la manera siguiente:

a) Un aporte inicial de TREINTA Y UN MIL QUINIENTOS COLONES EXACTOS que los -- miembros fundadores iniciales han pagado.

b) Los donativos o contribuciones en efectivo o en especie que reciba la Fundación.

c) Los ingresos que se obtengande las inversiones que realice la Fundación, - honorarios, publicaciones, seminarios u otras actividades, de acuerdo a -- sus objetivos y Estatutos.

d) Cualesquiera otros bienes, muebles o inmuebles, que se obtengan a cualquier título.

El patrimonio de la Fundación pertenece a la misma y en ningún caso a sus -- miembros y se destinará exclusivamente a la realización de sus objetivos. La [illegible]

instituciones o personas nacionales, extranjeras o internacionales, para el financiamiento de sus actividades, de conformidad con sus objetivos.

Art. 6.- DE LOS MIEMBROS DE LA FUNDACION.- La Fundación está compuesta por miembros de las siguientes categorías:

a) MIEMBROS FUNDADORES.- Son todos los productores, ya sean personas naturales o jurídicas, que han contribuído al fondo inicial con el cual se constituye la Fundación.

Además, serán miembros fundadores, aquellas personas naturales o jurídicas, que cancelen su respectiva Cuota de Ingreso que determinará la Junta General.

b) MIEMBROS ASOCIADOS.- Son empresas o personas naturales o jurídicas que se identifican con los objetivos de la Fundación y mediante aceptación de la Junta Directiva, aportan una cuota única o mensual o anual, fijada por la misma Junta.

c) MIEMBROS HONORARIOS. Son personas naturales, jurídicas o Instituciones a quienes la Junta General les concede esa categoría en atención a servicios relevantes prestados a la caficultura en El Salvador.-

Art. 7.- ADMINISTRACION DE LA FUNDACION.- La Administración de la Fundación estará confiada a la Junta General y a la Junta Directiva dentro de sus respectivas atribuciones.

Art. 8.- JUNTA GENERAL.- Las Juntas Generales, tanto ordinarias como extraordinarias, estarán formadas por la reunión de los miembros fundadores, legalmente convocada y constituída; sus acuerdos serán válidos a pesar de que el quórum se disminuyere en el curso de la sesión. Los miembros fundadores podrán hacerse

escrita dirigida a la Junta Directiva, no permitiéndose más de dos re-- presentaciones por persona.

Art. 9.- JUNTAS GENERALES ORDINARIAS O EXTRAORDINARIAS.- La Junta General Ordinaria se reunirá una vez por año o cuando lo acuerde la Junta Directiva. La Junta General Extraordinaria se reunirá en cualquier tiempo, cuando lo acuerde la Junta Directiva o cuando lo pidan por escrito con expresión de objetivo y motivo por lo menos veinticinco miembros fundadores que tengan por lo menos un año de ser miembros fundadores.

Art. 10.-CONVOCATORIA A JUNTA GENERAL.- Las convocatorias a Junta General Ordinaria o Extraordinaria serán ordenadas por la Junta Directiva, por medio de un aviso que se publicará en un periódico de mayor circulación, con quince días de anticipación por lo menos a la fecha de la sesión, no contándose para -- computar este plazo el día de la publicación del aviso, ni el día de la celebración de la sesión.

En caso de estar presente la totalidad de los miembros que forman la Junta General de la Fundación, podrá sesionarse sinconvocatoria, previa aproba-- ción unánime de la Agenda.

Art. 11.-QUORUM PARA REUNIONES DE LA JUNTA GENERAL ORDINARIA A LA PRIMERA CONVOCATORIA.- Para que en la primera convocatoria haya quórum para instalar la Junta General Ordinaria, se necesitará la asistencia por si o por representación - del cincuenta por ciento más uno del total de los miembros fundadores de la Fundación.

Art.12.- QUORUM PARA LA JUNTA GENERAL ORDINARIA EN SEGUNDA CONVOCATORIA.- Si la Junta General no hubiere [illegible]

convocará por segunda vez para una hora más tarde llenándose las mismas formalidades que para la primera y la Junta General se verificará con cualquiera que sea el número de miembros presentes o representados que asistan.- En el mismo aviso se podrá hacer la primera y la segunda convocatoria.

Art. 13.- MAYORIA PARA RESOLVER EN LAS JUNTAS GENERALES.- Las resoluciones de la Junta General, salvo los casos expresados por estos Estatutos, se tomarán con el voto de la mitad más uno de los miembros presentes o representados en la sesión y serán obligatorios para todos sus miembros.-

Art. 14.- ATRIBUCIONES DE LA JUNTA GENERAL ORDINARIA.- La Junta General Ordinaria tendrá entre otras atribuciones las siguientes:

a) Elegir a los miembros honorarios;

b) Aprobar o improbar los actos de la Junta Directiva, su Memoria Anual, y los Estados Financieros de la Fundación;

c) Elegir a los miembros de la Junta Directiva de entre las nóminas que respectivamente le presenten, Abecafe, Ucraprobex, Ucafes y Asociación Cafetalera de El Salvador;

d) Elegir al Auditor de la Fundación y señalar su remuneración;

e) Aprobar o reformar el presupuesto de gastos que le presentará la Junta Directiva;

f) Analizar y resolver cualquier asunto de interés para la Fundación que no esté previsto en estos Estatutos.

rt. 15.- ACUERDOS QUE SOLO PODRAN TOMARSE EN JUNTA GENERAL EXTRAORDINARIA Y CON COMPUTO DE VOTACION ESPECIAL.- Solamente en Junta General Extraordinaria convocada al efecto y con el voto de por lo menos las tres cuartas partes de los mem-

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a) La modificación de estos Estatutos;

b) La fusión con otras entidades; y

c) La disolución de la Fundación .

Todos estos acuerdos surtirán efectos al ser aprobados por el Organo Ejecutivo en el Ramo del Interior y publicados en el Diario Oficial. Si no hubiere quórum de las tres cuartas partes de los miembros fundadores de la Fundación por lo menos, se podrá hacer una segunda convocatoria, en aviso separado y por lo menos quince días después de la primera.

En la sesión que se celebre mediante segunda convocatoria, las resoluciones se tomarán con los votos de las tres cuartas partes de los miembros fundadores que asistan, siempre que el quórum sea por lo menos de la mitad más uno del total de miembros fundadores de la Fundación.

Art. 16.- LIBRO DE ACTAS DE LAS SESIONES DE JUNTA GENERAL.- Lo resuelto en las sesiones de Junta General se asentará en un libro de actas. Las Actas estarán firmadas por el Presidente y el Secretario de esa Junta General, electos por mayoría de votos de los asistentes y representados. Como anexo deberá agregarse el Acta de quórum, firmada por todos los asistentes a la sesión de Junta General.- El Libro de Actas de sesiones de la Junta General estará confiado a la guarda y cuidado del Secretario de la Junta Directiva.-

Art. 17.- DE LA JUNTA DIRECTIVA.- La Administración de la Fundación en lo que no corresponda a la Junta General, estará confiada a una Junta Directiva compuesta de ocho Directores Propietarios, propuestos, dos por cada una de las siguientes gremiales: Abecafé, Ucraprobex, Ucafes y Asociación Cafetalera de El Salvador.-

Los miembros de la Junta Directiva se distribuirán entre sí, por la mayo-

sidente, Secretario, Pro-Secretario, Tesorero, Pro-Tesorero, Vocal y Síndico. La Junta Directiva podrá encomendar funciones específicas a cualquiera de sus miembros o integrar comisiones formadas o presididas por ellos.-

Art.18.-REQUISITOS PARA SER DIRECTOR, PERIODO DE SU EJERCICIO Y SU REELECCION. Para ser miembro de la Junta Directiva de la Fundación es necesario ser miembro fundador de la misma y haberlo sido en los dos años anteriores.-

Los miembros de la Junta Directiva durarán en sus funciones 3 años, pudiendo ser reelectos por un nuevo período; al terminar este segundo período, no podrá optar a ningún cargo de la Junta Directiva, sino hasta después de haber ocurrido una elección.-

En caso de que por cualquier circunstancia transcurriere el período para el cual fueren electos los miembros de la Junta Directiva, sin que se hubiere hecho la nueva elección, los que estén fungiendo como tales continuarán en funciones hasta que los nuevos tomen posesión de sus cargos.-

Art.19.-QUORUM DE LA JUNTA DIRECTIVA Y MAYORIA PARA RESOLVER.- La Junta Directiva se tendrá por legalmente reunida y sus decisiones serán válidas con la asistencia de por lo menos la mitad más uno de sus miembros.- Las resoluciones requerirán el acuerdo de por lo menos la mitad más uno de los asistentes. En caso de empate, el Presidente o quien haga sus veces decidirá con voto de calidad.-

Art.20.-SESION DE LA JUNTA DIRECTIVA Y CONVOCATORIA.- La Junta Directiva sesionará ordinariamente por lo menos una vez al mes y extraordinariamente cuando sea convocada al efecto. La convocatoria a sesión de Junta Directiva la hará el Presidente o por lo menos tres de sus Directores.-

Art.21.-ATRIBUCIONES DE LA JUNTA DIRECTIVA.- La Junta Directiva tendrá especialmente

Diecisiete de sus Estatutos;

b) Nombrar y remover al Gerente General de la Fundación;

c) Invitar a nuevos miembros fundadores, y asociados, aceptar su ingreso y determinar el monto de las contribuciones de estos últimos;

d) Administrar el patrimonio de la Fundación;

e) Autorizar al Presidente o cualquier otro Director o funcionario de la Fundación para la celebración de los contratos que se relacionen con los objetivos de la Fundación, ya sea específicamente para cada caso o de manera general;

f) Elaborar en cada Ejercicio los Estados Financieros de la Fundación para presentarlos a la Junta General para su aprobación;

g) Elaborar una Memoria Anual de actividades;

h) Convocar a las sesiones de Junta General;

i) Recibir y aceptar las renuncias de los miembros de la Junta Directiva;

j) Cualquier otra que no fuere de la competencia de la Junta General.-

Art.22.- ACTAS DE LAS SESIONES DE LA JUNTA DIRECTIVA.- Lo resuelto en las sesiones de la Junta Directiva se asentarán en el Libro de Actas de la Junta Directiva de la Fundación y lo firmarán los Directores que hayan asistido a la sesión.-

Art. 23.-REPRESENTACION LEGAL Y ATRIBUCIONES DEL PRESIDENTE.- Corresponderá al Presidente o quien haga sus veces, representar a la Fundación, judicial y extrajudicialmente, previo acuerdo de la Junta Directiva, podrá contraer toda clase de obligaciones y otorgar toda clase de Escrituras Públicas o Privadas, poderes generales o especiales, enajenar o gravar los bienes muebles, valores o derechos de la Fundación; adquirir toda clase de bienes, conferir y revocar en su caso los respectivos poderes de administración [illegible]

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Junta Directiva puede dar dichas autorizaciones de manera general o para casos especiales. También corresponderá al Presidente o a quien haga sus veces, presidir las sesiones de la Junta General y de la Junta Directiva.

Art. 24.- SUSTITUCION TEMPORAL DE LOS MIEMBROS DE LA JUNTA DIRECTIVA.- En caso de ausencia o impedimento temporal de cualquiera de los Directores, la Junta Directiva elegirá para que lo supla a cualquiera de los Directivos,mien-- tras dure la ausencia o impedimento.

Art. 25.- MODO DE PROVEER A LA VACANTE DEFINITIVA DE LOS MIEMBROS DE LA JUNTA DIRECTIVA.- En caso de muerte, renuncia o impedimento permanente del Presidente, pasará a ejercer el cargo, el Vice-Presidente y a falta del mismo, el Di-- rector que acuerde la Junta Directiva, por todo el tiempo que faltare por concluir el ejercicio del titular. Si la vacante fuere de cualquier otro Director, la gremial a la cual pertenecía el ausente nombrará al sustituto por el resto del período.

De todo ello se dejará constancia en el Libro de Actas de sesiones de la - Junta Directiva.-

Art. 26.- ADMINISTRACION DIRECTA DE LA FUNDACION.- La Administración directa de la - Fundación estará confiada a un Gerente General, quien será el principal -- funcionario administrativo de la Fundación.- Será nombrado por la Junta -- Directiva quien será su superior directo. Corresponden al Gerente General las funciones administrativas de la institución, en todo lo que no esté - reservado a la Junta Directiva o a otros órganos de la misma.-

Art. 27.- AUDITORIA.- La Junta General Ordinaria elegirá a un Auditor, quien tendrá las siguientes obligaciones:

a) Examinar y certificar los Estados Financieros.

b) Inspeccionar con la frecuencia necesaria, los libros y documentos

Fundación.

c) Vigilar en lo general las operaciones de la Fundación y dar cuenta a la Junta General de las observaciones, de las irregularidades que constatare.

d) Asistir a las sesiones de Junta General.

Art.28.-EJERCICIO FISCAL.- El ejercicio fiscal de la Fundación será del uno de octubre al treinta de septiembre de cada año, o el que acuerde la Junta Directiva.

Art.29.-DISOLUCION DE LA FUNDACION.- Además de las causas legales, solamente se podrá disolver la Fundación, por acuerdo de la Junta General Extraordinaria, según el Artículo Quince de estos Estatutos y la aprobación del Organo Ejecutivo en el Ramo del Interior. En todo caso en que la Fundación se disuelva, hecha la liquidación, el remanente del patrimonio si lo hubiere, se destinará a las -- instituciones con objetivos similares a los de la Fundación, o se donará a -- las instituciones que la Junta General acuerde.-

Art.30.-OBLIGACION DE INFORMAR AL MINISTERIO DEL INTERIOR.-La Junta Directiva tiene la obligación de enviar en los primeros días del mes de enero de cada año, al Ministerio del Interior la nómina de miembros de la Fundación y dentro de los - cinco días después de electa la nueva Junta Directiva, una certificación en - el papel sellado correspondiente, del acta de elección de la misma, y en todo caso, proporcionar al expresado Ministerio, cualquier dato que se le pidiere relativo a la Fundación así como de cumplir con todos los requisitos que establezcan las Leyes de la República.

Art.31.-Los presentes Estatutos entrarán en vigencia desde el día de su publicación - en el Diario Oficial.-

por la Junta Directiva provisional a más tardar treinta días después de que estos Estatutos hayan sido legalmente aprobados.-

Art. 33.- La Fundación tendrá un Consejo Consultivo cuyo número de miembros y atribuciones serán determinados en el correspondiente Reglamento.-

Art. 34.- Son miembros fundadores iniciales de la Fundación las personas que firmaron el Acta Constitutiva y aportaron el patrimonio inicial de la Fundación "Señores: Narciso Mejía, Juan Héctor Scaffini, Ana Marina Zelaya, Adilia de Pullinger, Mabel Gotuzzo Bustamante, Marta Josefina Zelaya de Benedetto, Jaime Rivas Aberle, Rodrigo Bennedetto Zelaya, Luis Roberto Hidalgo, José Infantozzi, Rafael Schutz, Francisco José Guerrero, José Ricardo Molina Munguía, Gregorio Salomón Zelaya, Mario Valiente, José Carlos Larios, Francisco Daboub Yúdice, Mauricio Castro, Rolando Palacios, María Elena Avendaño de González, Ernesto Milla Nuila, René Mauricio Vidaurre, Mario Molina Vides, Mario Molina Batlle, Angel Molina Batlle, Tomás Cornejo, Ricardo Archer, Dymas Funes Hartmann, Elsa Luz de Méndez, Julia Victoria de Philipsen, Xenia de Ulloa, José Antonio Munguía, Ciro Hildebrando Umaña, Oscar Antonio Guevara, Armando Salazar Urrutia, Carlos A. Selva, Juan Duch, Eduardo Enrique Barrientos, Ricardo Bolaños Orellana, Marco Antonio Batres, Manuel Laínez Méndez, Pedro Jaime Ginjaume, José Augusto Ramírez Castillo, Ana - Elizabeth Zelaya, Mario Torres Flores, Rafael Guillén Urrutia, Pablo Anliker Palomo, Rodolfo Borjas Munguía, Eduardo Recinos Argüello, Baltazar Ferreiro, Rogelio Escobar Alas, Adolfo Menéndez Bolaños, Jorge Adalberto -- Atilio Arriaza, Enzo Giammattei Risso, Carlos Ernesto magaña Romero, Roger Bartolomé Cortéz Núñez, Luis Alfonso Morán Mancía, Roberto Machón, José -- Rubén Polanco Calderón, Carlos Ernesto Magaña Romero, Estela Beltrán de -- Centeno, Andrés Centeno/ Díaz, Mauricio Cáceres Rivera. Sociedad Agrícola El [illegible]

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DE C.V., Ricardo Orlando Valdivieso Oriani, Francisco Acosta Herrera, Ana Margarita Vega Lara de Molina, Ismael Sánchez Toledo, Guillermo Villatoro Hunter, Dimas Humberto Pocasangre, José Rutilio Ortíz, José Alfonso Jurado, Julio César Hernández, Tránsito Amed Castaneda, Emilio Antonio Beltrán Paz, Pedro Antonio Morán Galán, Alfredo Albanez Guardado, José Antonio Paraza, Virginia -- Vásquez Murcia, Raúl Bernardino Olmedo Escobar, Rafael Fernando Trabanino, Federico Pacas Díaz, Marina López de Pacas, Ricardo Avilés Alvarez, Arnoldo Ruffatti Paz, COPRA DE R.L., Carlos Adolfo Pineda Salazar, Lucio Constantino -- Araujo Rodríguez, Joaquín Sánchez Pérez, Jorge Edmundo López Padilla, Noé Rodríguez Deras, Mario Ernesto Alvarado, Ernesto Palomo Alcaine, José David López, José Rafael Vélez, Salvador Orlando Flores Alfaro, Mauro Rogelio Clímaco Rodríguez, José Omar Flores Hidalgo, Ricardo Andrés Iglesias Martínez, Modesto López, Luis Roberto Prieto Pérez, Maximiliano Edmundo Menjívar, Max Federico Menjívar, Napoleón Prieto, Manuel Gómez Alfaro, José Erasmo Argueta, Augusto César Romero Cuéllar, José María Sánchez Mendoza, Alex Antonio Panamá Barahora, Néstor Efraín Cáceres Morán, Jorge Osberto Hidalgo Aguirre, Oscar Joa-- quín Linares Cáceres, Pedro José Canana Iglesias, Roberto Buiza Calderón, Rafael Antonio Pozas, José Ricardo Góchez, Roberto Angel Castro, Ricardo Mariano Aguirre Morán, José Francisco Mata Avelino, Elisa América Jurado Cardona, Louis Agustín Calderón, José Augusto Ramírez, Gustavo Magaña, Miguel Jacinto Osegueda, Jaime Mauricio Salazar, Sociedad Cooperativa Ahuasanta de R.L., René Enrique Halimbourg, Francisco Girón Batres, Cooperativa de La Reforma A-- graria Santa Adelaida de R.L., Ernesto Arturo Sol Trujillo, Salvador Roberto Portillo Pineda, Manuel Gutiérrez Ruíz, Rafael Telles Mata, José Edgardo Mejía, Baltazar Dueñas Rivera, Vanderbilt R. Spader, Mónica C. Spader, Sociedad Cooperativa de Caficultores de Berlín, Marta Cecilia Castro, José Ficel Salgado, Luis Vásquez, María Consuelo Pacheco, [illegible]

Adolfo Ríos Robrero, Manuel Alberto Gomar Morán, Alfredo Salinas Morán, José René Beltrán, Salvador Roberto Portillo, Cooperativa Cafetalera de La Reforma Agraria "PINOS" Municipio El Congo, San Ana, Asociación Cooperativa Florencia de R.L., Víctor Elinor Quiñónez Quezada, Victoria Dalton de Díaz, Luis -- García Prieto, Oscar Armando Gutiérrez, Cayetano Betaglio, Armando Betaglio, Eugenia Armida Umaña Matta, Noé Rodríguez Deras, Francisco Javier Figueroa, Santos Fernando González, Rhina Luisa Urrutia Méndez de Carballo, Ana Graciela Cortez de Urrutia, Julio César Díaz Cañas, Héctor Luis Gutiérrez, Blanca Marina Machuca Viuda de Martínez, Ana Alicia Portillo de Gutiérrez, Luisa -- Argüello de Balibrera, Carlos Escalón Alvarez, Roselia Ursula Martínez Viuda de Iglesias, Cooperativa de La Reforma Agraria "Las Quebradas", María Evelis Rivas de Betaglio, Keith Dalton Lima, Roberto Trujillo Schleusz, José Armando Gordito, Miguel Angel Canjura, Juan de Dios Canjura, Justiniano Marcial-Parada Rivera, Luis Méndez Novoa, Camilo de Jesús Villeda Moya, Asociación - Cooperativa de La Reforma Agraria "Agua Fría", Cooperativa de La Reforma A-- graria "Las Cruces" de R.L., José Víctor Gómez Navas, Cooperativa de La Re-- forma Agraria "El Pinal" de R.L., Jesús Ardón de Castro, Asociación Cooperativa de La Reforma Agraria "El Salto", Joaquín Cosme Aguilar, César Augusto Rivas, Ricardo Gutiérrez Perdomo, Manuel Elías Quinteros, Fabio Bautista Pérez, ACRAP DE R.L., Cooperativa de La Reforma Agraria "Santa Marta Las Trincheras" de R.L., Adriano Vilanova, Rubén Ernesto Pineda, José Antonio Salaverría, Esperanza Monterrosa de Fuentes Perla, Asociación Cooperativa de La Reforma Agraria "El Jabalí", Tomás Vilanova Mayorga, José Gabriel García Ramírez, Elsa Isabel Flores de Zelaya, René Victoriano Ulloa, Marta Alicia Espinoza, Alba Luz de Espinoza, Rodolfo Edgardo Gómez Villalobos, Luis Rodolfo - Silva,Juanita de Silva, Jorge Alberto Dimas Pacheco, Ana Margarita Espinoza de Laínez, Humberto Antonio Espinoza, Rodrigo Hermógenes Mayén Cárcamo, ---

Luis René Cáceres A. , Evelia del Carmen Araniva, "La Isabel", S.A. DE C.V., Laura Rodríguez Campos, Nohemy de Urrutia, Jesús Galileo Urrutia, Adán Rivera Novoa, Cooperativa de La Reforma Agraria "Las Colinas", Carlos Antonio Boza Luis Alfredo Rodríguez, Cooperativa de La Reforma Agraria "Entre Ríos" de R.L., Alfredo Antonio Mena Lagos, Alfredo Antonio Mena Avilés, Jorge Roberto Mena -- avilés, Rubén Ovidio Beltrán, Antonio Cabrales, Rodolfo Ruffatti, Roberto Delgado. Sergio Catani, Antonio Borgonovo Avila, Filadelfo Leopoldo Baires, Antonio Arévalo, Orlando Caballero Amaya, Roxana Peccorinni de Hurtado, German Boillat, Mauricio Valdivieso Oriani, Julia Dolores Novoa de Pacas, María Alicia -- Morataya de Steiner, Mauricio Ruffatti, Javier Francés, Sociedad Zelaya Zelaya Hermanos, S.A. de C.V., Ena Mercedes Zelaya, Rafael Ernesto Barrientos Zepeda, María Alicia Interiano de Barrientos, Irma Astrid Valle, Henry García Prieto".-

ANNEX F

SOCIAL CONSIDERATIONS

1. INTRODUCTION

The major social objectives of the coffee project are: 1) to have a direct technological impact on 15,000 coffee producers, 2) to increase incomes, and 3) to promote the development of producer organizations. Achieving these objectives will require a major reorientation by a new PROCAFE to provide research and technical transfer capabilities for small farmers. Small coffee producers are located on lower altitude lands less appropriate for coffee; their production conditions will need to become a major focus if information relevant to small farmers is to be generated.

The potential for positive social impact of the project is significant. Coffee's position as the major export crop and a major source of government revenues guarantees that a successful reactivation of the coffee sector will have a broad positive effect on the national economy. The coffee industry is a major employer of unskilled labor in the country and is a crop readily managed by small farmers. Women will be direct beneficiaries from coffee improvement in view of their active participation in all phases of coffee production. PROCAFE can have an important role in assuring that the development and adoption of new coffee technology contributes in a way which is most conducive to the desired social outcomes.

The coffee project also carries a potential for negative social impacts. If PROCAFE directs its activities to enhance the productivity of the non-poor producers, its impact will put small producers at a comparative disadvantage and increase income disparities. Similarly, if the technical transfer process is based on technologies designed for different production conditions from those of small producers, an aggressive technical transfer policy can shift poor farmers into inappropriate and economically detrimental production strategies.

Currently, several institutional factors tend to exclude small farmers from improved techniques. The tradition of coffee research in El Salvador has focused more on the production conditions of the wealthy minority. A number of convincing rationales explain this bias, such as economic or technical efficiency, but the result is the exclusion of poor coffee farmer problems from the research agenda. This tendency is closely related to what might be described as the "career path" of coffee professionals; since long-term career opportunities lie in employment as technicians for large scale coffee production operations, technicians in the public sector find it in their interest to focus their professional activities to the extent possible in preparation for that eventuality. Thus, for progress in addressing small farmer

concerns within a new institutional structure for PROCAFE, this pattern of bias must be eliminated.

Present conditions are favorable for reorientating coffee research policy. According to the coffee processor's association, current low levels of coffee production are due to an artificial price structure imposed by the government on the coffee sector which lowers incomes and discourages reinvestment[1]. Title insecurity inspired by the agrarian reform also contributed to low levels of investment in coffee. As a result, coffee production has fallen to alarmingly low levels. However, both conditions are currently being alleviated through changes in tax laws and the Arena administration's perspectives on agrarian reform. Coffee production can be expected to rebound with minimal new technology once normal capital flows are reestablished.

With expected increases in coffee production, PROCAFE will have more latitude to concentrate on small coffee growers' problems. A research focus on small farmers inevitably has higher social than economic returns, since the poor ecological conditions, low levels of credit available, lack of technical assistance, small farm size and educational deficiencies all contribute to low absolute levels of production at a national level. At the same time, modest increases in productivity for these farmers will have significant impacts on their incomes. The growth of national coffee income as a result of the changing political climate will relax the need for research to improve production capacity in the short-term.

Several problem areas will influence project goals: 1) technological bias, 2) lack of organizational representation among farmers, 3) credit overload on adopters of new technology, and 4) the traditional tendency to overlook women as producers.

2. TECHNOLOGICAL BIAS

Technological bias will be a central concern in the implementation of a research program with the desired social impact. Poor coffee farmers tend to have production systems with very different characteristics from those of wealthier producers. Because of this differentiation in techniques, many of the current high yield production models for coffee may bring short-term financial problems for small farms. A brief consideration of the technological differences and motivations, suggest research priorities which should be incorporated into the PROCAFE strategy.

The most significant characteristic of small holder coffee production is the use of fruit trees for shade instead of the Inga varieties recommended by ISIC. Several factors explain this tendency, which is especially pronounced in areas of "Bajio" (below 800m) where 61% of the national coffee land is located[2]. Fruit sales may equal the value of coffee in some parcels, so farmers are understandably cautious about eliminating fruit trees in favor of

the recommended technology. However, it should not be assumed that the inclusion of fruit trees is merely a "tradition" whose use can be eliminated by demonstrating the relative incomes of mixed coffee-fruit and pure coffee plantations.

Some farmers have made significant attempts to improve the mixed cropping pattern, experimenting with different species and varieties of fruit trees. Musaceae (guineos) were the most common fruit associated with coffee, along with mango, oranges, avocadoes, etc. In recent years there has been a shift to eliminate fruits other than guineo and oranges, and there may be a growing preference for oranges. Producers explained that there is such a strong market for oranges that truckers will purchase fruit still on the tree and harvest it. The loss of interest in tall fruit trees is due to a concern with falling fruit damaging coffee plants. Searching for better markets, some producers are introducing improved orange varieties into their mixed plantations.

From the perspective of a small producer, the coffee-fruit combination is less risky than pure coffee because income is more diversified. For poor families, food crops always enjoy a certain priority as a way to guarantee family nutrition over unpredictable markets. An increase in market prices for fruit (as farmers report in recent years) is both an opportunity and a threat for poor farmers, since it offers both increased sales and increased food costs if the farmer must purchase fruit. Formerly abundant local fruits disappear or take on higher prices in local markets as they are drawn into national markets, adding another incentive to the maintenance of the fruit-coffee combination.

Fruit production may also reduce scheduling conflicts, thereby allowing small farmers to participate in the labor market. Because most of the nation's farms are too small to support a family with its own resources, day labor is an important source of supplementary income. Recent data indicate that 61% of all farmers work off-farm, and of these, 84% work in agriculture[3]. Several farmers noted with satisfaction that orange production occurs throughout the year with three production peaks. They found the relatively even distribution of income throughout the year an improvement over coffee's concentrated harvest period. In addition, labor inputs for fruit production do not necessarily coincide with those of coffee.

The management requirements for fruit are less demanding than for coffee and also do not coincide with major periods of labor demand in coffee. Such scheduling eases labor problems on the small farm and permits the farmer to work more freely in off-farm coffee activities, a major source of part-time agricultural wages. Generally, small farms do not produce enough for a family's livelihood. Thus, farmers maximize their income by minimizing time conflicts with outside laboring. Of course, the exception to this generalization are "professional" coffee growers who have full-time jobs producing the bulk of their income. Under this circumstance, producers prefer a concentrated pattern of labor demands to

minimize managerial problems. The pattern of more frequent small jobs (coming from a mixed production strategy) would be undesirable for the "professional" cafetalero.

In sum, unless farms are of sufficient size or until coffee trees begin producing enough, farmers are likely to manage the farm in a way to supplement off-farm income while not interfering with off-farm labor.

The significance of this pattern for PROCAFE is clear. The research needs of very small coffee farmers will involve 1) improved methods for producing coffee among a variety of crops and 2) management strategies to improve overall economic performance but not demand disruptive labor inputs. Research areas of interest might be patterns of fertilization, management techniques for inter-mixed crops, testing of varieties for compatibility with fruit associations, and techniques for distributing cultural practices and harvest during slack labor periods. The long-term goal is to move farmers from current to high production coffee management practices in a steplike fashion synchronized with their gradual shift toward increased income self-sufficiency from their own farms.

2.1 Cost and Efficiency Considerations for Small Farm Production

A major argument against supporting small farm coffee production is that it represents a social service with little economic return to the nation. Both researchers and extensionists cite low levels of productivity and high costs traditionally associated with the small farm sector. The clearest evidence for this pattern is the comparison of national production statistics. The bajio area where small coffee producers are concentrated represents 61% of all national land in coffee (see Table 1). Nevertheless, a relatively greater amount of coffee production is reported from the medium and high altitudes, resulting in average production figures for the lower regions which are only 50% of the higher regions.

However, as data are reviewed, doubts arise about these conclusions. The evidence for low efficiency of low income coffee producers is not entirely convincing based on available data. If production figures are broken down by altitude, size and technical level, size does not have a determining effect on productivity or per unit production cost (Garza n.d.). Nevertheless, further information is needed to distinguish poor from affluent small coffee farmers; many farms are owned by urban professionals whose access to capital and short-term cash needs could differentiate their management possibilities and technical responses from those of poor small farmers.

Similarly, the evidence for inefficiency of production in the bajio altitudes is also mixed. A comparison of costs of production per quintal stratified by geographical region, altitudinal zone and size of farm shows that in only 6 of 16 categories is the production cost per quintal higher in the bajio. (See Table 3.)

Although indirect evidence suggests extremely low productivity and efficiency of farms in small farmer areas, a segregation of data into components suggests that this conventional view is exaggerated. Moreover, because of price differentials between coffees produced at different altitudes, there is a tendency to under-report low altitude coffees and reclassify them as high altitude coffees. While evidence suggests that investments in small farm coffee production may be less efficient technically and economically, this evidence is not entirely clear and statistical errors almost certainly exaggerate this inefficiency.

3. <u>Lack of Organizational Representation for the Majority of the Target Population</u>

The beneficiary population of the coffee project has been defined as the 27,000 farmers managing less than 5 ha of coffee. In addition, the proposed technology transfer mechanism promises to reach as many as 14,000 coffee-producing agrarian reform beneficiaries. Indirectly and of less concern for project objectives, the improvement of coffee technology and technology transfer will benefit some 8,000 medium and large scale coffee producers for a total beneficiary population of almost 50,000 farmers. However, the impact may be limited by the exclusion of a large portion of the target population from producers' associations specified by the project paper as vehicles for technology transfer.

The project identification document identifies primary three avenues for technology diffusion: the UCAFES association of coffee cooperatives, the UCRAPROBEX association of coffee-producing agrarian reform cooperatives, and ACS members. Technology will be distributed to any producer requesting assistance and through ABECAFE, the organization of processors and exporters. Importantly, PROMECAFE technicians will actively try to reach small, unaffiliated producers through group techniques such as PROMECAFE's "Grupos de Amistad and Trabajo."

The Grupos de Amistad y Trabajo (GAT) were the product of an ISIC-PROMECAFE project in the early 1980s. This project sought to stimulate and support locally based groups which could serve as conduits for technology change. Unfortunately, this project was dispersed as a result of successive reorganizations of ISIC and the reassignment of personnel[5]. Several publications resulted, documenting technological alternatives and making recommendations for research and transfer (ISIC-PROMECAFE-IICA-AID 1984). The model developed was adopted later by other organizations as mentioned below. However, for the purposes of this project, the Grupos may serve as a model for the unaffiliated producers.

The remaining three avenues of technical support include only a small part of the identified target population (See Table 4). The population covered by UCRAPROBEX is the largest and potentially represents all coffee producing reform cooperatives; various estimates exist between 101 and 110 cooperatives with a population of 14,000 to 29,000. The variations apparently derive from the

definition of the coffee producing cooperatives; a number of cooperatives have a small amount of coffee, either absolutely or relative to the total cooperative operations and may or may not be included depending on the source of information (see Annex 1). At present, UCRAPROBEX counts 25 cooperatives as affiliates with 22,803 individual members and is expecting to continue expanding its numbers (see Annex 2). Expected growth does not seem unreasonable, since UCRAPROBEX was only established in the last two years.

Currently the organization is financed through a 12 colon/quintal levee on the coffee it markets for the member cooperatives, of which nearly half has been returned to cooperatives as dividends when income exceeded operational expenses. UCRAPROBEX currently facilitates loans to member cooperatives from Central Bank funds (at no charge) and is a channel for technology transfer activities financed through the Central Bank. While the group provides training to members, it has focused mainly on marketing and cooperative management. It is currently participating in a project for technical improvement in the cooperative San Isidro with Technoserve, financed through the BFA with the support of the A.I.D.-financed Project 307 credit line.

While servicing a smaller population (approximately 4,400 members, 1,934 of which are small and medium producers), UCAFES currently has an organization which closely parallels the technology transfer needs of PROCAFE. In coordination with the AID-UCAFES-ISIC Technology Transfer for Coffee Project, UCAFES built up a staff of 12 extensionists. Nine of these extensionists work mostly in general extension activities, including both technical consultation with farmers (more than 1300 individual extension contacts for June 1990) and periodic presentations and demonstrations in the cooperatives (82 in June).

UCAFES's cooperatives are also implementing the Grupos de Amistad y Trabajo methodology pioneered in ISIC. Many of the UCAFES technicians are former ISIC employees trained in that methodology, and the small farmer component of the UCAFES cooperatives requires special outreach techniques. This approach deserves attention, especially in view of its ability to reach the project target population.

The existence of non-UCAFES, non-UCRAPROBEX cooperatives seem to be a result of the legal structure of cooperatives in El Salvador, rather than characteristics of their members or production methods. At least one of these cooperatives (the total number of such cooperatives is uncertain) has attempted to join with UCAFES, only to find that its charter is drawn up under a different and incompatible set of legal statutes.

While the total population potentially covered by these three sets of organizations is impressive, it leaves a large segment of the population without access to technical assistance as contemplated in the coffee project. Moreover, it is likely that the farmers

unrepresented are in fact the poorest and most in need of assistance; members of the existing groups have already been beneficiaries of cooperative activities or agrarian reform. Special efforts will be made to draw in what are likely to be the most disadvantaged of the small coffee farmers.

4. SOCIAL IMPACT CONCERNS IN TECHNOLOGY TRANSFER

The process of technical transfer will be a major factor in the social impact of the coffee project. Small producers face special problems in the adoption of new technology in addition to the aforementioned characteristics of their farms. Three characteristics suggest areas of concern in the design of the technical transfer process: 1) Even among land owners the rate of functional illiteracy is 82%. 2) Of great importance for the sustainability of the technical transfer process, small farm technical transfer carries few career rewards for change agents; the retention of trained transfer agents will be an ongoing task of the project. 3) Small farm sizes and low incomes make small producers especially sensitive to cash flow problems.

4.1 Technology Transfer Problems for Small Farmers

McReynolds et.al. (1989) found 82% of farm owners were functionally illiterate, as were 90% of farm laborers[6]. Efforts at technical transfer must be designed to rely little on written technical recommendations and more on graphic methods.

The design of technology transfer materials and their use will be important to the project. While a great variety of alternative methods exist, extension agents have relatively little experience in their use. The design of graphic presentations, the use of video materials to be projected in local "movie" houses, and the use of slide presentations are options to be evaluated.

The Grupos de Amistad y Trabajo mentioned above deserve attention in this context, since their methodology is especially relevant. GAT procedure is based on the identification of demonstration plots and meetings of farmers at the demonstration site for training and explanation of specific activities. The use of "paratécnicos" to manage these demonstrations provides an opportunity for technical transfer in small groups to facilitate learning.

4.2 Career Rewards for Technical Transfer Personnel

Most of the several hundred peritos agrónomos and ingeniero agrónomos of El Salvador are employed in the private sector. The private sector provides technicians with the best opportunity for reasonable income and job stability. Therefore, the coffee project must design a career path for technology transfer personnel which provides sufficient motivation to remain in that activity even after attaining a marketable level of competence.

Technology transfer agents must be provided with good salaries and job security. Otherwise, the likelihood and desirability of eventual employment in the private sector hinders the continuity of technology transfer efforts to small farmers. Technicians are ever alert to opportunities to impress large coffee growers who are potential future employers. In fact, the history of instability of ISIC employment over the past decade has made this strategy one of survival rather merely personal ambition. As long as employment in technology transfer to small farmers is perceived as low paying, unstable employment, the need to cultivate large farmers will remain.

Similarly, paths for career advancement among technology transfer personnel must exist within the area of assistance to small farmers. These paths need not be exclusively within either PROCAFE or the public sector; the creation of technical assistance "consulting firms" directed toward cooperatives or small farmers would be one alternative.

The traditional pattern of ignoring small farms has encouraged little development of technical careers which serve that sector. Without the provision of longer-term opportunities for technical personnel, technology transfer to small farmers will become one more training ground for technical personnel who eventually find their way into the large coffee farms. While this outcome in itself is not wholly negative, it does distract technicians' attention from achieving project objectives and drain away the most experienced and capable personnel, both at the level of professionals and technicians.

4.3 Credit and Financial Problems in Technology Transfer

ISIC currently possesses a "stock" of technical recommendations for improving coffee production in spite of the problems faced over the past decade. Some of these are derived from earlier ISIC research, some from the aforementioned PROMECAFE project, and still others are the result of current research work. These recommendations have become the basis for the implementation of the ISIC-UCAFES-BFA Coffee Technology Transfer Project (TTC, its Spanish acronym, will be used), and the implementation to date offers a view of potential social impact problem areas in the implementation of the Coffee Project.

Visits to cooperatives with members involved in the TTC project revealed a concern over the administration of credit in the project. The immediate cause of the concern was that a follow-on loan to the first year of TTC was contracted with terms different from those of the initial loan. While the first loan's credits had been provided at 16% interest with a 3 year grace period, the second loan was at 20% with no grace period. Although the cooperatives were not satisfied with the arrangement, the loan approval had come late, after cooperative funds had been advanced to members in expectation of the later approval of loan funds. At

that point, the cooperatives were not in a position to turn down the loan on any terms.

Underlying the complaint about the change in credit terms was the question of loan repayment. Loans were to be repaid by the 5th or 7th year with the proceeds from the newly established coffee. Under both repayment schedules (no and three year grace periods), farmers would face negative cash flow at the beginning of loan repayment. This situation is caused and resolved by increased coffee production. Immediately following establishment of the new plantation, production is zero, rising to maximum production in the third or fourth year. Under ideal conditions with high production, rapid rate of establishment, constant coffee prices, and a three year grace period at 16%, there is a minimum period of negative cash flow followed by growing profits and finally an income of $2,000 to $3,000 per manzana. Under less than ideal conditions, the period of negative cash flow extends, and the growth of profits is slower and reaches a lower level. Considering that this activity is oriented toward poor farmers, these scenarios cause some concern, since they may temporarily push farmers even deeper into poverty.

One further set of considerations must be included. Because the preferential users of technical assistance will be small farmers, special care must be taken to ensure that technical changes do not excessively burden the current income situation of the farmer. Following the current focus on one manzana plots in the TTC project means that a small farmer with less than 5 manzanas will replant from 20% to 100% of his or her farm. Introducing the new technology results in a proportional loss of income to the farmer. As a mixed farmer and wage laborer, the farmer derives part of his or her labor from laboring off-farm and another part from "managing" family members or his or her own part-time work on the farm. Planting a new manzana of coffee results in increased financial obligations at the same time that income is reduced. If lost income from the previously existing coffee is factored into a production and income sensitivity analysis, negative cash flows can be expected under most production scenarios.

With production levels of 40 qq/mz, a selling price of 365 colones/qq, and interest rates of 22 with three years of grace or 20 with 1 year with a five year repayment period, the farmer faces negative net benefits after the first year in both cases. With a three year grace period, the farmer breaks even in year 2 (i.e. begins to perceive economic benefits greater than those produced by the former coffee plantation), with negative cash flows in the fourth and fifth years when loan repayment begins. With no grace period, the farmer faces negative cash flows for the first three years and breaks even in the fourth year. However, if maximum production reaches only 30 qq/mz, the farmer does not reach previous levels of income until the seventh or ninth year after initiation (Annex 3).

Careful consideration must be given to short-term cash flows when dealing with the low income farmer population. Drops in income lead to a tendency to use reinvestment capital for short-term consumption, reducing coffee production; a negative spiral of disinvestment and decreasing income may result in a drop in overall well-being, or the loss of the farm.

To the extent that farm incomes fall behind inflation, either due to stagnation of wages or prices for other farm products, farmer perceptions of 22% as "high" may be correct (despite their real rates of return adjusted for inflation). While these propositions should be verified empirically, farmers perceive that their incomes will not keep up with inflation. The coffee project will certainly learn from the lessons of the TTC project and build in safeguards to avoid many of the problems encountered. At the same time, prudence recommends that adjustments be made in the strategy of the coffee loan and technical assistance package.

5. IMPACT ON WOMEN

Improvements in coffee production will provide benefits to women as well as men in their capacities as farm owners, coffee laborers, and cooperative members.

The most direct benefits of improved coffee research for women will be to women who own farms. Thirty percent of farms are managed by women, who are more likely than male farmers to be owners of the land they work (McReynolds et.al. 1989). Increased productivity and efficiency will provide obvious benefits for those owners.

Women will also be indirect beneficiaries as laborers in coffee. Women are widely used in coffee production activities, although there is some segregation of activities between men and women. Men tend to do heavier work of tree felling and pruning and land preparation, but women are preferred in certain activities such as nursery management, fertilization and planting of new trees. Even more significantly from the labor perspective, women harvest coffee with no gender based disadvantages. Since coffee harvest is an activity which depends more on skill than physical strength and is paid by the amount harvested, women may realize equivalent or better incomes than men during that period. Harvest is the major period of coffee employment for temporary laborers and provides an income supplement for women both in and out of the agricultural sector.

Finally, women realize benefits from improved coffee technology as members of agrarian reform cooperatives. Membership in cooperatives does not depend on gender, and work distributions within the cooperatives include women following traditional labor patterns as mentioned above.

More importantly, cooperative administrative positions are not restricted to men. Women are actively involved in cooperative governing boards. Access to these positions cannot be described as

ideal; women tend to be involved as secretaries rather than decision makers in these groups, and none of the 25 UCRAPROBEX cooperatives has named a women as its president. On the other hand, at least one woman is a vice-president, and no institutional barriers to the involvement of women at those levels exist in the cooperatives.

In sum, Salvadorean society is not atypical in its tendency to assign women to inferior positions which do not permit their fullest participation in the wider society. The coffee project does not reinforce these inequalities but provides positive opportunities for women through access to income as both workers and farm managers. Furthermore, within the cooperative movement, women have access to remunerated positions of authority which tend to improve the overall status of women in Salvadorean society.

6. LABOR INCOME IMPACT

The clearest short-term social benefit of the improvement of coffee technology will be higher levels of employment. Coffee is a labor intensive activity with few possibilities of mechanization. It is also the major source of both permanent and temporary agricultural employment and is accessible to a broad sector of the population. The generation of salaried employment has an impact on the poorest sectors of Salvadorean society which have been faced with declining activity over the past decade and decreasing levels of activity.

Most Salvadorean farmers are only part-time farmers. Sixty-one percent seek off-farm employment during some part of the year, 85% of whom work in the agricultural sector (McReynolds et.al. 1989). This pattern derives in part from traditional land management practices. Peasant farmers prefer to produce both grain crops and coffee at low levels of intensity which do not generate high levels of employment or production. As a result, farmers must seek other employment off their farm once their limited labor absorption capabilities have been exhausted.

Coffee, on the other hand, has the potential to be a high yielding product with significant labor absorption capacity. Per manzana labor absorption can be more than tripled through technology intensification; ISIC socio-economic research found that high intensity coffee production occupied 236 days of work per manzana, while "traditional" management strategies only required 71.7 days (ISIC-PROMECAFE-IICA-AID 1984).

Higher levels of coffee employment will have an additional positive impact for small farmers as an increased capacity for on-farm employment generation. Improved coffee management will generate both income and work, increasing the possibilities for economic independence. As farmers become less dependent on the larger labor market, they will be less constrained by off-farm labor needs and able to dedicate more time to their own crops. As is commonly recognized, small farmers have a tendency to make higher labor investments per unit land than larger producers; the realization of

this tendency in Salvadorean coffee has been impeded by a lack of technology and capital. Improved access to technology will have multiple social benefits for small farmers.

7. CONCLUSION AND RECOMMENDATIONS

Conclusions and recommendations regarding social impact are closely tied to the historical context of Salvadorean society. Social, economic and technical institutions have combined to concentrate the highest quality resources for coffee in the hands of a minority of the population. The recent agrarian reform has redistributed some of these resources, but this process is far from complete. More importantly, the poor farmers identified as the primary beneficiaries of the coffee project have been systematically excluded, by both the pre-reform and post-reform policies, from access to these resources in the quantity and quality necessary to achieve a socially acceptable minimum standard of living. The technical portfolio of ISIC has been determined by this historical Salvadorean context, and special considerations are necessary to rectify earlier biases.

A fundamental change will be necessary in PROCAFE to ensure that the institution will orient its research so that it is applicable to the conditions of the majority of Salvadorean coffee farmers. PROCAFE must develop capabilities to identify research and technical change as a function of the social objective of providing technology to small farmers. This is not a simple question of directing technology transfer toward small producers, but a question of fundamental research questions which should be addressed by the institution.

Historically, the focus of ISIC has been on the development of coffee production technologies for the middle and high elevation coffee production areas. As a result of elite control of those production areas and research and marketing institutions, a mutually reinforcing framework of economic and technical strategies have developed favoring those ecological areas. On average, lower elevation producers have lower levels of production due to both environmental and economic constraints; nevertheless, experiments in "bajio" production with new varieties show impressive possibilities for high yields under good conditions. The research emphasis has created a "blind spot" in information regarding elevations below 900m which is as much a product of the elite research bias toward the higher altitudes as it is a result of technical considerations.

The doctrine that development goals are best served by encouraging the economic growth of the traditional elite classes so that benefits trickle down to the broader population has proven to be extremely shortsighted. Short-term economic gains from such a strategy are overshadowed in the middle-term by the demands for social equity. These demands often are transformed into social confrontations and unrest as the economically "efficient" sector confronts what it perceives as unjustified claims to distribute

their share of national wealth toward the lower end of the economic spectrum.

PROCAFE designers and governors should not lose sight of the social goals of the coffee project: the provision of technical assistance and information to small producers. Although this carries slightly higher short-term costs than a strict "economic" focus, the long-term benefits in terms of prosperity and social adjustment outweigh these costs.

7.1 Recommendations

1) The design of the coffee project should recognize an overall objective of increasing the low-income small farmer share of national coffee production.

2) To rectify the traditional technological bias, PROCAFE must develop a research orientation mechanism which focuses on small farmers, such as charging a PROCAFE research committee with evaluating small farmer impact of current and proposed research, and through the representation of low-income small farmer interests on PROCAFE's governing board.

3) PROCAFE must develop a comprehensive research and monitoring capability for small farmers to identify patterns of farm management and processes of change and to support the process of research definition.

4) Technology transfer recommendations must be designed for small farmers, taking into account their farm management patterns, cash-flow conditions, on-farm capital availability, off-farm labor commitments, and ecological conditions.

5) Technical assistance coverage must be broadened through the promotion of cooperative development.

6) Career paths must be developed which motivate technology transfer personnel to consider technical assistance to small farmers as a permanent career.

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Table 1.
Coffee: Area Cultivated by Region and Altitude - 1985-88 (mzs)

Altitude	Region I	Region II	Region III	Total	%
Bajio	62,469	48,825	31,000	142,294	61%
Media	26,847	20,917	12,918	60,682	26%
Estricta Altura	20,112	7,497	3,626	32,235	13%
Total	109,428	77,239	47,544	31,235	
Percent	47%	33%	20%		100%

Regions: I: Ahuachapan, Santa Ana, Sonsonate.
II: La Libertad, San Salvador, La Paz, Cuscatlan, San Vicente
III: Usulatan, San Miguel, Morazan.

Source: ISIC, INCAFE, BCR, MIPLAN. Politica Nacional de Produccion de Cafe, 1986. Taken from Garza n.d.

Table 2.
Average Cost by Production Level and Region

Level QQ/mz	Region I Average qq/mz	Region I Colones/ qq oro	Region II Average qq/mz	Region II Colones/ qq oro	Region III Average qq/mz	Region III Colones/ qq oro
30 qq/ mz	32.93 (3)	158.94	30 (1)	166.75	.	.
20 - 30 qq/mz	22.56 (11)	197.79	23.96 (6)	186.89	24.08 (3)	175.35
10 - 20 qq/mz	15.42 (20)	206.72	14.31 (15)	206.56	14.11 (13)	196.69
< 10 qq/mz	7.56 (13)	253.63	7.65 (10)	250.25	7.78 (6)	271.81

Number in parenthesis is number of observations per category
Source: Garza n.d.

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Table 3.
Average Cost per Quintal Oro per Manzana
By size of farm and altitude

Region I

Altitude	< 10 mzs	10-50 mzs	50-200 mzs	> 200 mzs
Low	227.30	226.94	224.05	216.13
Medium	235.41	194.10	201.19	—
High	—	231.94	200.48	148.40

Region II

Altitude	< 10 mzs	10-50 mzs	50-200 mzs	> 200 mzs
Low	200.62	173.45	233.50	405.95
Medium	226.30	215.62	182.57	221.95
High	173.50	—	—	164.25

Region III

Altitude	< 10 mzs	10-50 mzs	50-200 mzs	> 200 mzs
Low	225.41	215.00	233.84	—
Medium	182.42	232.15	228.38	209.68
High	207.57	153.37	166.08	—

Source: Garza n.d.

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Table 4.

Size of Holding (has)	Number of Producers Producers	% of all Coffee	Assistance Organization			
			UCRAPROBEX	UCAFES	OTHER COOPS	UNASSOCIATED
UCRAPROBE	17096	32.9	17096			
0 - 2	20946	40.3		4476	123	16347
2 - 5	6059	11.7				6059
5 - 20	4424	8.5				0
20 - 50	2079	4.0				
50 - 100	954	1.8				
100 - 20	366	0.7				
200 +	161	0.3				
Totals			17096	4476	123	22406

Table 5. COOPS. De la Fase I de la Reforma Agraria

Nombre	area(mza)	80/81	81/82	82/83	83/84	84/85	85/86	QQ/MZ promo
		producción qq oro para 6 anos						
Region I								
Sonsonate								
Las Lajas	670	12,511	15,105	16,500	14,844	13,366	11,418	20.83
Los Lagartos	829	11,068	7,093	12,193	11,515	9,625	5,592	11.48
El Bazamar	157	942	852	655	580	800	1,356	5.50
St Marta Las Trincheras	100	810	459	1,138	597	276	525	6.34
El Suiza	581	3,671	3,494	6,290	n/a	n/a	13,118	11.43
Las Victorias	951	14,900	21,508	22,044	22,004	19,285	12,367	19.65
Las Victorias	42	384	509	688	160	462	261	9.78
El Carmen	48	363	388	827	393	492	443	10.09
San Luis	525	6,044	3,270	7,592	9,065	4,854	2,494	10.58
San Rafael	107	4,445	3,310	3,355	5,685	4,194	3,515	38.17
San Isidro	2,263	30,033	25,856	46,500	26,998	41,141	19,015	13.96
Chiguileca	12	151	136	148	63	85	129	9.89
Santa Crus Tarulath	15	35	42	35	n/a	n/a	70	3.03
Santa Magdalena	100	812	335	958	466	600	417	5.98
Buena Vista	39	330	200	352	219	265	n/a	7.01
San Jose Mirimar	300	2,702	3,279	3,005	2,640	2,789	2,200	9.23
Totales	**6,739**	**89,201**	**85,836**	**122,280**	**95,229**	**98,234**	**72,921**	**13.94**
Ahuachapan								
Nejapa	206	2,470	2,104	2,771	2,124	2,513	1,584	10.98
La Labor	1,200	16,287	22,666	16,041	20,511	17,688	10,800	14.44
San Alfonso Miramar	92	470	720	595	n/a	n/a	561	6.37
Zacamil	100	200	400	101	128	172	151	1.92
El Salto	585	7,870	7,717	5,481	4,721	6,066	5,002	10.50
El Obrajuelo	27	80	92	97	164	82	148	4.09
San Raimundo	62	385	293	292	520	428	603	6.78
Miramar	361	1,567	3,421	1,570	3,077	2,730	1,119	6.23
Las Colinas	200	4,732	3,411	3,014	3,600	3,859	2,538	17.63
San Juan Bosco	20	65	100	130	52	51	49	3.73
Matala	436	3,535	4,068	3,548	2,760	3,209	2,824	7.62
San Miguel	287	2,000	1,819	2,200	2,200	1,297	1,680	6.50
La Ceibo o El Porvenir	17	180	250	237	333	310	397	16.74
Totales	**3,593**	**39,841**	**47,061**	**36,077**	**40,190**	**38,405**	**27,455**	**10.62**
Santa Ana								
San Geronimo	15	176	174	174	n/a	n/a	120	11.10
San Rafael El Porvenir	19	816	435	524	639	675	466	12.09
San Rafael La Parada	84	372	1,100	627	825	709	853	8.90
San Antonio Zacamil	80	1,015	1,120	709	1,071	1,000	866	12.04
La Ceiba o Criba	5	6	10	9	8	9	36	2.60
Las Cruces	151	7,103	5,204	7,819	6,531	6,848	3,999	41.39
Los Pinos	353	7,593	9,285	9,285	7,035	8,909	7,923	23.62
Santa Adela	555	17,906	10,406	17,944	13,797	14,843	13,492	26.54
Las Tablas	5	37	35	31	40	35	60	7.95
La Magdalena	255	1,500	1,650	1,791	1,990	2,059	2,035	7.21
Paraje Galan	16	213	128	120	361	210	251	13.37
El Refugio	738	18,345	15,505	18,465	15,036	18,054	10,288	21.61
San Cayetano	24	165	264	143	180	189	94	7.19
Rancho Montevista	148	430	610	1,881	3,108	1,507	2,470	11.27
Singuil I y II	50	170	90	90	53	36	30	1.56
La Presa	490	2,875	6,250	4,898	6,556	6,728	4,537	10.83
El Potosi	232	n/a	n/a	n/a	n/a	n/a	3,601	15.52
La Palma	45	n/a	n/a	n/a	n/a	n/a	587	13.04
Totales	**3,295**	**58,722**	**52,266**	**64,510**	**57,230**	**61,810**	**51,710**	**17.52**
Total Region I	**13,627**	**187,764**	**185,163**	**222,867**	**192,649**	**198,449**	**152,086**	**13.93**
La Libertad								
Santa Marta	75	425	425	454	n/a	n/a	n/a	2.90
Buena Vista	41	506	600	753	379	578	524	13.55

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Tacachico	9	16	37	65	19	52	18	3.84
Pasatiempo	514	10,449	10,745	8,902	6,337	8,193	21,038	21.29
Los Abriles y El 14	463	9,060	8,780	8,973	4,789	5,185	4,576	14.89
La Isla	13	60	63	56	7	77	92	4.56
Chanmico	481	8,457	9,235	11,131	5,588	8,243	5,785	16.78
San Lorenzo	15	200	147	124	71	156	189	10.19
Sitio Grande	22	413	437	707	656	549	411	24.04
Colombia	154	2,558	4,271	3,475	1,330	2,599	1,688	17.29
El Jabali	258	3,648	3,961	3,400	3,708	3,671	4,002	14.46
San Andres	179	2,480	1,970	1,800	1,362	1,650	1,730	10.23
Las Mercedes	6	72	62	83	18	59	24	8.83
El Espino	1,000	26,582	26,564	31,336	24,520	27,280	28,150	27.41
Florencia	982	23,375	17,766	26,541	17,351	21,465	16,277	20.84
El Triunfo	47	731	730	1,020	286	696	504	14.07
San Isidro	200	976	1,143	1,361	464	998	918	4.88
Comaesland	42	141	119	135	55	100	86	2.52
Agua Fria	1,660	40,190	31,812	36,164	28,459	34,146	31,656	20.32
El Transito	274	4,429	3,508	5,288	1,123	3,797	2,866	12.78
Santa Adelaida	800	17,095	17,929	18,503	13,968	10,072	12,240	18.71
Las Quebradas	340	10,044	8,286	9,354	5,235	8,194	5,590	22.89
San Fernando	13	47	58	53	23	18	32	2.96
El Chaguite	385	6,516	6,766	8,358	3,792	6,079	4,348	15.52
El Pinal	227	1,859	2,100	1,731	1,582	1,804	1,412	7.70
Aruba	190	4,012	3,325	4,639	1,052	2,546	2,443	15.80
San Antonio	250	3,900	4,700	4,600	5,774	4,792	3,673	18.29
El Faro	300	2,153	1,093	1,636	879	1,992	1,542	5.16
El Sitio	12	41	59	152	31	72	29	5.33
Hacienda Nueva	400	2,980	1,867	2,854	890	1,961	2,224	5.32
El Espritu Santo	10	73	82	80	n/a	n/a	n/a	7.83
Los Izotes	84	400	280	329	157	243	314	3.42
Las Granadillas	273	4,785	6,006	5,662	5,449	5,362	5,746	20.15
Providencia – La Concordia	136	1,614	1,036	2,500	703	1,503	947	10.17
El Porvenir	64	249	309	292	n/a	n/a	260	2.89
Totales	9,918	190,536	176,271	202,511	136,057	164,132	161,331	17.32
San Salvador								
El Guaje	330	4,535	4,014	5,819	5,333	4,924	5,852	15.39
Tutultepeque	199	2,661	1,547	2,626	1,578	2,026	866	9.47
El Angel	585	3,768	3,676	4,452	2,190	2,610	1,495	5.18
Santa Maria Las Mercedes	180	4,617	5,427	5,764	6,804	4,502	6,250	30.89
Suchinango	154	1,856	1,612	1,800	1,535	1,717	1,267	10.59
Orlita	16	81	121	113	n/a	n/a	n/a	6.56
Santa Teresa	40	425	746	190	n/a	n/a	n/a	11.34
Totales	1,504	17,943	17,143	20,764	17,440	15,779	15,730	11.61
Total Region II	11,422	208,479	193,414	223,275	153,497	179,911	177,061	16.57
La Paz								
San Simon	507	8,037	5,325	5,700	3,282	5,639	2,280	9.95
Los Angeles	81	500	891	1,215	524	468	753	8.95
Santa Barabara	1	0	0	0	n/a	n/a	n/a	0.00
Totales	589	8,537	6,216	6,915	3,806	6,107	3,033	9.79
San Vicente								
San Antonio	40	n/a	n/a	n/a	n/a	n/a	52	1.30
Nuevo Oriente			area conflictiva					
El Marquezado, Nuevo Oriente			area conflictiva					
Totales	40	n/a	n/a	n/a	n/a	n/a	52	1.30
Total Region III	589	8,537	6,216	6,915	3,806	6,107		8.94

Usulutan								
San Mauricio	448	3,959	3,078	4,263	1,677	3,243	1,949	6.76
Bagatela	90	765	1,979	1,216	1,888	1,327	1,980	16.95
Santa Maria	119	2,429	2,879	2,769	3,076	2,918	1,751	22.16
El Mane, Saltillo, Verdun	190	4,482	2,719	5,136	3,072	3,981	1,414	18.25
Las Glorias	118	667	843	1,017	608	683	705	6.39
Jalapa	12	77	94	155	54	115	92	8.15
La Violeta	165	2,088	1,847	2,704	681	1,691	1,488	10.61
Santa Elvira	250	1,482	1,516	1,333	643	1,243	925	4.76
La Cabana	36	141	73	160	71	181	934	7.22
Totales	**1,428**	**16,090**	**15,028**	**18,753**	**11,770**	**15,382**	**11,237**	**10.30**
San Miguel								
La Esperanza	225	1,415	2,034	1,537	1,043	1,802	853	6.43
Totales	**225**	**1,415**	**2,034**	**1,537**	**1,043**	**1,802**	**853**	**6.43**
Morazan								
San Carlos	860	12,941	15,103	9,825	10,158	11,482	9,963	13.46
Totales	**860**	**12,941**	**15,103**	**9,825**	**10,158**	**11,482**	**9,963**	**13.46**
La Union								
El Faro	361	3,043	4,662	5,745	3,254	4,173	2,939	11.00
Suravay	425	5,614	4,600	10,347	6,331	6,633	5,509	15.31
San Francisco Gualpirque	40	114	n/a	n/a	233	173	253	4.83
Totales	**826**	**8,771**	**9,262**	**16,092**	**9,818**	**10,979**	**8,700**	**12.84**
Total Region IV	3,339	39,217	41,427	46,207	32,789	39,645	30,753	11.48
Total Nacional	28,977	443,997	426,220	499,264	382,741	424,112	359,899	14.59

ANNEX G

CREDIT REQUIREMENTS AND AVAILABILITY

The Project Paper identifies a set of manzanas to be affected by the Project from 1991 to 1996. Based on these assumptions, an estimate of the credit requirements was made. At the same time, the availability of credit in the banking system was assessed.

Coffee farmers will require two kinds of credit: (a) investment, and (b) maintenance. The banking system has experience in lending for maintenance credit, and the Central Bank of Reserve has provided adequate resources for this purpose. Maintenance credit is provided according to the farmer's average production for the last three years, and credit recuperation is usually done in coordination with the "beneficios" where the producer processes his coffee. There are adequate facilities and experience to accommodate the needs. Thus, the analysis is concentrated on investment credit.

Credit Requirements. Coffee producers were grouped into three separate categories according to the source of funding:

1. Cooperatives of the Agrarian Reform affiliated to UCRAPROBEX
2. Cooperatives affiliated to UCAFES
3. Other producers not included in 1 and 2.

Credit requirements per year were estimated assuming a rate of renovation (partial and total) for each one of the above groups according to the PP, and a lending level equal to 80 percent of the budgets analyzed. This resulted in US$1,650.00 per manzana the first year, and US$332.00 the second year for total renovation. For partial renovation the figure was US$594.00 per manzana during the first year. No investment credit is required the second year. The terms assumed for total renovation were 7 years, with a 3 years grace period on capital. For partial renovation the terms assumed were 5 years, with a 2 years grace period. It was also assumed that a one year loan would be provided for nurseries at a level of US$0.12 per plant. The number of plants for total renovation was assumed at 3,500 plants per manzana, and for partial renovation a total of 1,750 plants.

Table 1 summarizes the additional requirements per year, as well as the accumulated needs. These numbers only reflect the additional funds per year. They assume that recuperations would be used for the same purpose. Total requirements for 1991 would be 1.2 million dollars, for 1992 an additional 5.9 million dollars are required. By 1993 the additional requirement is 11.4 million, in 1994 another 15.6 million, in 1995 another 17.9 million, and 12.7 million in 1996. The total cumulative requirements add up to 65 million.

Availability of Funds. Prior to 1990 the banking system had many credit lines from different sources and a wide array of terms and conditions. The Central Bank of Reserve has grouped most of the existing lines into two large lines: a) the Investment Credit Fund (Fondo de Crédito Para Inversiones), and b) maintenance credit.

The Investment Credit Fund has a volume of about 300 million colones at the moment. Coffee is one of the activities that could use this resource. Credit terms for coffee could be as high as 12 years, with up to 5 years grace period. Current interest rate is 22 percent to the user. Commercial banks receive the funds at 17 percent, keeping a differential of 5 percent for intermediation.

Besides the Central Bank's attempt of grouping all the funds into one, there are still some specialized funds that can be used for coffee investment. These are AID 519-0307, for agrarian reform participants, A.I.D. 519-0263, and 15 million colones loaned to UCAFES by the Banco de Fomento.

The A.I.D. 519-0307 is for the agrarian reform. It has a about 400 million colones, and can be used for any crop. This fund is already being used for coffee investment.

The A.I.D. 519-0263 is a fund of 275 million colones used through the Banco de Fomento. However, 40 million have been invested in bonds in accordance to FRAP/BCR regulations, leaving the fund in 235 million. Of this, 170 million is in outstanding loans, and the difference (65 million is available in cash). If managed properly, this fund could grow from the differential created with the increase in interest rates. Another possibility is by placing the fund in an interest bearing account instead of a non interest account, where they are at the moment.

As expressed by the Bank's President and the General Manager, this fund could be used to extend the facilities to UCAFES, if A.I.D. authorizes. They would also like to use the fund to lend to other coffee producers for renovation. UCAFES needs to make a request, then the Bank would consult A.I.D., as well as the Central Bank of Reserve to get the authorization to provide the intermediation required by UCAFES and its cooperative to manage the smaller individual loans to its members.

The 15 million loaned to UCAFES for coffee renovation has been used to finance the renovation of 1,074 manzanas of coffee of 1,074 small farmers members of cooperatives affiliated to UCAFES. The loans were granted for 7 years, with a 3 year grace period. Interest rate was 16 percent to the farmer. The intermediation fee was 2 percent for each, UCAFES and the participating cooperative.

The program started in 1987, and the first payments were due in 1990. According to UCAFES, the member cooperatives have paid about 70 percent of amounts due. Arrears are higher at the cooperative level. They say that the main reason for the arrears was the drought, which reduced expected yields but they are confident of recuperating those amounts this crop year.

Credit Access for Different Groups. There are four different groups that can be identified for the use of credit:

1. Agrarian reform participants affiliated to URCAPROBEX
2. Farmers associated in cooperatives affiliated to UCAFES
3. Independent small farmers
4. Independent large farmers

The banking system has enough credit to satisfy the coffee investment requirements identified. However, present procedures do not allow some groups to access these resources.

The agrarian reform participants have a system in operation that allows them to use the funds assigned for their use. Large farmers, independent or associated, have a working relationship with lending institutions, and know how to use credit. UCAFES could access the funds managed by the Banco de Fomento. That leaves small independent farmers, who do not have a workable mechanism to access the financial resources in the system.

Recommendation. It is recommended that a long-term credit advisor be included in the technical assistance team. This advisor would be responsible to develop systems to provide investment credit for small coffee farmers. He will be responsible for coordinating the activities required to make sure the systems function adequately and the small farmer is able to renovate his coffee area. His responsibilities could be extended to improving the credit delivery system designed for the agrarian reform participants and UCAFES' members. He should study and monitor these systems to improve them as required. His responsibilities should also include the training of a credit specialist at the Agricultural Economics Department of PROCAFE, who would be in charge of studying and coordinating credit for the coffee sector. These should include: identification of requirement; projection of credit needs; coordination with the Salvadoran Coffee Council, the Central Bank of Reserve and the banking system; and development of system that will be suitable for different groups in the coffee sector.

ANNEX H

ECONOMIC ANALYSIS TABLES

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECET

A. Summary of Economic Analysis Results.

Variable	Unit	Base	Sensitity Analysis A	B	C	D	E
FINANCIAL IRR TO FARMER							
TOTAL RENOVATION							
REDUCTION IN EXPORT TAXES							
Expected Prices	%	27.60			18.30		
25 % reduction in prices	%	15.00			6.80		
EXPORT TAX AS IS							
Expected Prices	%	20.70			12.10		
25 % reduction in prices	%	8.10			0.00		
PARTIAL RENOVATION							
REDUCTION IN EXPORT TAXES							
Expected Prices	%	45.60			29.70		
25 % reduction in prices	%	34.30			19.50		
EXPORT TAX AS IS							
Expected Prices	%	37.80			23.10		
25 % reduction in prices	%	25.40			10.20		
ECONOMIC IRR							
With projected prices	%	30.4	27.1	24.7	22.4	19.9	29.1
25 % reduction in prices	%	20.4	18.0	16.2	13.1	11.3	19.5
40 % reduction in prices	%	12.1	10.4	9.0	4.9	3.7	11.6
EMPLOYMENT GENERATION							
1991/92	Person-years	823	411	274	823	411	0
1996/97	Person-years	15,496	7,748	5,165	14,931	7,466	12,327
NET FOREIGN EXCHANGE							
Total in 21 Years	Million US$	1,646	819	543	1,215	603	1,389
Average	Million US$	78	39	26	58	29	66
NPV at 15% Discount	Million US$	276	135	88	195	94	219
DOMESTIC RESOURCE COST							
Total in 21 Years	Million US$	654	331	223	556	282	554
Average	Million US$	31	16	11	26	13	26
NPV at 15% Discount	Million US$	133	69	48	114	60	107
D.R.C./US$	US$/US$	0.48	0.51	0.54	0.59	0.63	0.49
VALUE ADDED							
Total in 21 Years	Million US$	1,600	800	533	1,175	588	1,352
Average	Million US$	76	38	25	56	28	64
NPV at 15% Discount	Million US$	286	143	95	206	103	228

Sensitity Analysis:
A: 50 % reduction in area affected.
B: 66 % reduction in area affected.
C: 20 % reduction in expected yields.
D: 20 % reduction in expected yields and 50 % reduction in area affected.
E: Project startup is delayed one year, and initial benefits are lost.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECET

A. Summary of Economic Analysis Results.

Variable	Unit	Base	A	B	C	D	E
		Sensitity Analysis					
FINANCIAL IRR TO FARMER							
TOTAL RENOVATION							
REDUCTION IN EXPORT TAXES							
Expected Prices	%	27.60			18.30		
25 % reduction in prices	%	15.00			6.80		
EXPORT TAX AS IS							
Expected Prices	%	20.70			12.10		
25 % reduction in prices	%	8.10			0.00		
PARTIAL RENOVATION							
REDUCTION IN EXPORT TAXES							
Expected Prices	%	45.60			29.70		
25 % reduction in prices	%	34.30			19.50		
EXPORT TAX AS IS							
Expected Prices	%	37.80			23.10		
25 % reduction in prices	%	25.40			10.20		
ECONOMIC IRR							
With projected prices	%	30.4	27.1	24.7	22.4	19.9	29.1
25 % reduction in prices	%	20.4	18.0	16.2	13.1	11.3	19.6
40 % reduction in prices	%	12.1	10.4	9.0	4.9	3.7	11.6
EMPLOYMENT GENERATION							
1991/92	Person-years	823	411	274	823	411	0
1996/97	Person-years	15,496	7,748	5,165	14,931	7,466	12,327
NET FOREIGN EXCHANGE							
Total in 21 Years	Million US$	1,646	819	543	1,215	603	1,389
Average	Million US$	78	39	26	58	29	66
NPV at 15% Discount	Million US$	276	135	88	195	94	219
DOMESTIC RESOURCE COST							
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NPV at 15% Discount	Million US$	133	69	48	114	60	107
D.R.C./US$	US$/US$	0.48	0.51	0.54	0.59	0.63	0.49
VALUE ADDED							
Total in 21 Years	Million US$	1,600	800	533	1,175	588	1,352
Average	Million US$	76	38	25	56	28	64
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Sensitity Analysis:
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D: 20 % reduction in expected yields and 50 % reduction in area affected.
E: Project startup is delayed one year, and initial benefits are lost.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 1. Unit Prices (1990)

Input	Unit	Unit Price	(Colones)
Exchange Rate	Colones/US$	7.90	
FORMULA 16-20-0	$/Kg.	0.20	1.58
Ammonium Sulfate	$/Kg.	0.12	0.93
UREA	$/Kg.	0.24	1.91
MATERIA ORGANICA	$/00.	0.25	2.00
PLANTIA	$/Plant	0.19	1.50
THIODAN	$/Liter	6.18	48.80
Malathion 57%	$/Liter	2.53	20.00
Volaton 2.5%	$/Liter	0.25	2.00
OXICLORURO DE COBRE	$/Kg.	2.09	16.50
Counter 10% G	$/Kg.	0.46	3.64
Pegason	$/Liter	1.90	15.00
AGUA	$/Galon	0.01	0.10
ARBOLES SOMBRA	$/Tree	0.13	1.00
PITA	$/Roll	0.32	2.50
Wire	$/Lb.	0.25	2.00
GANDUL	$/Lb.	0.32	2.50
COPALCHI	$/Lb.	0.06	0.50
Unskilled labor	$/Man-days	2.06	16.28
Caporales	$/Man-days	2.58	20.35
Harvest	$/qq oro	15.19	120.00
Caporales-harvest	$/Man-days	3.24	25.62
Weight man	$/Man-days	2.59	20.50
Gard	$/Man-days	2.59	20.50
Transportation	$/qq oro	1.42	11.25
Beneficio (Average)	$/Man-days	3.80	30.00
Processing cost	$/qq oro	8.23	65.00
Farm Gate Coffee Price	$/qq oro	57.59	455.00
Harvest Per Man-Day	qq/Man-day	0.20	

Source: ISIC

Table 2. Requirement of Inputs per Year - Total Renovation (Continued) Page 2

Description	Unit	Year 1	2	3	4	5	6
Sampling of pests and diseases	Man-days			0.20	0.20	0.20	0.20
Fence maintenance	Man-days	3.00	3.00	3.00	3.00	3.00	3.00
Replanting and shade formation	Man-days	1.00	0.50				
Elimination of Temporary shade	Man-days		2.00		3.00		
Erosion control	Man-days	2.00	1.00	1.00	1.00	1.00	1.00
Pruning 25 %	Man-days					8.00	8.00
SUB-TOTAL - BEFORE HARVEST		395.40	49.50	63.20	62.20	77.20	78.20
HARVEST							
Production	qq ore		5.00	15.00	25.00	30.00	25.00
Labor Use	Man-days		1.00	3.00	5.00	6.00	5.00
TOTAL LABOR USE		395.40	50.50	66.20	67.20	83.20	83.20

Source: ISIC

Yield Adjustment Factor 1.00

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Table 2. Requirement of Inputs per Year - Total Renovation

Description	Unit	Year 1	2	3	4	5	6
PURCHASED INPUTS							
Formula 16-20-0	Kgs.	200	200	400	600	600	600
Urea	Kgs.	200	300	200	300	300	300
Organic Matter	qq.	555					
Plants	Plants	3,333	167	167	167	167	167
Thiodan	Liters			2	2	2	2
Velaton 2.5 %	Liters	150	150	150	150	150	150
Copper chlorine oxide	Kgs.	6	6	6	6	6	6
Water	Galons	150	150	300	300	300	300
Shade trees	Trees	76	5	5	5	5	5
Rope	Rolls	20					
Peagon peas	Lbs.	20					
Copalchi	Lbs.	100					
LABOR							
Cutting old coffee trees	Man-days	44.00					
Cutting shade trees	Man-days	80.00					
Land clearing	Man-days	16.00					
Make sticks	Man-days	17.00					
Form layout and stick	Man-days	11.00					
Digg holes	Man-days	56.00	2.75	2.75	2.75	2.75	2.75
Apply organic matter	Man-days	40.00					
Coffee planting and fert. app.	Man-days	23.00					
Plant temporary shade	Man-days	2.00					
Plant permanent shade	Man-days	4.00	0.25	0.25	0.25	0.25	0.25
Layout curtain	Man-days	2.00					
Plant curtain	Man-days	5.00					
Prune shade	Man-days			1.00	2.00	6.00	6.00
"Plomeado" of curtain	Man-days		3.00	3.00	3.00	4.00	5.00
Carry coffee trees	Man-days	46.40	2.00	2.00	2.00	2.00	2.00
Plant coffee trees	Man-days	3.00	3.00	3.00	3.00	3.00	3.00
First fertilizer appl.	Man-days	2.00	2.00	2.00	4.50	6.00	6.00
Second fertilizer appl.	Man-days	2.00	2.00	2.00	4.50	3.00	3.00
Third fertilizer appl.	Man-days	2.00	2.00	2.00			
First weeding	Man-days	8.00	8.00	8.00	8.00	8.00	8.00
Second weeding	Man-days	8.00	8.00	8.00	8.00	8.00	8.00
Third weeding	Man-days	8.00		8.00			
First "deshije"	Man-days					3.00	3.00
Second "deshije"	Man-days					2.00	2.00
First control of coffee rust	Man-days	2.00	2.50	3.00	3.00	3.00	3.00
Second control of coffee rust	Man-days	2.00	2.50	3.00	3.00	3.00	3.00
First control of coffee borer	Man-days			3.00	3.00	3.00	3.00
Second control of coffee borer	Man-days			3.00	3.00	3.00	3.00
Control of other pests	Man-days	6.00	5.00	5.00	5.00	5.00	5.00

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 3. Requirement of Inputs per Year - Partial Renovation

Description	Unit	Year 1	2	3	4	5	6	7
PURCHASED INPUTS								
Formula 16-20-0	Kgs.	133	137	71	188	116	29	
Ammonium Sulphate	Kgs.	298	362	443	474	581	875	946.82
Urea	Kgs.	5.40	5.45	5.45	5.45	5.45	5.45	5.45
Plants	Plants	1,200		30	30	111		111.00
Thiodan 35%	Liters	1	1	1	1	1	1	1
Malathion 57%	Liters	1	1	1	1	1	1	1
Copper chlorine oxide	Kgs.	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Counter 10% G	Kgs.	5.91	5.91	8.45	0.45	1.36	1.36	1.36
Pegasan	Liters	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Water	Galons	200	200	200	200	200	200	200.00
Shade trees	Trees	100						
Wire	Lbs.							
LABOR								
Prune coffee trees	Man-days	4.00		4.00			3	
Dig holes and appl. fert.	Man-days	30.00				8.00	6.00	6.00
"Encasillado"	Man-days	3.00	3.00			3.00	3.00	3.00
Prune Shade	Man-days	20.00	12.00	12.00	12.00	12.00	12.00	12.00
Carry coffee trees	Man-days	6.00	3.00					
Replanting	Man-days	3.00		1.00	1.00	2.00		2.00
Fertilizer application	Man-days	4.00	5.00	5.50	6.00	7.00	9.00	9.50
Weed Control	Man-days	24.00	24.00	24.00	24.00	24.00	24.00	24.00
"Deshije"	Man-days	4.00	4.00	4.00	4.00	6.00	6.00	6.00
"Agobio"	Man-days			32.00			11.00	
Coffee Rust Control	Man-days	6.00	6.00	6.00	3.00	6.00	6.00	6.00
Coffee Borer Control	Man-days	3.00	3.00	3.00	1.00	3.00	3.00	3.00
Control of other pests	Man-days	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Fence maintenance	Man-days					3.00		3.00
Soil Conservation	Man-days	8.00	8.00	8.00	8.00	3.00	3.00	3.00
SUB-TOTAL - BEFORE HARVEST		118.00	71.00	102.50	62.00	80.00	86.00	80.50
HARVEST								
Production	qq oro	5.00	7.00	9.00	18.00	28.00	30.00	25.00
Labor Use	Man-days	1.00	1.40	1.80	3.60	5.60	6.00	5.00
TOTAL LABOR USE		119.00	72.40	106.30	65.60	85.60	92.00	85.50

Source: ISIC

Yield Adjustment Factor 1.00

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Table 4. Requirement of Inputs per Year - Improved Cultural Practices.

Description	Unit	Year 1	2	3	4	5	6	7
PURCHASED INPUTS								
Formula 16-20-0	Kgs.	133	137	71	188	188	188	188
Ammonium Sulphate	Kgs.	298	362	443	474	474	474	474
Urea	Kgs.	5.40	5.45	5.45	5.45	5.45	5.45	5.45
Plants	Plants	111	111	111	111	111	111	111
Thiodan 35%	Liters	1	1	1	1	1	1	1
Malathion 57%	Liters	1	1	1	1	1	1	1
Copper chlorine oxide	Kgs.	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Counter 10% G	Kgs.	5.91	5.91	0.45	0.45	1.36	1.36	1.36
Pegason	Liters	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Water	Galons	200	200	200	200	200	200	200.00
Shade trees	Trees	100						
Wire	Lbs.							
LABOR								
Prune coffee trees	Man-days	4.00		6.00			3	
Digg holes and app. fert.	Man-days	3.00				8.00	6.00	6.00
"Encasillado"	Man-days	3.00	3.00			3.00	3.00	3.00
Prune shade trees	Man-days	20.00	12.00	12.00	12.00	12.00	12.00	12.00
Carry coffee trees	Man-days	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Replanting	Man-days	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fertilizer application	Man-days	4.00	5.00	5.50	6.00	6.00	6.00	6.00
Weed Control	Man-days	24.00	24.00	24.00	24.00	24.00	24.00	24.00
"Deshije"	Man-days	6.00	6.00	6.00	6.00	6.00	6.00	6.00
"Agobio"	Man-days			32.00			11.00	
Coffee Rust Control	Man-days	6.00	6.00	6.00	3.00	6.00	6.00	6.00
Coffee Borer Control	Man-days	3.00	3.00	3.00	1.00	3.00	3.00	3.00
Control of other pests	Man-days	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Fence maintenance	Man-days					3.00		3.00
Soil Conservation	Man-days	8.00	8.00	8.00	8.00	3.00	3.00	3.00
SUB-TOTAL - BEFORE HARVEST		86.00	70.00	103.50	63.00	79.00	85.00	77.00
HARVEST								
Production	qq oro	6.00	8.00	8.00	9.00	9.00	10.00	11.00
Labor Use	Man-days	1.20	1.60	1.60	1.80	1.80	2.00	2.20
TOTAL LABOR USE		85.20	71.60	105.10	64.80	80.80	87.00	79.20

Source: ISIC

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 5. Requirement of Inputs per Year - Total Renovation or Improved Cultural Practices - Without Project.

Description	Unit	Year 1	2	3	4	5	6
PURCHASED INPUTS							
Ammonium Sulphate	Kgs.	293	293	293	293	293	293
Plants	Plants	25.00		25.00			25.00
Copper chlorine oxide	Kgs.	5.00	5.00	5.00	5.00	5.00	5.00
LABOR							
Fertilizer Application	Man-days	6.40	6.40	6.40	6.40	6.40	6.40
Shade pruning	Man-days	10.90	10.90	10.90	10.90	10.90	10.90
Weed control	Man-days	6.00	6.00	6.00	6.00	6.00	6.00
"Deshije"	Man-days	7.60	7.60	7.60	7.60	7.60	7.60
Pruning 25 %	Man-days	8.30	8.30	8.30	8.30	8.30	8.30
"Caporales"	Man-days	1.50	1.50	1.50	1.50	1.50	1.50
SUB-TOTAL - BEFORE HARVEST		40.70	40.70	40.70	40.70	40.70	40.70
HARVEST							
Production	qq ore	6.00	6.00	6.00	6.00	6.00	6.00
Labor Use	Man-days	1.20	1.20	1.20	1.20	1.20	1.20
TOTAL LABOR USE	Man-days	41.90	41.90	41.90	41.90	41.90	41.90

Source: ISIC

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 6. Requirement of Inputs per Year - Partial Renovation - Without the Project.

Description	Unit	Year 1	2	3	4	5	6
PURCHASED INPUTS							
Ammonium Sulphate	Kgs.	600	600	600	600	600	600
Plants	Plants	110		110		110	110
Copper chlorine oxide	Kgs.	6.60	6.60	6.60	6.60	6.60	6.60
Shade Trees	Trees	24.00			24.00		24.00
Rope	Rolls	7.20				7.20	7.20
LABOR							
Fertilizer Application	Man-days	6.00	6.40	6.40	6.40	6.40	6.40
Shade prunning	Man-days	10.00	10.00	10.00	10.00	10.00	10.00
Weed control	Man-days	16.00	16.00	16.00	16.00	16.00	16.00
Coffee Rust Control	Man-days	4.50	4.50	4.50	4.50	4.50	4.50
"Deshije	Man-days	3.50	3.50	3.50	3.50	3.50	3.50
Active Maintenance	Man-days	0.50	0.50	0.50	0.50	0.50	0.50
Replanting	Man-days	5.00	5.00	5.00	5.00	5.00	5.00
Prunning	Man-days	8.30	8.30	8.30	8.30	8.30	8.30
SUB-TOTAL - BEFORE HARVEST		53.80	56.20	56.20	56.20	56.20	56.20
HARVEST							
Production	qq ore	10.00	10.00	10.00	10.00	10.00	10.00
Labor Use	Man-days	2.00	2.00	2.00	2.00	2.00	2.00
TOTAL LABOR USE	Man-days	55.80	56.20	56.20	56.20	56.20	56.20

Source: ISIC

Table 7. Investment Cost per Year - Total Renovation (US$) Page 2

Description	Year 1	2	3	4	5	6
Second control of coffee borer			6.18	6.18	6.18	6.18
Control of other pests	12.36	10.30	10.30	10.30	10.30	10.30
Sampling of pests and diseases			0.41	0.41	0.41	0.41
Fence maintenance	6.18	6.18	6.18	6.18	6.18	6.18
Replanting and shade formation	2.06	1.03				
Elimination of Temporary shade		4.12		6.18		
Erosion control	4.12	2.06	2.06	2.06	2.06	2.06
Pruning 25 %					16.49	16.49
SUB-TOTAL - LABOR	814.82	102.01	130.24	128.18	159.09	161.15
SUB-TOTAL	1,964.61	312.10	370.33	445.18	476.09	478.15
Unexpected (5 %)	98.23	15.60	18.52	22.26	23.80	23.91
AGRICULTURE-PRE-HARVEST	2,062.84	327.70	388.87	467.44	499.90	502.06
HARVEST						
Production (qq)		5.00	15.00	25.00	30.00	25.00
Harvest		75.95	227.85	379.75	455.70	379.75
Transportation		7.12	21.36	35.60	42.72	35.60
Sub-Total		83.07	249.21	415.35	498.42	415.35
Unexpected (5 %)		4.15	12.46	20.77	24.92	20.77
SUB-TOTAL HARVEST		87.22	261.67	436.12	523.34	436.12
TOTAL AGRICULTURE	2,062.84	414.92	650.54	903.55	1,023.23	938.17
Labor	814.82	177.96	358.09	587.93	614.79	540.90
Imported Components	605.42	120.99	139.01	180.07	180.07	180.07
Other	642.60	115.98	153.45	215.55	228.37	217.20
INDUSTRIAL AND MARKETING COSTS						
Labor		20.57	61.71	102.85	123.42	102.85
Imported Component		4.11	12.34	20.57	24.68	20.57
Other		16.46	49.37	82.28	98.73	82.28
Sub-Total		41.14	123.42	205.70	246.84	205.70
TOTAL FINANCIAL COSTS						
Labor	814.82	198.53	419.80	610.77	738.20	643.75
Imported Component	605.42	125.10	151.35	200.64	214.76	200.64
Other	642.60	132.43	202.81	297.83	327.11	299.48
Sub-Total	2,062.84	456.06	773.96	1,109.25	1,270.07	1,143.87
Sub-total (domestic)	1,457.42	330.96	622.61	908.61	1,065.31	943.23

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Table 7. Investment Cost per Year - Total Renovation (US$)

Description	Year 1	2	3	4	5	6
PURCHASED INPUTS						
Formula 16-20-0	40.00	40.00	80.00	120.00	120.00	120.00
Urea	48.46	72.68	48.46	72.68	72.68	72.68
Organic Matter	140.51					
Plants	432.85	31.71	31.71	31.71	31.71	31.71
Thiodan			12.35	12.35	12.35	12.35
Volaton 2.5 %	37.97	37.97	37.97	37.97	37.97	37.97
Copper chlorine oxide	8.35	12.53	12.53	12.53	12.53	12.53
Water	1.90	1.90	3.80	3.80	3.80	3.80
Shade trees	9.62	0.63	0.63	0.63	0.63	0.63
Rope	6.33					
Peagon peas	6.33					
Copalchi	6.33					
SUT-TOTAL INPUTS	938.65	197.43	227.46	291.68	291.68	291.68
Transportation of Inputs	211.14	12.66	12.66	25.32	25.32	25.32
LABOR						
Cutting old coffee trees	90.67					
Cutting shade trees	164.86					
Land clearing	32.97					
Make sticks	33.03					
Farm layout and stick	22.67					
Digg holes	115.40	5.67	5.67	5.67	5.67	5.67
Apply organic matter	82.43					
Coffee planting and fert. app.	47.40					
Plant temporary shade	4.12					
Plant permanent shade	8.24	0.52	0.52	0.52	0.52	0.52
Layout curtain	4.12					
Plant curtain	10.30					
Prune shade			2.06	4.12	12.36	12.36
"Plomeado" of curtain		6.18	6.18	6.18	8.24	10.30
Carry coffee trees	95.62	4.12	4.12	4.12	4.12	4.12
Plant coffee trees	6.18	6.18	6.18	6.18	6.18	6.18
First fertilizer appl.	4.12	4.12	4.12	9.27	12.36	12.36
Second fertilizer appl.	4.12	4.12	4.12	9.27	6.18	6.18
Third fertilizer appl.	4.12	4.12	4.12			
First weeding	16.49	16.49	16.49	16.49	16.49	16.49
Second weeding	16.49	16.49	16.49	16.49	16.49	16.49
Third weeding	16.49		16.49			
First "deshije"					6.18	6.18
Second "deshije"					4.12	4.12
First control of coffee rust	4.12	5.15	6.18	6.18	6.18	6.18
Second control of coffee rust	4.12	5.15	6.18	6.18	6.18	6.18
First control of coffee borer			6.18	6.18	6.18	6.18

Table 7. Investment Cost per Year - Total Renovation (US$) Page 3

Description	Year 1	2	3	4	5	6
ECONOMIC COSTS						
ADJUSTMENT FACTORS						
Labor	0.85	0.85	0.85	0.85	0.85	0.85
Foreign Exchange	1.00	1.00	1.00	1.00	1.00	1.00
ECONOMIC COSTS - BEFORE INDIRECT TAXES						
Labor	693	169	357	519	627	547
Imported Components	605	125	151	201	205	201
Others	643	132	203	298	327	299
Sub-Total	1,941	426	711	1,018	1,159	1,047
Indirect Taxes	39	9	14	20	23	21
TOTAL ECONOMIC COSTS	1,902	418	697	997	1,136	1,026
LABOR USE (Man-Days)						
Agriculture	395	51	66	67	83	83
Industry	0	5	16	27	33	27
Total Man-Days	395	56	82	94	116	110
Intermediate Inputs	706.79	200.77	256.56	359.20	372.08	359.20

Source: Tables 1 and 2.

Table 8. Investment Cost per Year - Partial Renovation (US$) Page 2

Description	Year 1	2	3	4	5	6	7
TOTAL AGRICULTURE	742.93	380.83	487.24	582.62	814.18	859.22	784.42
Labor	319.12	252.44	347.94	401.18	590.18	632.92	545.64
Iported Components	208.64	59.53	60.96	75.77	84.83	83.00	96.85
Other	215.18	68.44	78.35	105.66	139.17	143.30	141.93
INDUSTRIAL AND MARKETING COSTS							
Labor	20.57	28.80	37.03	74.05	115.19	123.42	102.85
Imported Component	4.11	5.76	7.41	14.81	23.04	24.68	20.57
Other	16.46	23.04	29.62	59.24	92.15	98.73	82.28
Sub-Total	41.14	57.59	74.05	148.10	230.38	246.84	205.70
TOTAL FINANCIAL COSTS							
Labor	339.69	281.44	384.96	475.24	705.37	756.34	648.49
Imported Component	212.75	65.31	68.37	90.58	107.87	107.68	117.42
Other	231.63	91.48	107.97	164.90	231.32	242.03	224.21
Sub-Total	784.07	438.43	561.29	730.72	1,044.55	1,106.05	990.12
Sub-total (domestic)	571.32	373.12	492.93	640.14	936.68	998.37	872.70
ECONOMIC COSTS							
ADJUSTMENT FACTORS							
Labor	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Foreign Exchange	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ECONOMIC COSTS - BEFORE INDIRECT TAXES							
Labor	289	239	327	404	600	643	551
Imported Components	213	65	68	91	108	108	117
Others	232	92	108	165	231	242	224
Sub-Total	733	396	504	659	939	993	893
Indirect Taxes	15	8	10	13	19	20	18
TOTAL ECONOMIC COSTS	718	388	493	646	920	973	875
LABOR USE (Man-Days)							
Agriculture	119	72	104	66	86	92	86
Industry	5	8	10	20	30	33	27
Total Man-Days	124	80	114	85	116	125	113
Intermediate Inputs	234.70	118.12	122.49	170.43	202.73	219.94	215.47

Source: Tables 1 and 3.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 8. Investment Cost per Year - Partial Renovation (US$)

Description	Year 1	2	3	4	5	6	7
PURCHASED INPUTS							
Formula 16-20-0	26.60	27.45	14.27	37.64	23.27	5.73	0.00
Ammonium Sulphate	35.08	42.59	54.53	55.81	68.39	103.01	111.46
Urea	1.31	1.32	1.32	1.32	1.32	1.32	1.32
Plants	227.85	0.00	5.70	5.70	21.08	0.00	21.08
Thiodan 35%	6.18	6.18	6.18	6.18	6.18	6.18	6.18
Malathion 57%	2.53	2.53	2.53	2.53	2.53	2.53	2.53
Copper chlorine oxide	12.53	12.54	12.54	12.53	12.53	12.53	12.53
Counter 10% G	2.72	2.72	0.21	0.21	0.63	0.63	0.63
Pegason	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Water	2.53	2.53	2.53	2.53	2.53	2.53	2.53
Shade trees	12.66					0.76	
Wire							
SUT-TOTAL INPUTS	330.94	98.52	100.76	125.40	139.40	136.16	159.21
Transportation of Inputs	50.38	1.27	2.53	2.66	5.95	6.49	6.62
LABOR							
Prune coffee trees	8.24		8.24		16.49	12.36	12.36
Digg holes and appl. fer	61.82				6.18	6.18	6.18
"Encasillado"	6.18	6.18					
Prune Shade	41.22	24.73	24.73	24.73	24.73	24.73	24.73
Carry coffee trees	12.36	6.18					
Replanting	6.18		2.06	2.06	4.12		4.12
Fertilizer application	8.24	10.30	11.33	12.36	14.43	18.55	19.58
Weed Control	49.46	49.46	49.46	49.46	49.46	49.46	49.46
"Deshije"	8.24	8.24	8.24	8.24	12.36	12.36	12.36
"Agobio"	0.00	0.00	65.94	0.00	0.00	22.67	0.00
Coffee Rust Control	12.36	12.36	12.36	6.18	12.36	12.36	12.36
Coffee Borer Control	6.18	6.18	6.18	2.06	6.18	6.18	6.18
Control of other pests	6.18	6.18	6.18	6.18	6.18	6.18	6.18
Fence maintenance					6.18		6.18
Soil Conservation	16.49	16.49	16.49	16.49	6.18	6.18	6.18
SUB-TOTAL - LABOR	243.17	146.31	211.23	127.77	166.86	177.23	165.89
SUB-TOTAL	624.49	246.40	314.52	255.82	310.22	319.88	331.72
Unexpected (5 %)	31.22	12.32	15.73	12.79	15.51	15.99	16.59
AGRICULTURE-PRE-HARVEST	655.71	258.72	330.24	268.61	325.73	335.88	348.30
HARVEST							
Production (qq)	5.00	7.00	9.00	18.00	28.00	30.00	25.00
Harvest	75.95	106.33	136.71	273.42	425.32	455.70	379.75
Transportation	7.12	9.97	12.82	25.63	39.87	42.72	35.60
Sub-Total	83.07	116.30	149.53	299.05	465.19	498.42	415.35
Unexpected (5 %)	4.15	5.81	7.48	14.95	23.26	24.92	20.77
SUB-TOTAL HARVEST	87.22	122.11	157.00	314.00	488.45	523.34	436.12

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EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 9. Investment Cost per Year - Improved Cultural Practice (US$)

Description	Year 1	2	3	4	5	6	7
PURCHASED INPUTS							
Formula 16-20-0	26.60	27.45	14.27	37.66	37.66	37.66	37.66
Ammonium Sulphate	35.08	42.59	54.53	55.81	55.31	55.81	55.81
Urea	1.31	1.32	1.32	1.32	1.32	1.32	1.32
Plants	21.08	28.10	21.08	21.08	21.08	21.08	21.08
Thiodan 35%	6.18	6.18	6.18	6.18	6.18	6.18	6.18
Malathion 57%	2.53	2.53	2.53	2.53	2.53	2.53	2.53
Copper chlorine oxide	12.53	12.54	12.54	12.53	12.53	12.53	12.53
Counter 10% G	2.72	2.72	0.21	0.21	0.63	0.63	0.63
Pegason	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Water	2.53	2.53	2.53	2.53	2.53	2.53	2.53
Shade trees	12.66					0.76	
Wire							
SUT-TOTAL INPUTS	124.16	126.92	116.14	140.78	141.19	141.95	141.19
Transportation of Inputs	50.38	1.27	2.53	2.66	5.95	6.49	6.62
LABOR							
Prune coffee trees	8.24		8.24		16.49	12.36	12.36
Digg holes and app. fert.	6.18				6.18	6.18	6.18
"Encasillado"	6.18	6.18					
Prune shade trees	41.22	24.73	24.73	24.73	24.73	24.73	24.73
Carry coffee trees	2.06	2.06	2.06	2.06	2.06	2.06	2.06
Replanting	2.06	2.06	2.06	2.06	2.06	2.06	2.06
Fertilizer application	8.24	10.30	11.33	12.36	12.36	12.36	12.36
Weed Control	49.46	49.46	49.46	49.46	49.46	49.46	49.46
"Desnije"	8.24	8.24	8.24	8.24	12.36	12.36	12.36
"Agoaio"			65.94			22.67	
Coffee Rust Control	12.36	12.36	12.36	6.18	12.36	12.36	12.36
Coffee Borer Control	6.18	6.18	6.18	2.06	6.18	6.18	6.18
Control of other pests	6.18	6.18	6.18	6.18	6.18	6.18	6.18
Fence maintenance					6.18		6.18
Soil Conservation	16.49	16.49	16.49	16.49	6.18	6.18	6.18
SUB-TOTAL - LABOR	173.10	144.25	213.29	129.83	162.30	175.16	158.68
SUB-TOTAL	347.65	272.44	331.96	273.26	309.94	323.61	306.49
Unexpected (5 %)	17.38	13.62	16.60	13.66	15.50	16.18	15.32
AGRICULTURE-PRE-HARVEST	365.03	286.06	348.56	286.92	325.44	339.79	321.82
HARVEST							
Production (qq)	6.00	8.00	8.00	9.00	9.00	10.00	11.00
Harvest	91.14	121.52	121.52	136.71	136.71	151.90	167.09
Transportation	8.54	11.39	11.39	12.82	12.82	14.24	15.66
Sub-Total	99.68	132.91	132.91	149.53	149.53	166.14	182.75
Unexpected (5 %)	4.98	6.65	6.65	7.48	7.48	8.31	9.14
SUB-TOTAL HARVEST	104.67	139.56	139.56	157.00	157.00	174.45	191.89

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EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 14. Financial Internal Rate of Return to Farmer - Partial Renovatio

Year	Cost Bef. (US$)	Cost After (US$)	Cost Net (US$)	Add. Work. Cap. (US$)	Production Bef (qq)	Production Aft (qq)	Production Net (qq)	Price (1)	Price (2)	Additional Revenue (1)	Additional Revenue (2)	Additional Net Income (1)	Additional Net Income (2)
1991/92	410	743	333		10	5	(5)	67	47	(334)	(233)	(667)	(567)
1992/93	383	381	(2)		10	7	(3)	66	46	(198)	(139)	(196)	(136)
1993/94	405	487	82	74	10	9	(1)	71	50	(71)	(50)	(228)	(206)
1994/95	386	583	196	103	10	18	8	78	54	622	436	323	136
1995/96	407	814	407	189	10	28	18	79	55	1,425	998	829	401
1996/97	411	859	449	38	10	30	20	79	55	1,583	1,108	1,097	622
1997/98	411	859	449	0	10	25	15	79	55	1,188	831	739	383
1998/99	411	859	449	0	10	25	15	79	55	1,188	831	739	383
1999/00	411	859	449	0	10	25	15	79	55	1,188	831	739	383
2000/01	411	859	449	0	10	25	15	79	55	1,188	831	739	383
2001/02	411	859	449	0	10	25	15	79	55	1,188	831	739	383
2002/03	178	859	681	209	10	25	15	79	55	1,188	831	297	(59)
2003/04	178	859	681	0	10	25	15	79	55	1,188	831	506	150
2004/05	178	859	681	0	10	25	15	79	55	1,188	831	506	150
2005/06	178	859	681	0	10	25	15	79	55	1,188	831	506	150
2006/07	161	859	699	(613)	10	25	15	79	55	1,188	831	1,102	746
IRR												37.8%	25.4%

Source: Tables 8 and 12.

Note: Price (2) = 0.7 x Price (1).

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EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 13. Financial Rate of Return to Farmer - Total Renovation

Year	Cost Bef.	Cost After (US$)	Cost Net	Add. Work. Cap. (US$)	Production Bef (qq)	Production Aft (qq)	Production Net (qq)	Price (1)	Price (2)	Additional Income (1)	Additional Income (2)	Additional Net Benefits (1)	Additional Net Benefits (2)
1991/92	247	2,063	1,816		6		(6)	67	47	(400)	(280)	(2,216)	(2,096)
1992/93	242	415	173		6	5	(1)	71	49	(71)	(49)	(244)	(222)
1993/94	247	651	404	363	6	15	9	82	58	739	518	(27)	(249)
1994/95	242	904	662	232	6	25	19	93	65	1,776	1,243	882	349
1995/96	242	1,023	781	108	6	30	24	95	67	2,289	1,602	1,400	713
1996/97	247	938	691	(81)	6	25	19	95	67	1,812	1,268	1,202	658
1997/98	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
1998/99	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
1999/00	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2000/01	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2001/02	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2002/03	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2003/04	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2004/05	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2005/06	247	938	691	0	6	25	19	95	67	1,812	1,268	1,121	577
2006/07	247	938	691	(622)	6	25	19	95	67	1,812	1,268	1,743	1,199
IRR												27.6%	15.0%

Source: Tables 7, 10 and 12.

Note: Price (2) = 0.75 x Price (1).

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 12. Assumed Coffee Prices

(Constant 1990 US$)

Description	Unit	Coffee Year 1991/92	1992/93	1993/94	1994/95	1995/96
Price "C" NY	$/46 kgs.	97.00	95.00	101.73	109.81	109.81
Differential SCC	$/46 kgs.	5.00	4.00	3.00	2.00	0.00
Minimum FOB registration price	$/46 kgs.	92.00	91.00	98.73	107.81	109.81
Export Tax	$/46 kgs.	14.10	13.80	16.12	18.84	19.44
Registration SCC	$/46 kgs.	0.50	0.50	0.50	0.50	0.50
ISIC contribution	$/46 kgs.	1.00	1.00	1.00	1.00	1.00
FOB price in C	$/46 kgs.	77.40	76.70	82.11	88.47	89.87
Processing and handling	$/46 kgs.	10.70	10.70	10.70	10.70	10.70
Farm Gate Price	$/46 kgs.	66.70	66.00	71.41	77.77	79.17

Source: Projected Price "C" N.Y. are based on several studies and conversations with economists at the World Bank who work with a world commodities model. It is assumed that with the project, average coffee quality will increase, reducing the differential for quality. It is assumed that the export tax will remain as present.

Table 11. Cost to the Farmer per Year - Partial Renovation - Without the Project. (US$) Page 2

Description	Year 1	2	3	4	5	6
TOTAL FINANCIAL COSTS						
Labor	303.91	304.73	304.73	304.73	304.73	304.73
Imported Component	75.10	59.38	71.91	61.20	73.28	75.10
Other	112.91	101.16	110.56	102.52	111.58	112.95
Sub-Total	491.91	465.27	487.20	468.46	489.59	492.78
Sub-total (domestic)	416.81	405.89	415.29	407.25	416.31	417.68
ECONOMIC COSTS						
ADJUSTMENT FACTORS						
Labor	0.85	0.85	0.85	0.85	0.85	0.85
Foreign Exchange	1.00	1.00	1.00	1.00	1.00	1.00
ECONOMIC COSTS - BEFORE INDIRECT TAXES						
Labor	258	259	259	259	259	259
Imported Components	75	59	72	61	73	75
Others	113	101	111	103	112	113
Sub-Total	446	420	441	423	444	447
Indirect Taxes	9	8	9	8	9	9
TOTAL ECONOMIC COSTS	437	411	433	414	435	438
LABOR USE (Man-Days)						
Agriculture	56	56	56	56	56	56
Industry	11	11	11	11	11	11
Total Man-Days	67	67	67	67	67	67
Intermediate Inputs	124.26	112.68	118.94	115.72	121.22	126.26

Source: Tables 1 and 6.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 11. Cost to the Farmer per Year - Partial Renovation - Without the Project. (US$)

Description	Year 1	2	3	4	5	6
PURCHASED INPUTS						
Ammonium Sulphate	70.63	70.63	70.63	70.63	70.63	70.63
Plants	20.89		20.89	re	20.89	20.89
Copper chlorine oxide	13.78	13.78	13.78	13.78	13.78	13.78
Shade Trees	3.04			3.04	0.00	3.04
Rope	2.28				2.28	2.28
SUT-TOTAL INPUTS	110.62	84.42	105.30	87.46	107.58	110.62
Transportation of Inputs	2.50	2.50	2.50	2.50	2.50	2.50
LABOR						
Fertilizer Application	12.36	13.19	13.19	13.19	13.19	13.19
Shade prunning	20.61	20.61	20.61	20.61	20.61	20.61
Weed control	32.97	32.97	32.97	32.97	32.97	32.97
Coffee rust control	9.27	9.27	9.27	9.27	9.27	9.27
"Deshije"	7.21	7.21	7.21	7.21	7.21	7.21
Active Maintenance	1.03	1.03	1.03	1.03	1.03	1.03
Replanting	10.30	10.30	10.30	10.30	10.30	10.30
Prunning	17.10	17.10	17.10	17.10	17.10	17.10
SUB-TOTAL - LABOR	110.87	111.69	111.69	111.69	111.69	111.69
SUB-TOTAL	223.99	198.61	219.50	201.65	221.78	224.81
Unexpected (5 %)	11.20	9.93	10.97	10.08	11.09	11.24
AGRICULTURE-PRE-HARVEST	235.19	208.54	230.47	211.73	232.86	236.05
HARVEST						
Production (qq)	10.00	10.00	10.00	10.00	10.00	10.00
Harvest	151.90	151.90	151.90	151.90	151.90	151.90
Transportation	14.24	14.24	14.24	14.24	14.24	14.24
Sub-Total	166.14	166.14	166.14	166.14	166.14	166.14
Unexpected (5 %)	8.31	8.31	8.31	8.31	8.31	8.31
SUB-TOTAL HARVEST	174.45	174.45	174.45	174.45	174.45	174.45
TOTAL AGRICULTURE	409.63	382.99	404.92	386.18	407.31	410.50
Labor	262.77	263.59	263.59	263.59	263.59	263.59
Iported Components	66.87	51.15	63.68	52.97	65.05	66.87
Other	80.00	68.25	77.64	69.61	78.67	80.04
INDUSTRIAL AND MARKETING COSTS						
Labor	41.14	41.14	41.14	41.14	41.14	41.14
Imported Component	8.23	8.23	8.23	8.23	8.23	8.23
Other	32.91	32.91	32.91	32.91	32.91	32.91
Sub-Total	82.28	82.28	82.28	82.28	82.28	82.28

Table 10. Cost to the Farmer per Year - Total Renovation or Improved Cultural Practices - Without the Project. (US$)

Page 2

Description	Year 1	2	3	4	5	6
TOTAL FINANCIAL COSTS						
Labor	200.47	200.47	200.47	200.47	200.47	200.47
Imported Component	34.95	32.10	34.95	32.10	32.10	34.95
Other	60.71	58.58	60.71	58.58	58.58	60.71
Sub-Total	296.13	291.15	296.13	291.15	291.15	296.13
Sub-total (domestic)	261.18	259.05	261.18	259.05	259.05	261.18
ECONOMIC COSTS						
ADJUSTMENT FACTORS						
Labor	0.85	0.85	0.85	0.85	0.85	0.85
Foreign Exchange	1.00	1.00	1.00	1.00	1.00	1.00
ECONOMIC COSTS - BEFORE INDIRECT TAXES						
Labor	170	170	170	170	170	170
Imported Components	35	32	35	32	32	35
Others	61	59	61	59	59	61
Sub-Total	266	261	266	261	261	266
Indirect Taxes	5	5	5	5	5	5
TOTAL ECONOMIC COSTS	261	256	261	256	256	261
LABOR USE (Man-Days)						
Agriculture	42	42	42	42	42	42
Industry	7	7	7	7	7	7
Total Man-Days	48	48	48	48	48	48
Intermediate Inputs	66.14	61.39	66.14	61.39	61.39	66.14

Source: Tables 1 and 5.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 10. Cost to the Farmer per Year - Total Renovation or Improved Cultural Practices - Without the Project. (US$)

Description	Year 1	2	3	4	5	6
PURCHASED INPUTS						
Ammonium Sulphate	34.49	34.49	34.49	34.49	34.49	34.49
Plants	4.75		4.75			4.75
Copper chlorine oxide	10.44	10.44	10.44	10.44	10.44	10.44
SUT-TOTAL INPUTS	49.68	44.94	49.68	44.94	44.94	49.68
Transportation of Inputs	1.00	1.00	1.00	1.00	1.00	1.00
LABOR						
Fertilizer Application	13.19	13.19	13.19	13.19	13.19	13.19
Shade prunning	22.46	22.46	22.46	22.46	22.46	22.46
Weed control	12.36	12.36	12.36	12.36	12.36	12.36
"Desnije"	15.66	15.66	15.66	15.66	15.66	15.66
Prunning 25 %	17.10	17.10	17.10	17.10	17.10	17.10
"Cacorales"	3.86	3.86	3.86	3.86	3.86	3.86
SUB-TOTAL - LABOR	84.65	84.65	84.65	84.65	84.65	84.65
SUB-TOTAL	135.33	130.58	135.33	130.58	130.58	135.33
Unexpected (5 %)	6.77	6.53	6.77	6.53	6.53	6.77
AGRICULTURE-PRE-HARVEST	142.09	137.11	142.09	137.11	137.11	142.09
HARVEST						
Production (qq)	6.00	6.00	6.00	6.00	6.00	6.00
Harvest	91.14	91.14	91.14	91.14	91.14	91.14
Transportation	8.54	8.54	8.54	8.54	8.54	8.54
Sub-Total	99.68	99.68	99.68	99.68	99.68	99.68
Unexpected (5 %)	4.98	4.98	4.98	4.98	4.98	4.98
SUB-TOTAL HARVEST	104.67	104.67	104.67	104.67	104.67	104.67
TOTAL AGRICULTURE	246.76	241.78	246.76	241.78	241.78	246.76
Labor	175.78	175.78	175.78	175.78	175.78	175.78
Iported Components	30.01	27.16	30.01	27.16	27.16	30.01
Other	40.97	38.83	40.97	38.83	38.83	40.97
INDUSTRIAL AND MARKETING COSTS						
Labor	24.68	24.68	24.68	24.68	24.68	24.68
Imported Component	4.94	4.94	4.94	4.94	4.94	4.94
Other	19.75	19.75	19.75	19.75	19.75	19.75
Sub-Total	49.37	49.37	49.37	49.37	49.37	49.37

Table 9. Investment Cost per Year - Improved Cultural Practices (US$) Page 2

Description	Year 1	2	3	4	5	6	7
TOTAL AGRICULTURE	469.70	425.62	488.11	443.93	482.44	514.26	513.71
Labor	264.24	265.77	334.81	246.54	299.31	327.06	325.77
Imported Components	84.57	76.41	70.19	85.00	85.91	86.47	86.04
Other	120.88	83.44	83.12	92.39	97.03	100.70	101.90
INDUSTRIAL AND MARKETING COSTS							
Labor	24.68	32.91	32.91	37.03	37.03	41.14	45.25
Imported Component	4.94	6.58	6.58	7.41	7.41	8.23	9.05
Other	19.75	26.33	26.33	29.62	29.62	32.91	36.20
Sub-Total	49.37	65.82	65.82	74.05	74.05	82.28	90.51
TOTAL FINANCIAL COSTS							
Labor	288.93	298.68	367.72	303.56	336.53	368.20	371.02
Imported Component	89.51	82.99	76.77	92.40	93.31	94.70	95.09
Other	140.63	109.77	109.45	122.01	126.65	133.62	138.10
Sub-Total	519.07	491.44	553.93	517.98	556.49	596.52	604.21
Sub-total (domestic)	429.55	408.65	477.16	425.57	463.18	501.82	509.12
ECONOMIC COSTS							
ADJUSTMENT FACTORS							
Labor	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Foreign Exchange	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ECONOMIC COSTS - BEFORE INDIRECT TAXES							
Labor	246	254	313	258	286	313	315
Imported Components	90	83	77	92	93	95	95
Others	141	110	109	122	127	134	138
Sub-Total	476	447	499	472	506	541	549
Indirect Taxes	10	9	10	9	10	11	11
TOTAL ECONOMIC COSTS	466	438	489	463	496	530	538
LABOR USE (Man-Days)							
Agriculture	85	72	105	65	81	87	79
Industry	7	9	9	10	10	11	12
Total Man-Days	92	80	114	75	91	98	91
Intermediate Inputs	175.25	129.12	126.52	151.86	155.57	159.45	161.40

Source: Tables 1 and 4.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 15. Cash Flow Analuysis for a Farmer Borrowing Funds - Total Renovation (One Manzana).

(Colones/Mz.)

Description		Year 1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
RENOVATED MANZANA								
Agricultural Financial Expenses		16,296	3,278	5,139	7,138	8,084	7,412	7,412
PRODUCTION								
Quintales Pergamino Seco			5.00	15.00	25.00	30.00	25.00	25.00
Price			521	564	614	625	625	625
Value			2,607	8,463	15,360	18,763	15,636	15,636
OPERATING BALANCE		(16,296)	(671)	3,323	8,222	10,680	8,225	8,225
INVESTMENT CREDIT								
Disbursements		16,296	3,278					
Interests	7%	913	1,324	1,370	1,370	1,028	685	343
Payment of Principal					4,894	4,894	4,894	4,894
Payment of Interest		913	1,324	1,370	1,370	1,028	685	343
Balance		16,296	19,574	19,574	14,681	9,787	4,894	0
MAINTENANCE CREDIT								
Disbursements				5,139	7,138	8,084	7,412	7,412
Interests	5%			206	286	323	296	296
Payment of Principal				5,139	7,138	8,084	7,412	7,412
Payment of Interest				206	286	323	296	296
Balance				0	0	0	0	0
CREDIT SUMMARY								
Disbursements		16,296	3,278	5,139	7,138	8,084	7,412	7,412
Interests		913	1,324	1,576	1,656	1,351	982	639
Payment of Principal		0	0	5,139	12,032	12,977	12,305	12,305
Payment of Interest		913	1,324	1,576	1,656	1,351	982	639
Balance		16,296	19,574	19,574	14,681	9,787	4,894	0
NET CASH FLOW FROM RENOVATED MZ		(913)	1,283	1,748	1,672	4,435	2,350	2,692
OLD MANZANA								
Agricultural Financial Expenses		1,949	1,910	1,949	1,910	1,910	1,949	1,949
PRODUCTION								
Quintales Pergamino Seco		6	6	6	6	6	6	6
Price		527	521	564	614	625	625	625
Value		3,162	3,129	3,385	3,686	3,753	3,753	3,753
OPERATING BALANCE		1,212	1,219	1,436	1,776	1,843	1,803	1,803
NET CASH FLOW TO FARMER		(2,125)	64	312	(104)	2,593	546	889
CUMMULATIVE CASH FLOW		(2,125)	(2,061)	(1,749)	(1,853)	740	1,286	2,175

Source: Tables 7, 10 and Estimates. Scenario: Export Tax as present.

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Table 16. Cash Flow Analuysis for a Farmer Borrowing Funds - Partial Renovation.

Description		Year 1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/
RENOVATED MANZANA								
Agricultural Financial Expenses		5,869	3,009	3,849	4,603	6,432	6,788	6,19
PRODUCTION								
Quintales Pergamino Seco		5.00	7.00	9.00	18.00	28.00	30.00	30.0
Price		526.96	521.43	564.18	614.39	625.45	625.45	625.4
Value		2,635	3,650	5,078	11,059	17,513	18,763	18,76
OPERATING BALANCE		(3,234)	641	1,229	6,456	11,081	11,976	12,56
INVESTMENT CREDIT								
Disbursements		5,869						
Interests	7%	329	411	411	274	137		
Payment of Principal				1,956	1,956	1,956		
Payment of Interest		329	411	411	274	137		
Balance		5,869	5,869	3,913	1,956	0		
MAINTENANCE CREDIT								
Disbursements			3,009	3,849	4,603	6,432	6,788	6,19
Interests	5%		120	154	184	257	272	24
Payment of Principal			3,009	3,849	4,603	6,432	6,788	6,19
Payment of Interest			120	154	184	257	272	24
Balance			0	0	0	0	0	0
CREDIT SUMMARY								
Disbursements		5,869	3,009	3,849	4,603	6,432	6,788	6,197
Interests		329	531	565	458	394	272	249
Payment of Principal		0	3,009	5,806	6,559	8,388	6,788	6,197
Payment of Interest		329	531	565	458	394	272	249
Balance		5,869	5,869	3,913	1,956	0	0	0
NET CASH FLOW FROM RENOVATED MZ.		2,306	110	(1,293)	4,042	8,730	11,704	12,319
OLD MANZANA								
Agricultural Financial Expenses		3,236	3,026	3,199	3,051	3,218	3,243	3,243
PRODUCTION								
Quintales Pergamino Seco		10	10	10	10	10	10	10
Price		527	521	564	614	625	625	625
Value		5,270	5,214	5,642	6,144	6,254	6,254	6,254
OPERATING BALANCE		2,033	2,189	2,443	3,093	3,037	3,012	3,012
NET CASH FLOW TO FARMER		273	(2,078)	(3,736)	949	5,693	8,693	9,307
COMMULATIVE CASH FLOW		273	(1,806)	(5,542)	(4,593)	1,101	9,793	19,100

Source: Tables 8 and 12. Scenario: Export Tax as present.

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Table 17. Coffee Production Without the Project, 191/92 to 2011/12. 1,000 (GG. ORO EQUIVALENT)

Yield				Number of Mzs. Renovated			Production of Manzanas Renovated or With Improved Cultural Practices in Year																					
							1991	1992					1993			1994			1995			1996						
Par	Tot	ICP	Year	Par.	Total	ICP	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP
10	6	6	1991/92	0	0	4,750	29																					
10	6	6	1992/93	2,000	2,000	9,000	29	20	12	54																		
10	6	6	1993/94	5,000	4,000	10,000	29	20	12	54	50	24	60															
10	6	6	1994/95	7,000	6,000	12,000	29	20	12	54	50	24	60	70	36	72												
10	6	6	1995/96	8,000	7,000	12,000	29	20	12	54	50	24	60	70	36	72	80	42	72									
10	6	6	1996/97	8,500	7,750	12,000	29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	1997/98				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	1998/99				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	1999/00				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2000/01				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2001/02				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2002/03				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2003/04				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2004/05				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2005/06				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
10	6	6	2006/07				29	20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
			2007/08					20	12	54	50	24	60	70	36	72	80	42	72	85	47	72						
			2008/09								50	24	60	70	36	72	80	42	72	85	47	72						
			2009/10											70	36	72	80	42	72	85	47	72						
			2010/11														80	42	72	85	47	72						
			2011/12																	85	47	72						

Source: Tables 5 and 6.

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Table 18. Coffee Production Due To Project, 1991/92 to 2011/12. 1,000 (QQ. ORO EQUIVALENT)

Yield Par	Yield Tot	Yield ICP	Year	Number of Mzs. Renovated Par.	Number of Mzs. Renovated Total	Number of Mzs. Renovated ICP	1991 ICP	1992 Par.	1992 Tot.	1992 ICP	1993 Par.	1993 Tot.	1993 ICP	1994 Par.	1994 Tot.	1994 ICP	1995 Par.	1995 Tot.	1995 ICP	1996 Par.	1996 Tot.	1996 ICP	TOTAL	Without Project	Net
5		6	1991/92			4,750	29																29	29	0
7	5	8	1992/93	2,000	2,000	9,000	38	10		54													102	115	(13)
9	15	8	1993/94	5,000	4,000	10,000	38	14	10	72	25		60										219	249	(30)
18	25	9	1994/95	7,000	6,000	12,000	43	18	30	72	35	20	80	35		72							405	427	(22)
28	30	9	1995/96	8,000	7,000	12,000	43	36	50	81	45	60	80	49	30	96	40		72				482	621	61
30	25	10	1996/97	8,500	7,750	12,000	48	56	60	81	90	100	90	63	90	96	56	35	96	43		72	1,075	824	251
25	25	11	1997/98				52	60	50	90	140	120	90	126	150	108	72	105	96	60	39	96	1,454	824	630
25	25	11	1998/99				52	50	50	99	150	100	100	196	180	108	144	175	108	77	116	96	1,801	824	977
25	25	11	1999/00				52	50	50	99	125	100	110	210	150	120	224	210	108	153	194	108	2,063	824	1,239
25	25	11	2000/01				52	50	50	99	125	100	110	175	150	132	240	175	120	238	233	108	2,157	824	1,333
25	25	11	2001/02				52	50	50	99	125	100	110	175	150	132	200	175	132	255	194	120	2,119	824	1,295
25	25	11	2002/03				52	50	50	99	125	100	110	175	150	132	200	175	132	213	194	132	2,089	824	1,265
25	25	11	2003/04				52	50	50	99	125	100	110	175	150	132	200	175	132	213	194	132	2,089	824	1,265
25	25	11	2004/05				52	50	50	99	125	100	110	175	150	132	200	175	132	213	194	132	2,089	824	1,265
25	25	11	2005/06				52	50	50	99	125	100	110	175	150	132	200	175	132	213	194	132	2,089	824	1,265
25	25	11	2006/07				52	50	50	99	125	100	110	175	150	132	200	175	132	213	194	132	2,089	824	1,265
			2007/08					50	50	99	125	100	110	175	150	132	200	175	132	213	194	132	2,036	796	1,241
			2008/09								125	100	110	175	150	132	200	175	132	213	194	132	1,837	710	1,128
			2009/10											175	150	132	200	175	132	213	194	132	1,502	576	927
			2010/11														200	175	132	213	194	132	1,045	398	648
			2011/12																	213	194	132	538	204	335

Production of Manzanas Renovated or With Improved Cultural Practices in Year (columns 1991–1996).

Source: Tables 2, 3, 4 and 17.

Note: Each column reflects the production obtained from the manzanas renovated that year. For Example, column headed "1992 partial", the first number is 10. This is the product of 5 quintals per manzana (first column) times 2000 manzanas (fourth column) divided by 1,000. The last column, headed "TOTAL") is a sum of all the production generated by the manzanas renovated in different years.

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Table 19. Economic Cost of Coffee Production - Total Renovation - Without Project. (US$1,000)

Unit Costs	Year	No. of Hzs.	1991	Costs of Hanzanas Renovated in Year 1992	1993	1994	1995	1996	Total
261	1991/92	0	0						0
256	1992/93	2,000	0	521					521
261	1993/94	4,000	0	512	1,043				1,555
256	1994/95	6,000	0	521	1,023	1,566			3,109
256	1995/96	7,000	0	512	1,043	1,535	1,825		4,915
261	1996/97	7,750	0	512	1,023	1,566	1,791	2,021	6,911
261	1997/98		0	521	1,023	1,535	1,825	1,983	6,888
261	1998/99		0	521	1,043	1,535	1,791	2,021	6,911
261	1999/20		0	521	1,043	1,566	1,791	1,983	6,905
261	2000/01		0	521	1,043	1,566	1,825	1,983	6,937
261	2001/02		0	521	1,043	1,566	1,825	2,021	6,975
261	2002/03		0	521	1,043	1,566	1,825	2,021	6,975
261	2003/04		0	521	1,043	1,566	1,825	2,021	6,975
261	2004/05		0	521	1,043	1,566	1,825	2,021	6,975
261	2005/06		0	521	1,043	1,566	1,825	2,021	6,975
243	2006/07		0	521	1,043	1,566	1,825	2,021	6,975
	2007/08			487	1,043	1,566	1,825	2,021	6,940
	2008/09				973	1,566	1,825	2,021	6,385
	2009/10					1,460	1,825	2,021	5,306
	2010/11						1,703	2,021	3,724
	2011/12							1,886	1,886

Source: Table 10.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 20. Economic Cost of Coffee Production - Total Renovation - Net
(US$1,000)

Cost/ Mz.	Year	No. of Mzs.	Cost of Manzanas Renovated in Year 1991	1992	1993	1994	1995	1996	Total	Without Projec	Net	Additional Working Capital	TOTAL
1,902	1991/92		0						0	0	0		0
418	1992/93	2,000	0	3,804					3,804	521	3,282		3,282
697	1993/94	4,000	0	836	7,607				8,443	1,555	6,888	0	6,888
997	1994/95	6,000	0	1,394	1,671	11,611			14,673	3,109	11,366	785	12,151
1,136	1995/96	7,000	0	1,995	2,787	2,507	13,313		20,601	4,915	15,686	2,181	17,866
1,026	1996/97	7,750	0	2,272	3,989	4,181	2,924	14,739	28,105	6,911	21,194	3,854	25,048
1,026	1997/98		0	2,053	4,545	5,986	4,877	3,238	20,696	6,888	13,808	4,906	18,714
1,026	1998/99		0	2,053	4,105	6,817	6,981	5,400	25,336	6,911	18,445	5,554	23,998
1,026	1999/20		0	2,053	4,105	6,158	7,953	7,729	27,998	6,903	21,096	2,651	23,747
1,026	2000/01		0	2,053	4,105	6,158	7,185	8,805	28,306	6,937	21,369	274	21,643
1,026	2001/02		0	2,053	4,105	6,158	7,185	7,954	27,455	6,975	20,480	(889)	19,592
1,026	2002/03		0	2,053	4,105	6,158	7,185	7,954	27,455	6,975	20,480	0	20,480
1,026	2003/04		0	2,053	4,105	6,158	7,185	7,954	27,455	6,975	20,480	0	20,480
1,026	2004/05		0	2,053	4,105	6,158	7,185	7,954	27,455	6,975	20,480	0	20,480
1,026	2005/06		0	2,053	4,105	6,158	7,185	7,954	27,455	6,975	20,480	0	20,480
1,026	2006/07		0	2,053	4,105	6,158	7,185	7,954	27,455	6,975	20,480	0	20,480
	2007/08			2,053	4,105	6,158	7,185	7,954	27,455	6,940	20,515	(1,444)	19,071
	2008/09				4,105	6,158	7,185	7,954	25,402	6,383	19,019	(2,888)	16,131
	2009/10					6,158	7,185	7,954	21,297	5,306	15,991	(4,332)	11,659
	2010/11						7,185	7,954	15,139	3,724	11,415	(5,054)	6,361
	2011/12							7,954	7,954	1,886	6,069	(5,596)	473

Source: Tables 7 and 19.

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Table 21. Economic Cost of Coffee Production - Partial Renev
Without Project. (US$1,000)

Unit Cost	Year	Number of Manzan	1991	Costs of Manzanas Renewed in Year 1992	1993	1994	1995	1996	Total
437	1991/92	0	0						
411	1992/93	2,000	0	875					0
433	1993/94	5,000	0	822	2,187				875
414	1994/95	7,000	0	865	2,056	3,062			3,009
435	1995/96	8,000	0	829	2,163	2,878	3,499		5,983
438	1996/97	8,500	0	870	2,071	3,029	3,289	3,718	9,369
438	1997/98		0	876	2,175	2,900	3,461	3,495	12,977
438	1998/99		0	876	2,191	3,045	3,314	3,678	12,987
438	1999/20		0	876	2,191	3,067	3,480	3,521	13,104
438	2000/01		0	876	2,191	3,067	3,505	3,698	13,135
438	2001/02		0	876	2,191	3,067	3,505	3,724	13,336
438	2002/03		0	876	2,191	3,067	3,505	3,724	13,363
178	2003/04		0	876	2,191	3,067	3,505	3,724	13,363
178	2004/05		0	356	2,191	3,067	3,505	3,724	13,363
178	2005/06		0	356	890	3,067	3,505	3,724	12,843
161	2004/07		0	356	890	1,246	3,505	3,724	11,342
	2007/08			321	890	1,246	1,424	3,724	9,721
	2008/09				803	1,246	1,424	1,513	7,685
	2009/10					1,124	1,424	1,513	4,986
	2010/11						1,284	1,513	4,061
	2011/12							1,345	2,797
									1,345

Source: Table 11.

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EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 22. Economic Cost of Coffee Production - Partial Renovation - Net
(US$1,000)

Cost/ Mz.	Year	No. of Mzs.	Cost of Manzanas Renovated in Year 1991	1992	1993	1994	1995	1996	Total	Withot Project	Net	Work. Cap.	TOTAL
718	1991/92		0						0	0	0		0
388	1992/93	2,000	0	1,437					1,437	875	562		562
493	1993/94	5,000	0	777	3,592				4,369	3,009	1,360	0	1,360
644	1994/95	7,000	0	987	1,941	5,029			7,958	5,983	1,975	109	2,084
920	1995/96	8,000	0	1,292	2,467	2,718	5,748		12,224	9,349	2,856	616	3,472
973	1996/97	8,500	0	1,840	3,231	3,454	3,106	6,107	17,739	12,977	4,761	1,745	6,506
875	1997/98		0	1,945	4,600	4,524	3,948	3,300	18,317	12,907	5,410	3,000	8,410
875	1998/99		0	1,750	4,864	6,440	5,170	4,195	22,418	13,104	9,314	3,658	12,972
875	1999/20		0	1,750	4,375	6,809	7,360	5,493	25,787	13,135	12,652	3,337	15,989
875	2000/01		0	1,750	4,375	6,125	7,782	7,820	27,852	13,336	14,515	1,864	16,379
875	2001/02		0	1,750	4,375	6,125	7,000	8,268	27,518	13,363	14,155	(360)	13,795
875	2002/03		0	1,750	4,375	6,125	7,000	7,437	26,687	13,363	13,324	(831)	12,493
875	2003/04		0	1,750	4,375	6,125	7,000	7,437	26,687	13,363	13,324	0	13,324
875	2004/05		0	1,750	4,375	6,125	7,000	7,437	26,687	12,843	13,844	520	14,365
875	2005/06		0	1,750	4,375	6,125	7,000	7,437	26,687	11,542	15,145	1,301	16,446
875	2006/07		0	1,750	4,375	6,125	7,000	7,437	26,687	9,721	16,966	1,821	18,787
	2007/08			1,750	4,375	6,125	7,000	7,437	26,687	7,605	19,082	699	19,781
	2008/09				4,375	6,125	7,000	7,437	24,937	4,986	19,951	(1,243)	18,708
	2009/10					6,125	7,000	7,437	20,562	4,061	16,501	(4,836)	11,665
	2010/11						7,000	7,437	14,437	2,797	11,640	(5,527)	6,113
	2011/12							7,437	7,437	1,365	6,073	(5,873)	200

Source: Tables 8 and 21.

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EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 23. Economic Cost of Coffee Production - Improved Cultural Practices - Without Project. (US$1,000)

Unit Costs	Year	No. of Mzs.	Costs of Manzanas Renovated in Year 1991	1992	1993	1994	1995	1996	Total
261	1991/92	4,750	1,239						1,239
256	1992/93	9,000	1,215	2,347					3,562
261	1993/94	10,000	1,239	2,303	2,607				6,149
256	1994/95	12,000	1,215	2,347	2,559	3,129			9,249
256	1995/96	12,000	1,215	2,303	2,607	3,070	3,129		12,324
261	1996/97	12,000	1,239	2,303	2,559	3,129	3,070	3,129	15,428
261	1997/98		1,239	2,347	2,559	3,070	3,129	3,070	15,413
261	1998/99		1,239	2,347	2,607	3,070	3,070	3,129	15,442
261	1999/20		1,239	2,347	2,607	3,129	3,070	3,070	15,462
261	2000/01		1,239	2,347	2,607	3,129	3,129	3,070	15,520
261	2001/02		1,239	2,347	2,607	3,129	3,129	3,129	15,579
261	2002/03		1,239	2,347	2,607	3,129	3,129	3,129	15,579
261	2003/04		1,239	2,347	2,607	3,129	3,129	3,129	15,579
261	2004/05		1,239	2,347	2,607	3,129	3,129	3,129	15,579
261	2005/06		1,239	2,347	2,607	3,129	3,129	3,129	15,579
243	2006/07		1,156	2,347	2,607	3,129	3,129	3,129	15,496
	2007/08			2,190	2,607	3,129	3,129	3,129	14,184
	2008/09				2,433	3,129	3,129	3,129	11,820
	2009/10					2,920	3,129	3,129	9,177
	2010/11						2,920	3,129	6,048
	2011/12							2,920	2,920

Source: Table 10.

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Table 24. Economic Cost of Coffee Production - Improved Cultural Practices - Net
(US$1,000)

Cost/ Mz.	Year	No. of Mzs.	Cost of Manzanas Renovated in Year 1991	1992	1993	1994	1995	1996	Total	Without Project	Net	Additional Working Capital	TOTAL
466	1991/92	4,750	2,215						2,215	1,239	976		976
438	1992/93	9,000	2,079	4,196					6,275	3,562	2,713		2,713
489	1993/94	10,000	2,322	3,939	4,662				10,923	6,149	4,775	975	5,750
463	1994/95	12,000	2,199	4,399	4,377	5,595			16,570	9,249	7,321	1,748	9,069
496	1995/96	12,000	2,355	4,167	4,888	5,252	5,595		22,257	12,324	9,933	2,021	11,954
530	1996/97	12,000	2,520	4,463	4,630	5,866	5,252	5,595	28,325	15,428	12,898	2,691	15,589
538	1997/98		2,554	4,776	4,959	5,556	5,866	5,252	28,961	15,413	13,548	2,842	16,390
538	1998/99		2,554	4,838	5,305	5,951	5,556	5,866	30,069	15,462	14,607	2,968	17,575
538	1999/20		2,554	4,838	5,376	6,366	5,951	5,556	30,640	15,462	15,178	571	15,749
538	2000/01		2,554	4,838	5,376	6,451	6,366	5,951	31,535	15,520	16,015	837	16,851
538	2001/02		2,554	4,838	5,376	6,451	6,451	6,366	32,035	15,579	16,456	442	16,898
538	2002/03		2,554	4,838	5,376	6,451	6,451	6,451	32,121	15,579	16,542	86	16,627
538	2003/04		2,554	4,838	5,376	6,451	6,451	6,451	32,121	15,579	16,542	0	16,542
538	2004/05		2,554	4,838	5,376	6,451	6,451	6,451	32,121	15,579	16,542	0	16,542
538	2005/06		2,554	4,838	5,376	6,451	6,451	6,451	32,121	15,579	16,542	0	16,542
538	2006/07		2,554	4,838	5,376	6,451	6,451	6,451	32,121	15,496	16,625	(1,207)	15,418
	2007/08			4,838	5,376	6,451	6,451	6,451	29,567	14,184	15,384	(2,286)	13,097
	2008/09				5,376	6,451	6,451	6,451	24,729	11,820	12,910	(2,540)	10,369
	2009/10					6,451	6,451	6,451	19,353	9,177	10,176	(3,049)	7,127
	2010/11						6,451	6,451	12,902	6,048	6,854	(3,049)	3,805
	2011/12							6,451	6,451	2,920	3,532	(3,049)	483

Source: Tables 9 and 23.

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Table 25. Economic Internal Rate of Return.

Year	Project Overhead Cost (US$1,000)	Additional Production (1,000 qq)	Price (US$/qq) (1)	(2)	(3)	Economic Revenue (1)	(2)	(3) (US$1,000)	Additional Cost & Working Capital: Partial	Total (US$1,000)	ICP	All	Net Income (1)	(2)	(3) (US$1,000)
1991/92	5,238	0	91	68	54	0	0	0	0	0	976	976	(6,214)	(6,214)	(6,21
1992/93	4,479	(13)	90	67	54	(1,119)	(839)	(671)	542	3,282	2,713	6,537	(12,155)	(11,875)	(11,70
1993/94	2,640	(30)	97	73	58	(2,868)	(2,151)	(1,721)	1,360	6,888	5,750	13,997	(19,506)	(18,789)	(18,35
1994/95	1,833	(22)	106	80	64	(2,312)	(1,734)	(1,387)	2,084	12,151	9,069	23,304	(27,449)	(26,871)	(26,52
1995/96	1,810	61	108	81	65	6,634	4,975	3,980	3,472	17,866	11,954	33,292	(28,468)	(30,127)	(31,12
1996/97		251	108	81	65	27,186	20,389	16,311	6,506	25,048	15,589	47,143	(19,957)	(26,754)	(30,83
1997/98		630	108	81	65	68,181	51,136	40,909	8,410	18,716	16,390	43,513	24,668	7,623	(2,60
1998/99		977	108	81	65	105,819	79,364	63,491	12,972	23,998	17,575	54,545	51,273	24,819	8,94
1999/00		1,239	108	81	65	134,196	100,647	80,518	15,989	23,747	15,749	55,485	78,711	45,162	25,03
2000/01		1,333	108	81	65	144,330	108,243	86,610	16,379	21,643	16,851	54,873	89,477	53,390	31,73
2001/02		1,295	108	81	65	140,261	105,196	84,157	13,795	19,592	16,898	50,285	89,976	54,911	33,87
2002/03		1,265	108	81	65	136,958	102,718	82,175	12,493	20,480	16,627	49,601	87,357	53,117	32,57
2003/04		1,265	108	81	65	136,958	102,718	82,175	13,324	20,480	16,542	50,347	86,611	52,372	31,82
2004/05		1,265	108	81	65	136,958	102,718	82,175	14,348	20,480	16,542	51,387	85,571	51,331	30,78
2005/06		1,265	108	81	65	136,958	102,718	82,175	16,446	20,480	16,542	53,468	83,490	49,250	28,70
2006/07		1,265	108	81	65	136,958	102,718	82,175	18,787	20,480	15,418	54,685	82,273	48,033	27,48
2007/08		1,241	108	81	65	134,386	100,789	80,631	19,781	19,071	13,097	51,950	82,436	48,539	28,68
2008/09		1,128	108	81	65	122,147	91,610	73,288	18,708	16,131	10,369	45,208	76,939	44,432	28,08
2009/10		927	108	81	65	100,376	75,282	60,226	11,445	11,659	7,127	30,432	69,925	44,531	29,77
2010/11		648	108	81	65	70,158	52,618	42,095	6,113	6,361	3,805	16,279	53,879	36,340	25,81
2011/12		335	108	81	65	36,257	27,193	21,754	200	473	483	1,156	35,101	26,037	20,59
Economic Internal Rate of Return													30.4%	20.5%	12.1

Source: Tables 10, 14, 16 and 18.

Note: It should be noted that this is the prices received by the country, not the exporter. The exporter has to pay export taxes, which is a benefit to the economy. The price has been adjusted to reflect the cost of the SCC and ISIC.

Price (2) = 0.75 x Price (1)
Price (3) = 0.6 x Price (1)

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Table 26. Labor Use Without the Project, 1991/92 to 2011/12.

Man-Days				Number of Hzs. Renovated			Person-Years Used in Manzanas Renovated or With Improved Cultural Practices in Year																					
							1991	1992			1993			1994			1995			1996								
Per	Tot	ICP	Year	Per.	Total	ICP	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	TOTAL
67	48	48	1991/92	0	0	4,750	920																					920
67	48	48	1992/93	2,000	2,000	9,000	920	533	387	1,742																		3,582
67	48	48	1993/94	5,000	4,000	10,000	920	536	387	1,742	1,333			774	1,936													7,629
67	48	48	1994/95	7,000	6,000	12,000	920	536	387	1,742	1,341			774	1,936	1,866	1,162	2,323										12,987
67	48	48	1995/96	8,000	7,000	12,000	920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,132	1,355	2,323							18,809
67	48	48	1996/97	8,500	7,750	12,000	920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,266	1,500	2,323	24,911
67	48	48	1997/98				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	1998/99				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	1999/00				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2000/01				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2001/02				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2002/03				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2003/04				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2004/05				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2005/06				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
67	48	48	2006/07				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
			2007/08				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
			2008/09				920	536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,924
			2009/10					536	387	1,742	1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	24,005
			2010/11								1,341			774	1,936	1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	21,339
			2011/12													1,877	1,162	2,323	2,145	1,355	2,323	2,279	1,500	2,323	17,288
																			2,145	1,355	2,323	2,279	1,500	2,323	11,926
																						2,279	1,500	2,323	6,103

Source: Tables 10 and 11.

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Table 27. Additional Labor Generated Due to Project, 1991/92 to 2011/12.

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Man-Days				Number of Mzs. Renovated			Person-Years Used in Manzanas Renovated or With Improved Cultural Practicesin Year																		
							1991	1992			1993			1994			1995			1996				Without	
Par	Tot	ICP	Year	Par.	Total	ICP	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	TOTAL	Project	Net
124	395	92	1991/92	0	0	4,750	1,742																1,742	920	823
80	56	80	1992/93	2,000	2,000	9,800	1,525	995		3,301													5,822	3,582	2,239
114	82	114	1993/94	5,000	4,000	10,000	2,162	640	447	2,890	2,488		3,668										12,295	7,629	4,666
85	94	75	1994/95	7,000	6,000	12,000	1,416	912	660	4,096	1,600	895	3,211	3,484		4,402							20,674	12,987	7,687
116	116	91	1995/96	8,000	7,000	12,000	1,720	681	754	2,684	2,281	1,319	4,551	2,240	1,342	3,853	3,981		4,402				29,807	18,809	10,999
125	110	98	1996/97	8,500	7,750	12,000	1,859	927	926	3,260	1,702	1,509	2,982	3,193	1,979	5,661	2,559	1,566	3,853	4,230		4,402	40,407	24,911	15,496
113	110	91	1997/98				1,731	996	882	3,522	2,319	1,851	3,622	2,383	2,263	3,578	3,650	2,309	5,461	2,719	1,733	3,855	42,872	24,924	17,948
113	110	91	1998/99				1,731	901	882	3,280	2,490	1,765	3,913	3,246	2,777	4,346	2,723	2,640	3,578	3,878	2,556	5,461	46,168	24,924	21,242
113	110	91	1999/00				1,731	901	882	3,280	2,252	1,765	3,645	3,486	2,647	4,696	3,710	3,240	4,346	2,893	2,923	3,578	45,974	24,924	21,050
113	110	91	2000/01				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,984	3,088	4,696	3,942	3,587	4,346	48,271	24,924	23,346
113	110	91	2001/02				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	4,233	3,419	4,696	48,040	24,924	23,115
113	110	91	2002/03				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	47,312	24,924	22,388
113	110	91	2003/04				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	47,312	24,924	22,388
113	110	91	2004/05				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	47,312	24,924	22,388
113	110	91	2005/06				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	47,312	24,924	22,388
113	110	91	2006/07				1,731	901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	47,312	24,924	22,388
			2007/08					901	882	3,280	2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	45,581	24,005	21,576
			2008/09								2,252	1,765	3,645	3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	40,518	21,339	19,179
			2009/10											3,152	2,647	4,374	3,603	3,088	4,374	3,828	3,419	4,374	32,857	17,288	15,569
			2010/11														3,603	3,088	4,374	3,828	3,419	4,374	22,684	11,926	10,758
			2011/12																	3,828	3,419	4,374	11,620	6,103	5,517

Source: Tables 7, 8, 9 and 26.

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Table 28. Foreign Exchange Used Without the Project, 1991/92 to 2011/12.

US$ per Mz.				Number of Mzs. Renovated			US$1,000 Used in Manzanas Renovated or With Improved Cultural Practices in Year																		
							1991	1992		1993			1994			1995			1996						
Per	Tot	ICP	Year	Per.	Total	ICP	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	TOTAL
75	35	35	1991/92	0	0	4,750	166																		166
59	32	32	1992/93	2,000	2,000	9,000	152	150	70	315															687
72	35	35	1993/94	5,000	4,000	10,000	166	119	64	289	376	140	349												1,503
61	32	32	1994/95	7,000	6,000	12,000	152	144	70	315	297	128	321	526	210	419									2,582
73	32	32	1995/96	8,000	7,000	12,000	152	122	64	289	360	140	349	416	193	385	601	245	419						3,735
75	35	35	1996/97	8,500	7,750	12,000	166	147	64	289	306	128	321	503	210	419	475	225	385	638	271	419			4,967
75	35	35	1997/98				166	150	70	315	366	128	321	428	193	385	575	245	419	505	249	385			4,900
75	35	35	1998/99				166	150	70	315	376	140	349	513	193	385	490	225	385	611	271	419			5,057
75	35	35	1999/00				166	150	70	315	376	140	349	526	210	419	586	225	385	520	249	385			5,070
75	35	35	2000/01				166	150	70	315	376	140	349	526	210	419	601	245	419	623	249	385			5,242
75	35	35	2001/02				166	150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,313
75	35	35	2002/03				166	150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,313
75	35	35	2003/04				166	150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,313
75	35	35	2004/05				166	150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,313
75	35	35	2005/06				166	150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,313
75	35	35	2006/07				166	150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,313
			2007/08					150	70	315	376	140	349	526	210	419	601	245	419	638	271	419			5,147
			2008/09								376	140	349	526	210	419	601	245	419	638	271	419			4,613
			2009/10											526	210	419	601	245	419	638	271	419			3,748
			2010/11														601	245	419	638	271	419			2,593
			2011/12																	638	271	419			1,329

Source: Tables 10 and 11.

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Table 29. Additional Foreign Exchange Used Due to Project, 1991/92 to 2011/12.

US$ per Mz.				Number of Mzs. Renovated			US$1,000 Used in Manzanas Renovated or With Improved Cultural Practices in Year																		1,000		
							1991			1992			1993			1994			1995			1996					
Per	Tot	ICP	Year	Per.	Total	ICP	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	TOTAL	Without Projec	Net
213	605	90	1991/92	0	0	4,750	425																425	166	259
65	125	83	1992/93	2,000	2,000	9,000	394	426		806													1,625	687	938
68	151	77	1993/94	5,000	4,000	10,000	365	131	250	747	1,064		895										3,451	1,503	1,949
91	201	92	1994/95	[illegible]	[illegible]	12,000	439	137	303	691	327	500	830	1,489		1,074							5,790	2,582	3,208
108	205	93	1995/96	[illegible]	[illegible]	12,000	443	181	401	832	342	605	768	457	751	996	1,782		1,074				8,552	3,735	4,817
108	201	95	1996/97	[illegible]	[illegible]	12,000	450	216	410	840	453	803	924	479	908	921	522	876	996	1,808		1,074	11,679	4,967	6,712
117	201	95	1997/98				452	215	401	852	539	819	933	634	1,204	1,109	547	1,059	921	555	978	996	12,207	4,900	7,307
117	201	95	1998/99				452	235	401	856	538	803	947	755	1,229	1,120	725	1,405	1,109	581	1,173	921	13,248	5,057	8,191
117	201	95	1999/00				452	235	401	856	587	803	951	754	1,204	1,136	863	1,433	1,120	770	1,555	1,109	14,228	5,070	9,158
117	201	95	2000/01				452	235	401	856	587	803	951	822	1,204	1,141	861	1,405	1,136	917	1,587	1,120	14,477	5,242	9,235
117	201	95	2001/02				452	235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	915	1,555	1,136	14,543	5,313	9,229
117	201	95	2002/03				452	235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	14,630	5,313	9,317
117	201	95	2003/04				452	235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	14,630	5,313	9,317
117	201	95	2004/05				452	235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	14,630	5,313	9,317
117	201	95	2005/06				452	235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	14,630	5,313	9,317
117	201	95	2006/07				452	235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	14,630	5,313	9,317
			2007/08					235	401	856	587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	14,178	5,147	9,031
			2008/09								587	803	951	822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	12,687	4,613	8,074
			2009/10											822	1,204	1,141	939	1,405	1,141	998	1,555	1,141	10,346	3,748	6,598
			2010/11														939	1,405	1,141	998	1,555	1,141	7,179	2,593	4,586
			2011/12																	998	1,555	1,141	3,694	1,329	2,366

Source: Tables 7, 8, 9 and 28.

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Table 30. Domestic Resources Used Without the Project, 1991/92 to 2011/12.

US$ per Mz.				Number of Mzs. Renovated			US$1,000 Used in Manzanas Renovated or With Improved Cultural Practicesin Year																		
							1991	1992		1993			1994			1995			1996						
Per	Tot	ICP	Year	Per.	Total	ICP	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	TOTAL
417	261	261	1991/92	0	0	4,750	1,241																		1,241
406	259	259	1992/93	2,000	2,000	9,000	1,230	834	522	2,351															4,937
415	261	261	1993/94	5,000	4,000	10,000	1,241	812	518	2,331	2,084	1,045	2,612												10,643
407	259	259	1994/95	7,000	6,000	12,000	1,230	831	522	2,351	2,029	1,036	2,590	2,918	1,567	3,134									18,209
416	259	259	1995/96	8,000	7,000	12,000	1,230	815	518	2,331	2,076	1,045	2,612	2,841	1,554	3,109	3,335	1,828	3,134						26,429
418	261	261	1996/97	8,500	7,750	12,000	1,241	833	518	2,331	2,036	1,036	2,590	2,907	1,567	3,134	3,247	1,813	3,109	3,543	2,024	3,134	35,064
418	261	261	1997/98				1,241	835	522	2,351	2,082	1,036	2,590	2,851	1,554	3,109	3,322	1,828	3,134	3,450	2,008	3,109	35,022
418	261	261	1998/99				1,241	835	522	2,351	2,088	1,045	2,612	2,914	1,554	3,109	3,258	1,813	3,109	3,530	2,024	3,134	35,139
418	261	261	1999/00				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,330	1,813	3,109	3,462	2,008	3,109	35,149
418	261	261	2000/01				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,539	2,024	3,134	35,278
418	261	261	2001/02				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
418	261	261	2002/03				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
418	261	261	2003/04				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
418	261	261	2004/05				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
418	261	261	2005/06				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
418	261	261	2006/07				1,241	835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
			2007/08					835	522	2,351	2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	35,332
			2008/09								2,088	1,045	2,612	2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	34,091
			2009/10											2,924	1,567	3,134	3,341	1,828	3,134	3,550	2,024	3,134	30,383
			2010/11														3,341	1,828	3,134	3,550	2,024	3,134	24,638
			2011/12																	3,550	2,024	3,134	17,013
																							8,709

Source: Tables 10 and 11.

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Table 31. Additional Domestic Resource Used Due to Project, 1991/92 to 2011/12.

US$ per Mz.				Number of Mzs. Renovated			US$1,000 Used in Manzanas Renovated or With Improved Cultural Practicesin Year																		1,000		
							1991	1992				1993			1994			1995			1996						
Par	Tot	ICP	Year	Par.	Total	ICP	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	TOTAL	Without Project	Net
571	1,457	430	1991/92	0	0	4,750	2,040																2,040	1,241	800
373	331	408	1992/93	2,000	2,000	9,000	1,940	1,143		3,866													6,949	4,937	2,012
493	623	477	1993/94	5,000	4,000	10,000	2,267	746	662	3,676	2,857		4,296										14,503	10,643	3,860
640	909	426	1994/95	7,000	6,000	12,000	2,021	986	1,245	4,294	1,866	1,324	4,085	3,999		5,155							24,975	18,209	6,766
937	1,065	463	1995/96	8,000	7,000	12,000	2,200	1,280	1,817	3,830	2,465	2,490	4,772	2,412	1,986	4,901	4,571		5,155				38,079	26,429	11,650
998	943	502	1996/97	8,500	7,750	12,000	2,384	1,873	2,131	4,169	3,201	3,634	4,256	3,451	3,736	5,726	2,985	2,317	4,901	4,856		5,155	54,773	35,064	19,709
873	943	509	1997/98				2,418	1,997	1,886	4,516	4,683	4,261	4,632	4,481	5,452	5,107	3,943	4,358	5,726	3,172	2,565	4,901	64,099	35,022	29,078
873	943	509	1998/99				2,418	1,745	1,886	4,582	4,992	3,773	5,018	6,557	6,392	5,558	5,121	6,360	5,107	4,190	4,825	5,726	74,251	35,139	39,112
873	943	509	1999/00				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,989	5,659	6,022	7,493	7,457	5,558	5,441	7,042	5,107	80,628	35,149	45,479
873	943	509	2000/01				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	7,987	6,603	6,022	7,962	8,256	5,558	84,125	35,278	48,847
873	943	509	2001/02				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	8,486	7,310	6,022	83,249	35,332	47,918
873	943	509	2002/03				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	82,269	35,332	46,937
873	943	509	2003/04				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	82,269	35,332	46,937
873	943	509	2004/05				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	82,269	35,332	46,937
873	943	509	2005/06				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	82,269	35,332	46,937
873	943	509	2006/07				2,418	1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	82,269	35,332	46,937
			2007/08					1,745	1,886	4,582	4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	82,269	35,332	46,937
			2008/09								4,363	3,773	5,091	6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	79,850	34,091	45,760
			2009/10											6,109	5,659	6,109	6,982	6,603	6,109	7,418	7,310	6,109	71,636	30,383	41,254
			2010/11														6,982	6,603	6,109	7,418	7,310	6,109	58,409	24,638	33,771
			2011/12																	7,418	7,310	6,109	40,531	17,013	23,519
																							20,837	8,709	12,129

Source: Tables 7, 8, 9 and 30.

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Table 32. Net Generation of Foreign Exchange and Use of Domestic Resources Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Use of Project F.X. US$1,000	Invest.	NET F.X.	Domestic Resources Prod.	Invest	Total
1991/92	0	92	0	259	3,929	(4,188)	800	1,309	2,109
1992/93	(13)	91	(1,136)	938	2,968	(5,043)	2,012	1,511	3,523
1993/94	(30)	99	(2,912)	1,949	1,122	(5,983)	3,860	1,518	5,378
1994/95	(22)	108	(2,347)	3,208	262	(5,816)	6,766	1,571	8,337
1995/96	61	110	6,732	4,817	172	1,743	11,650	1,638	13,288
1996/97	251	110	27,587	6,712		20,875	19,709		19,709
1997/98	630	110	69,188	7,307		61,881	29,078		29,078
1998/99	977	110	107,381	8,191		99,190	39,112		39,112
1999/00	1,239	110	136,177	9,158		127,020	45,479		45,479
2000/01	1,333	110	146,481	9,235		137,246	48,847		48,847
2001/02	1,295	110	142,332	9,229		133,103	47,918		47,918
2002/03	1,265	110	138,980	9,317		129,663	46,937		46,937
2003/04	1,265	110	138,980	9,317		129,663	46,937		46,937
2004/05	1,265	110	138,980	9,317		129,663	46,937		46,937
2005/06	1,265	110	138,980	9,317		129,663	46,937		46,937
2006/07	1,265	110	138,980	9,317		129,663	46,937		46,937
2007/08	1,241	110	136,370	9,331		127,339	45,760		45,760
2008/09	1,128	110	123,950	8,074		115,876	41,254		41,254
2009/10	927	110	101,858	6,598		95,260	33,771		33,771
2010/11	648	110	71,194	4,586		66,608	23,519		23,519
2011/12	335	110	36,792	2,366		34,426	12,129		12,129
SUM						1,347,854			453,896
AVERAGE						78,469			31,138
NET PRESENT VALUE AT 15% DISCOUNT						276,722			132,806
Domestic Cost of Generating One Dollar									0.48

Source: Tables 12, 18, 29, and 31.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 33. Intermediate Goods Used Without the Project, 1991/92 to 2011/12.

US$ per Mz.				Number of Mzs. Renovated			US$1,000 Used in Manzanas Renovated or With Improved Cultural Practices in Year																		
							1991	1992		1993			1994			1995			1996						
Per	Tot	ICP	Year	Per.	Total	ICP	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	Per.	Tot.	ICP	TOTAL
124	66	66	1991/92	0	0	4,750	314																		314
113	61	61	1992/93	2,000	2,000	9,000	292	249	132	595															1,268
119	66	66	1993/94	5,000	4,000	10,000	316	225	123	553	621	265	661												2,762
116	61	61	1994/95	7,000	6,000	12,000	292	238	132	595	563	246	614	870	397	794									4,740
121	61	61	1995/96	8,000	7,000	12,000	292	231	123	553	595	265	661	789	368	737	994	463	794						6,863
124	66	66	1996/97	8,500	7,750	12,000	314	242	123	553	579	246	614	833	397	794	901	430	737	1,056	513	794			9,123
124	66	66	1997/98				314	249	132	595	606	246	614	810	368	737	952	463	794	958	476	737			9,049
124	66	66	1998/99				314	249	132	595	621	265	661	849	397	794	926	430	737	1,011	513	794			9,200
124	66	66	1999/00				314	249	132	595	621	265	661	870	397	794	970	463	794	984	476	737			9,230
124	66	66	2000/01				314	249	132	595	621	265	661	870	397	794	994	463	794	1,030	476	737			9,391
124	66	66	2001/02				314	249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,511
124	66	66	2002/03				314	249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,511
124	66	66	2003/04				314	249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,511
124	66	66	2004/05				314	249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,511
124	66	66	2005/06				314	249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,511
124	66	66	2006/07				314	249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,511
			2007/08					249	132	595	621	265	661	870	397	794	994	463	794	1,056	513	794			9,197
			2008/09								621	265	661	870	397	794	994	463	794	1,056	513	794			8,221
			2009/10											870	397	794	994	463	794	1,056	513	794			6,673
			2010/11														994	463	794	1,056	513	794			4,613
			2011/12																	1,056	513	794			2,362

Source: Tables 10 and 11.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 34. Additional Intermediate Goods Used Due to Project, 1991/92 to 2011/12.

US$ per Mz.				Number of Mzs. Renovated			US$1,000 Used in Manzanas Renovated or With Improved Cultural Practices in Year																					1,000		
							1991			1992			1993			1994			1995			1996							
Par	Tot	ICP	Year	Par.	Total	ICP	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	Par.	Tot.	ICP	TOTAL	Without Projec	Net
235	707	175	1991/92	0	0	4,750	845																					845	314	531
118	201	129	1992/93	2,000	2,000	9,000	613	469		1,600																		2,683	1,268	1,416
122	257	125	1993/94	5,000	4,000	10,000	591	236	482	1,162	1,174			1,778														5,343	2,762	2,581
170	359	152	1994/95	7,000	6,000	12,000	721	245	513	1,121	591	803	1,291	1,643		2,134												9,062	4,740	4,322
203	372	156	1995/96	8,000	7,000	12,000	739	341	718	1,367	612	1,026	1,245	827	1,205	1,549	1,878		2,134									13,641	6,863	6,778
220	359	159	1996/97	8,500	7,750	12,000	757	405	744	1,400	852	1,437	1,519	857	1,539	1,494	945	1,405	1,569	1,995		2,134						19,035	9,123	9,911
215	359	161	1997/98				767	440	718	1,435	1,014	1,488	1,556	1,193	2,155	1,822	980	1,796	1,494	1,004	1,556	1,549						20,968	9,049	11,919
215	359	161	1998/99				767	431	718	1,453	1,100	1,437	1,595	1,419	2,232	1,867	1,363	2,514	1,822	1,041	1,988	1,494						23,242	9,200	14,042
215	359	161	1999/00				767	431	718	1,453	1,077	1,437	1,614	1,540	2,155	1,913	1,622	2,605	1,867	1,449	2,784	1,822						25,253	9,230	16,023
215	359	161	2000/01				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,759	2,514	1,913	1,723	2,884	1,867						25,758	9,391	16,367
215	359	161	2001/02				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,869	2,784	1,913						25,839	9,511	16,328
215	359	161	2002/03				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						25,824	9,511	16,313
215	359	161	2003/04				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						25,824	9,511	16,313
215	359	161	2004/05				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						25,824	9,511	16,313
215	359	161	2005/06				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						25,824	9,511	16,313
215	359	161	2006/07				767	431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						25,057	9,197	15,861
			2007/08					431	718	1,453	1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						22,455	8,221	14,235
			2008/09								1,077	1,437	1,614	1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						18,327	6,673	11,654
			2009/10											1,508	2,155	1,937	1,724	2,514	1,937	1,832	2,784	1,937						12,727	4,613	8,114
			2010/11														1,724	2,514	1,937	1,832	2,784	1,937						6,552	2,362	4,190
			2011/12																	1,832	2,784	1,937								

Source: Tables 7, 8, 9 and 33.

SENSITIVITY ANALYSIS TABLES

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 35. Net Value Added to the Economy Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Net Int.	Use Good US$1,000	Investment	NET
1991/92	0	92	0	531			(531)
1992/93	(13)	91	(1,136)	1,416	2,712		160
1993/94	(30)	99	(2,912)	2,581	5,935		442
1994/95	(22)	108	(2,347)	4,322	9,157		2,489
1995/96	61	110	6,732	6,778	11,026		10,978
1996/97	251	110	27,587	9,911	12,296		29,972
1997/98	630	110	69,188	11,919	1,979		59,248
1998/99	977	110	107,381	14,042			93,340
1999/00	1,239	110	136,177	16,023			120,154
2000/01	1,333	110	146,481	16,367			130,115
2001/02	1,295	110	142,332	16,328			126,004
2002/03	1,265	110	138,980	16,313			122,667
2003/04	1,265	110	138,980	16,313			122,667
2004/05	1,265	110	138,980	16,313			122,667
2005/06	1,265	110	138,980	16,313			122,667
2006/07	1,265	110	138,980	16,313			122,667
2007/08	1,241	110	136,370	15,861			120,509
2008/09	1,128	110	123,950	14,235			109,715
2009/10	927	110	101,858	11,654			90,204
2010/11	648	110	71,194	8,116			63,080
2011/12	335	110	36,792	4,190			32,602
SUM							1,601,816
AVERAGE							76,277
NET PRESENT VALUE AT 15% DISCOUNT							286,350

Source: Tables 12, 18 and 34.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 32. Net Generation of Foreign Exchange and Use of Domestic Resources Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Use of Project F.X. US$1,000	Use of Project Invest.	NET F.X.	Domestic Resources Prod.	Domestic Resources Invest	Domestic Resources Total
1991/92	0	92	0	130	3,929	(4,059)	400	1,309	1,709
1992/93	(6)	91	(569)	469	2,968	(4,006)	1,006	1,511	2,517
1993/94	(15)	99	(1,456)	974	1,122	(3,553)	1,930	1,518	3,448
1994/95	(11)	108	(1,172)	1,604	262	(3,038)	3,383	1,571	4,954
1995/96	31	110	3,363	2,409	172	782	5,825	1,638	7,463
1996/97	126	110	13,781	3,356		10,425	9,855		9,855
1997/98	315	110	34,563	3,653		30,909	14,539		14,539
1998/99	489	110	53,642	4,096		49,547	19,556		19,556
1999/00	620	110	68,027	4,579		63,448	22,740		22,740
2000/01	666	110	73,175	4,618		68,557	24,424		24,424
2001/02	648	110	71,102	4,615		66,487	23,959		23,959
2002/03	632	110	69,427	4,658		64,769	23,469		23,469
2003/04	632	110	69,427	4,658		64,769	23,469		23,469
2004/05	632	110	69,427	4,658		64,769	23,469		23,469
2005/06	632	110	69,427	4,658		64,769	23,469		23,469
2006/07	632	110	69,427	4,658		64,769	23,469		23,469
2007/08	620	110	68,123	4,516		63,608	22,880		22,880
2008/09	564	110	61,919	4,037		57,882	20,627		20,627
2009/10	463	110	50,883	3,299		47,584	16,886		16,886
2010/11	324	110	35,565	2,293		33,272	11,759		11,759
2011/12	167	110	18,379	1,183		17,197	6,064		6,064
SUM						818,889			330,722
AVERAGE						38,995			15,749
NET PRESENT VALUE AT 15% DISCOUNT						134,901			68,899
Domestic Cost of Generating One Dollar									0.51

Source: Tables 12, 18, 29, and 31.

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Sensitivity Analysis A:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 25. Economic Internal Rate of Return.

Year	Project Overhead Cost (US$1,000)	Additional Production (1,000 qq)	Price (US$/qq) (1)	(2)	(3)	Economic Revenue (1)	(2)	(3)	Additional Cost & Working Capital: Partial	Total	ICP	All	Net Income (1)	(2)	(3)
						(US$1,000)			(US$1,000)				(US$1,000)		
1991/92	5,238	0	91	68	54	0	0	0	0	0	488	488	(5,726)	(5,726)	(5,726)
1992/93	4,479	(6)	90	67	54	(560)	(420)	(336)	281	1,641	1,357	3,279	(8,318)	(8,178)	(8,094)
1993/94	2,640	(15)	97	73	58	(1,434)	(1,076)	(861)	680	3,444	2,875	6,999	(11,073)	(10,714)	(10,499)
1994/95	1,833	(11)	106	80	64	(1,155)	(866)	(693)	1,042	6,075	4,534	11,652	(14,640)	(14,351)	(14,178)
1995/96	1,810	31	108	81	65	3,314	2,485	1,988	1,736	8,933	5,977	16,646	(15,142)	(15,971)	(16,468)
1996/97		126	108	81	65	13,581	10,185	8,148	3,253	12,524	7,794	23,571	(9,991)	(13,386)	(15,423)
1997/98		315	108	81	65	34,060	25,545	20,436	4,205	9,357	8,195	21,757	12,303	3,788	(1,321)
1998/99		489	108	81	65	52,862	39,646	31,717	6,486	11,999	8,787	27,273	25,589	12,373	4,444
1999/00		620	108	81	65	67,037	50,278	40,222	7,995	11,873	7,875	27,743	39,295	22,535	12,480
2000/01		666	108	81	65	72,110	54,082	43,266	8,189	10,821	8,426	27,436	44,673	26,646	15,829
2001/02		648	108	81	65	70,067	52,550	42,040	6,898	9,796	8,449	25,142	44,925	27,408	16,898
2002/03		632	108	81	65	68,417	51,313	41,050	6,247	10,240	8,314	24,801	43,616	26,512	16,250
2003/04		632	108	81	65	68,417	51,313	41,050	6,662	10,240	8,271	25,173	43,244	26,139	15,877
2004/05		632	108	81	65	68,417	51,313	41,050	7,182	10,240	8,271	25,694	42,723	25,619	15,357
2005/06		632	108	81	65	68,417	51,313	41,050	8,223	10,240	8,271	26,734	41,683	24,579	14,316
2006/07		632	108	81	65	68,417	51,313	41,050	9,393	10,240	7,709	27,343	41,074	23,970	13,707
2007/08		620	108	81	65	67,132	50,349	40,279	9,891	9,536	6,549	25,975	41,157	24,374	14,304
2008/09		564	108	81	65	61,018	45,763	36,611	9,354	8,065	5,185	22,604	38,414	23,160	14,607
2009/10		463	108	81	65	50,143	37,607	30,086	5,832	5,830	3,564	15,226	34,917	22,381	14,860
2010/11		324	108	81	65	35,047	26,285	21,028	3,056	3,180	1,903	8,139	26,908	18,146	12,889
2011/12		167	108	81	65	18,112	13,584	10,867	100	237	241	578	17,534	13,006	10,289
Economic Internal Rate of Return													27.1%	18.0%	10.4%

Source: Tables 10, 14, 16 and 18.

Note: It should be noted that this is the prices recieved by the country, not the exporter. The exporter has to pay export taxes, which is a benefit to the economy. The price has been adjusted to reflect the cost of the SCC and ISIC.

Price (2) = 0.75 x Price (1)
Price (3) = 0.6 x Price (1)

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Sensitivity Analysis 3:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 25. Economic Internal Rate of Return.

Year	Project Overhead Cost (US$1,000)	Additional Production (1,000 qq)	Price (US$/qq) (1)	(2)	(3)	Economic Revenue (1)	(2)	(3)	Additional Cost & Working Capital: Partial	Total	ICP	All	Net Income (1)	(2)	(3)
						(US$1,000)			(US$1,000)				(US$1,000)		
1991/92	5,238	0	91	68	54	0	0	0	0	0	325	325	(5,563)	(5,563)	(5,563)
1992/93	4,479	(4)	90	67	54	(373)	(280)	(224)	187	1,094	904	2,186	(7,038)	(6,945)	(6,889)
1993/94	2,640	(10)	97	73	58	(956)	(717)	(574)	453	2,296	1,917	4,666	(8,262)	(8,023)	(7,880)
1994/95	1,833	(7)	106	80	64	(770)	(578)	(462)	695	4,050	3,023	7,768	(10,371)	(10,179)	(10,063)
1995/96	1,810	20	108	81	65	2,209	1,657	1,326	1,157	5,955	3,985	11,097	(10,698)	(11,250)	(11,582)
1996/97		84	108	81	65	9,054	6,790	5,432	2,169	8,349	5,196	15,714	(6,661)	(8,924)	(10,282)
1997/98		210	108	81	65	22,706	17,030	13,624	2,803	6,238	5,463	14,504	8,202	2,525	(881)
1998/99		326	108	81	65	35,241	26,431	21,145	4,324	7,999	5,858	18,182	17,059	8,249	2,963
1999/00		413	108	81	65	44,692	33,519	26,815	5,330	7,916	5,250	18,495	26,197	15,024	8,320
2000/01		444	108	81	65	48,073	36,055	28,844	5,460	7,214	5,617	18,291	29,782	17,764	10,553
2001/02		432	108	81	65	46,711	35,034	28,027	4,598	6,531	5,633	16,762	29,950	18,272	11,265
2002/03		421	108	81	65	45,611	34,208	27,367	4,164	6,827	5,542	16,534	29,078	17,675	10,833
2003/04		421	108	81	65	45,611	34,208	27,367	4,441	6,827	5,514	16,782	28,829	17,426	10,585
2004/05		421	108	81	65	45,611	34,208	27,367	4,788	6,827	5,514	17,129	28,482	17,079	10,238
2005/06		421	108	81	65	45,611	34,208	27,367	5,482	6,827	5,514	17,823	27,789	16,386	9,544
2006/07		421	108	81	65	45,611	34,208	27,367	6,262	6,827	5,139	18,228	27,383	15,980	9,138
2007/08		414	108	81	65	44,755	33,566	26,853	6,594	6,357	4,366	17,317	27,438	16,249	9,536
2008/09		376	108	81	65	40,679	30,509	24,407	6,236	5,377	3,456	15,069	25,609	15,440	9,338
2009/10		309	108	81	65	33,428	25,071	20,057	3,888	3,886	2,376	10,151	23,278	14,921	9,907
2010/11		216	108	81	65	23,365	17,524	14,019	2,038	2,120	1,268	5,426	17,939	12,097	8,593
2011/12		112	108	81	65	12,075	9,056	7,245	67	158	161	385	11,689	8,671	6,859
Economic Internal Rate of Return													24.7%	16.2%	9.0%

Source: Tables 10, 14, 16 and 18.

Note: It should be noted that this is the prices recieved by the country, not the exporter. The exporter has to pay export taxes, which is a benefit to the economy. The price has been adjusted to reflect the cost of the SCC and ISIC.

Price (2) = 0.75 x Price (1)
Price (3) = 0.6 x Price (1)

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 35. Net Value Added to the Economy Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Net Int.	Use Good US$1,000	Invest-ment	NET
1991/92	0	92	0	259			(259)
1992/93	(5)	91	(569)	696	1,356		91
1993/94	(15)	99	(1,456)	1,278	2,967		233
1994/95	(11)	108	(1,172)	2,145	4,579		1,261
1995/96	31	110	3,363	3,373	5,512		5,501
1996/97	126	110	13,781	4,940	6,148		14,989
1997/98	315	110	34,563	5,959	989		29,593
1998/99	489	110	53,642	7,021			46,621
1999/00	620	110	68,027	8,012			60,016
2000/01	666	110	73,175	8,183			64,991
2001/02	648	110	71,102	8,164			62,938
2002/03	632	110	69,427	8,157			61,271
2003/04	632	110	69,427	8,157			61,271
2004/05	632	110	69,427	8,157			61,271
2005/06	632	110	69,427	8,157			61,271
2006/07	632	110	69,427	8,157			61,271
2007/08	620	110	68,123	7,930			60,193
2008/09	564	110	61,919	7,117			54,802
2009/10	463	110	50,883	5,827			45,056
2010/11	324	110	35,565	4,057			31,508
2011/12	167	110	18,379	2,095			16,285
SUM							800,173
AVERAGE							38,103
NET PRESENT VALUE AT 15% DISCOUNT							143,077

Source: Tables 12, 18 and 34.

Sensitivity Analysis B:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 35. Net Value Added to the Economy Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Net Use Int. Good US$1,000	Invest-ment	NET
1991/92	0	92	0	173		(173)
1992/93	(4)	91	(379)	464	904	61
1993/94	(10)	99	(971)	852	1,978	156
1994/95	(7)	108	(782)	1,430	3,052	841
1995/96	20	110	2,242	2,249	3,675	3,668
1996/97	84	110	9,187	3,293	4,099	9,993
1997/98	210	110	23,042	3,973	660	19,728
1998/99	326	110	35,761	4,681		31,081
1999/00	413	110	45,352	5,341		40,011
2000/01	444	110	48,783	5,456		43,328
2001/02	432	110	47,401	5,443		41,959
2002/03	421	110	46,285	5,438		40,847
2003/04	421	110	46,285	5,438		40,847
2004/05	421	110	46,285	5,438		40,847
2005/06	421	110	46,285	5,438		40,847
2006/07	421	110	46,285	5,438		40,847
2007/08	414	110	45,416	5,287		40,129
2008/09	376	110	41,279	4,745		36,534
2009/10	309	110	33,922	3,885		30,038
2010/11	216	110	23,710	2,705		21,005
2011/12	112	110	12,253	1,397		10,856
SUM						533,449
AVERAGE						25,402
NET PRESENT VALUE AT 15% DISCOUNT						95,385

Source: Tables 12, 18 and 34.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 32. Net Generation of Foreign Exchange and Use of Domestic Resources Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Use of Project F.X. US$1,000	Use of Project Invest.	NET F.X.	Domestic Resources Prod.	Domestic Resources Invest	Domestic Resources Total
1991/92	0	92	0	86	3,929	(4,015)	267	1,309	1,576
1992/93	(4)	91	(379)	313	2,968	(3,660)	671	1,511	2,182
1993/94	(10)	99	(971)	650	1,122	(2,742)	1,287	1,518	2,805
1994/95	(7)	108	(782)	1,069	262	(2,113)	2,255	1,571	3,826
1995/96	20	110	2,242	1,606	172	464	3,883	1,638	5,521
1996/97	86	110	9,187	2,237		6,950	6,570		6,570
1997/98	210	110	23,042	2,436		20,606	9,693		9,693
1998/99	326	110	35,761	2,730		33,031	13,037		13,037
1999/00	413	110	45,352	3,053		42,299	15,160		15,160
2000/01	444	110	48,783	3,078		45,705	16,282		16,282
2001/02	432	110	47,401	3,076		44,325	15,973		15,973
2002/03	421	110	46,285	3,106		43,179	15,646		15,646
2003/04	421	110	46,285	3,106		43,179	15,646		15,646
2004/05	421	110	46,285	3,106		43,179	15,646		15,646
2005/06	421	110	46,285	3,106		43,179	15,646		15,646
2006/07	421	110	46,285	3,106		43,179	15,646		15,646
2007/08	414	110	45,416	3,010		42,405	15,253		15,253
2008/09	376	110	41,279	2,691		38,588	13,751		13,751
2009/10	309	110	33,922	2,199		31,723	11,257		11,257
2010/11	216	110	23,710	1,529		22,181	7,840		7,840
2011/12	112	110	12,253	789		11,464	4,043		4,043
SUM						543,108			222,997
AVERAGE						25,862			10,619
NET PRESENT VALUE AT 15% DISCOUNT						87,722			47,596
Domestic Cost of Generating One Dollar									0.54

Source: Tables 12, 18, 29, and 31.

Sensitivity Analysis C:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 32. Net Generation of Foreign Exchange and Use of Domestic Resources Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Use of Project F.X. US$1,000	Use of Project Invest. US$1,000	NET F.X.	Domestic Resources Prod.	Domestic Resources Invest	Domestic Resources Total
1991/92	0	92	0	259	3,929	(4,188)	800	1,309	2,109
1992/93	(13)	91	(1,138)	938	2,968	(5,044)	2,012	1,511	3,523
1993/94	(34)	99	(3,386)	1,945	1,122	(6,453)	3,741	1,518	5,259
1994/95	(42)	108	(4,566)	3,191	262	(8,019)	6,254	1,571	7,825
1995/96	7	110	796	4,773	172	(4,149)	10,308	1,638	11,946
1996/97	141	110	15,483	6,621		8,862	16,976		16,976
1997/98	445	110	48,893	7,155		41,738	26,499		26,499
1998/99	729	110	80,101	7,988		72,113	32,961		32,961
1999/00	946	110	103,864	8,916		94,947	38,194		38,194
2000/01	1,026	110	112,627	8,983		103,644	41,216		41,216
2001/02	1,000	110	109,837	8,987		100,851	40,593		40,593
2002/03	978	110	107,422	9,081		98,340	39,824		39,824
2003/04	978	110	107,422	9,081		98,340	39,824		39,824
2004/05	978	110	107,422	9,081		98,340	39,824		39,824
2005/06	978	110	107,422	9,081		98,340	39,824		39,824
2006/07	978	110	107,422	9,081		98,340	39,824		39,824
2007/08	955	110	104,814	8,796		96,018	38,646		38,646
2008/09	862	110	94,601	7,855		86,747	34,638		34,638
2009/10	706	110	77,471	6,416		71,055	28,273		28,273
2010/11	492	110	53,972	4,457		49,514	19,636		19,636
2011/12	254	110	27,837	2,299		25,538	10,110		10,110
SUM						1,214,877			535,524
AVERAGE						57,851			26,454
NET PRESENT VALUE AT 15% DISCOUNT						195,200			114,271
Domestic Cost of Generating One Dollar									0.59

Source: Tables 12, 18, 29, and 31.

Sensitivity Analysis C:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 25. Economic Internal Rate of Return.

Year	Project Overhead Cost (US$1,000)	Additional Production (1,000 qq)	Price (US$/qq) (1)	(2)	(3)	Economic Revenue (1)	(2)	(3)	Additional Cost & Working Capital Partial	Total	ICP	All	Net Income (1)	(2)	(3)
						(US$1,000)			(US$1,000)				(US$1,000)		
1991/92	5,238	0	91	68	54	0	0	0	0	0	976	976	(6,214)	(6,214)	(6,214)
1992/93	4,479	(13)	90	67	54	(1,120)	(840)	(672)	562	3,282	2,713	6,557	(12,156)	(11,876)	(11,708)
1993/94	2,640	(34)	97	73	58	(3,335)	(2,502)	(2,001)	1,297	6,843	5,750	13,890	(19,866)	(19,032)	(18,531)
1994/95	1,833	(42)	106	80	64	(4,499)	(3,374)	(2,699)	1,775	11,807	9,069	22,651	(28,983)	(27,858)	(27,183)
1995/96	1,810	7	108	81	65	785	588	471	2,631	16,911	11,954	31,495	(32,521)	(32,717)	(32,835)
1996/97		141	108	81	65	15,258	11,443	9,155	4,780	23,191	15,589	43,559	(28,302)	(32,116)	(34,405)
1997/98		445	108	81	65	48,181	36,136	28,909	5,556	15,909	16,390	37,855	10,327	(1,719)	(8,946)
1998/99		729	108	81	65	78,935	59,201	47,361	9,279	20,401	17,575	47,254	31,681	11,947	107
1999/00		946	108	81	65	102,352	76,764	61,411	11,938	20,236	15,749	47,924	54,429	28,841	13,488
2000/01		1,026	108	81	65	110,988	83,241	66,593	12,388	18,468	16,851	47,706	63,281	35,534	18,886
2001/02		1,000	108	81	65	108,239	81,179	64,943	10,304	16,779	16,898	43,981	64,258	37,198	20,962
2002/03		978	108	81	65	105,858	79,394	63,515	9,279	17,495	16,627	43,401	62,457	35,992	20,114
2003/04		978	108	81	65	105,858	79,394	63,515	9,920	17,495	16,542	43,957	61,901	35,437	19,558
2004/05		978	108	81	65	105,858	79,394	63,515	10,961	17,495	16,542	44,998	60,861	34,396	18,517
2005/06		978	108	81	65	105,858	79,394	63,515	13,042	17,495	16,542	47,079	58,780	32,315	16,436
2006/07		978	108	81	65	105,858	79,394	63,515	15,383	17,495	15,418	48,296	57,562	31,098	15,219
2007/08		955	108	81	65	103,288	77,466	61,973	16,592	16,296	13,097	45,985	57,303	31,481	15,988
2008/09		862	108	81	65	93,225	69,918	55,935	16,065	13,788	10,369	40,222	53,002	29,696	15,712
2009/10		706	108	81	65	76,343	57,258	45,806	9,795	9,973	7,127	26,896	49,448	30,362	18,911
2010/11		492	108	81	65	53,186	39,890	31,912	5,132	5,449	3,805	14,386	38,800	25,504	17,526
2011/12		254	108	81	65	27,432	20,574	16,459	166	421	483	1,070	26,362	19,504	15,389
Economic Internal Rate of Return													22.4%	13.1%	4.9%

Source: Tables 10, 14, 16 and 18.

Note: It should be noted that this is the prices recieved by the country, not the exporter. The exporter has to pay export taxes, which is a benefit to the economy. The price has been adjusted to reflect the cost of the SCC and ISIC.

Price (2) = 0.75 x Price (1)
Price (3) = 0.6 x Price (1)

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Sensitivity Analysis D:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 25. Economic Internal Rate of Return.

Year	Project Overhead Cost (US$1,000)	Additional Production (1,000 qq)	Price (US$/qq) (1)	(2)	(3)	Economic Revenue (1)	(2)	(3)	Additional Cost & Working Capital: Partial	Total	ICP	All	Net Income (1)	(2)	(3)
						(US$1,000)			(US$1,000)				(US$1,000)		
1991/92	5,238	0	91	68	54	0	0	0	0	0	488	488	(5,726)	(5,726)	(5,726)
1992/93	4,479	(6)	90	67	54	(560)	(420)	(336)	281	1,641	1,357	3,279	(8,318)	(8,178)	(8,094)
1993/94	2,640	(17)	97	73	58	(1,668)	(1,251)	(1,001)	649	3,422	2,875	6,945	(11,253)	(10,836)	(10,586)
1994/95	1,833	(21)	106	80	64	(2,249)	(1,687)	(1,350)	888	5,904	4,534	11,326	(15,408)	(14,846)	(14,508)
1995/96	1,810	4	108	81	65	392	294	235	1,315	8,456	5,977	15,748	(17,165)	(17,263)	(17,322)
1996/97		71	108	81	65	7,629	5,722	4,577	2,390	11,595	7,794	21,780	(14,151)	(16,058)	(17,202)
1997/98		223	108	81	65	24,091	18,068	14,454	2,778	7,954	8,195	18,927	5,163	(859)	(4,473)
1998/99		365	108	81	65	39,468	29,601	23,681	4,639	10,200	8,787	23,627	15,840	5,974	53
1999/00		473	108	81	65	51,176	38,382	30,706	5,969	10,118	7,875	23,962	27,214	14,420	6,744
2000/01		513	108	81	65	55,494	41,620	33,296	6,194	9,234	8,426	23,853	31,641	17,767	9,443
2001/02		500	108	81	65	54,119	40,590	32,472	5,152	8,390	8,449	21,991	32,129	18,599	10,481
2002/03		489	108	81	65	52,929	39,697	31,757	4,639	8,747	8,314	21,701	31,228	17,996	10,057
2003/04		489	108	81	65	52,929	39,697	31,757	4,960	8,747	8,271	21,979	30,951	17,718	9,779
2004/05		489	108	81	65	52,929	39,697	31,757	5,480	8,747	8,271	22,499	30,430	17,198	9,259
2005/06		489	108	81	65	52,929	39,697	31,757	6,521	8,747	8,271	23,539	29,390	16,158	8,218
2006/07		489	108	81	65	52,929	39,697	31,757	7,691	8,747	7,709	24,148	28,781	15,549	7,610
2007/08		477	108	81	65	51,644	38,733	30,986	8,296	8,148	6,549	22,993	28,651	15,740	7,994
2008/09		431	108	81	65	46,612	34,959	27,967	8,033	6,894	5,185	20,111	26,501	14,848	7,856
2009/10		353	108	81	65	38,172	28,629	22,903	4,898	4,986	3,564	13,448	24,724	15,181	9,455
2010/11		246	108	81	65	26,593	19,945	15,956	2,566	2,725	1,903	7,193	19,400	12,752	8,763
2011/12		127	108	81	65	13,716	10,287	8,230	83	211	241	535	13,181	9,752	7,695
Economic Internal Rate of Return													19.9%	11.3%	3.7%

Source: Tables 10, 14, 16 and 18.

Note: It should be noted that this is the prices recieved by the country, not the exporter. The exporter has to pay export taxes, which is a benefit to the economy. The price has been adjusted to reflect the cost of the SCC and ISIC.

Price (2) = 0.75 x Price (1)
Price (3) = 0.6 x Price (1)

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 35. Net Value Added to the Economy Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Net Int.	Use Good US$1,000	Invest-ment	NET
1991/92	0	92	0	518			(518)
1992/93	(13)	91	(1,138)	1,392	2,712		182
1993/94	(34)	99	(3,386)	2,543	5,889		(41)
1994/95	(42)	108	(4,566)	4,238	9,065		262
1995/96	7	110	796	6,608	10,886		5,074
1996/97	141	110	15,483	9,597	12,135		18,021
1997/98	445	110	48,893	11,444	1,800		39,248
1998/99	729	110	80,101	13,404			66,697
1999/00	946	110	103,864	15,268			88,596
2000/01	1,026	110	112,627	15,576			97,051
2001/02	1,000	110	109,837	15,569			94,269
2002/03	978	110	107,422	15,576			91,846
2003/04	978	110	107,422	15,576			91,846
2004/05	978	110	107,422	15,576			91,846
2005/06	978	110	107,422	15,576			91,846
2006/07	978	110	107,422	15,576			91,846
2007/08	955	110	104,814	15,123			89,690
2008/09	862	110	94,601	13,549			81,052
2009/10	706	110	77,471	11,084			66,387
2010/11	492	110	53,972	7,711			46,260
2011/12	254	110	27,837	3,980			23,856
SUM							1,175,316
AVERAGE							55,967
NET PRESENT VALUE AT 15% DISCOUNT							205,938

Source: Tables 12, 18 and 34.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 35. Net Value Added to the Economy Due To The Project.

Year	Acd. Prod. 1,000 qq	Export Price US$/qq	Export Value	Net Int.	Use Good US$1,000	Invest-ment	NET
1991/92	0	92	0	259			(259)
1992/93	(6)	91	(569)	696	1,356		91
1993/94	(17)	99	(1,693)	1,271	2,944		(20)
1994/95	(21)	108	(2,283)	2,119	4,533		131
1995/96	4	110	398	3,304	5,443		2,537
1996/97	71	110	7,742	4,798	6,067		9,011
1997/98	223	110	24,446	5,722	900		19,624
1998/99	365	110	40,050	6,702			33,348
1999/00	473	110	51,932	7,634			44,298
2000/01	513	110	56,313	7,788			48,525
2001/02	500	110	54,919	7,784			47,134
2002/03	489	110	53,711	7,788			45,923
2003/04	489	110	53,711	7,788			45,923
2004/05	489	110	53,711	7,788			45,923
2005/06	489	110	53,711	7,788			45,923
2006/07	489	110	53,711	7,788			45,923
2007/08	477	110	52,407	7,562			44,845
2008/09	431	110	47,301	6,774			40,526
2009/10	353	110	38,735	5,542			33,193
2010/11	246	110	26,986	3,856			23,130
2011/12	127	110	13,918	1,990			11,928
SUM							587,658
AVERAGE							27,984
NET PRESENT VALUE AT 15% DISCOUNT							102,969

Source: Tables 12, 18 and 34.

Sensitivity Analysis E:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 32. Net Generation of Foreign Exchange and Use of Domestic Resources Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Use of Project F.X. US$1,000	Use of Project Invest.	NET F.X.	Domestic Resources Prod.	Domestic Resources Invest	Domestic Resources Total
1991/92	0	92	0	0	3,929	(3,929)	0	1,309	1,309
1992/93	0	91	0	259	2,968	(3,227)	800	1,511	2,311
1993/94	(13)	99	(1,234)	993	1,122	(3,349)	2,180	1,518	3,698
1994/95	(50)	108	(5,337)	2,314	262	(7,913)	4,133	1,571	5,704
1995/96	(35)	110	(3,816)	3,652	172	(7,640)	7,252	1,638	8,890
1996/97	73	110	8,044	5,328		2,715	13,047		13,047
1997/98	409	110	44,885	5,921		38,964	21,178		21,178
1998/99	766	110	84,114	6,805		77,310	31,500		31,500
1999/00	1,043	110	114,532	7,742		106,790	38,244		38,244
2000/01	1,137	110	124,827	7,820		117,007	41,613		41,613
2001/02	1,099	110	120,681	7,814		112,868	40,683		40,683
2002/03	1,069	110	117,332	7,901		109,431	39,702		39,702
2003/04	1,069	110	117,332	7,901		109,431	39,702		39,702
2004/05	1,069	110	117,332	7,901		109,431	39,702		39,702
2005/06	1,069	110	117,332	7,901		109,431	39,702		39,702
2006/07	1,069	110	117,332	7,901		109,431	39,702		39,702
2007/08	1,069	110	117,332	7,901		109,431	39,702		39,702
2008/09	1,045	110	114,724	7,615		107,109	38,525		38,525
2009/10	927	110	101,766	6,598		95,169	33,771		33,771
2010/11	648	110	71,129	4,586		66,544	23,519		23,519
2011/12	335	110	36,759	2,366		34,393	12,129		12,129
SUM						1,389,395			554,336
AVERAGE						66,162			26,397
NET PRESENT VALUE AT 15% DISCOUNT						218,504			106,664

Domestic Cost of Generating One Dollar 0.49

Source: Tables 12, 18, 29, and 31.

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 32. Net Generation of Foreign Exchange and Use of Domestic Resources Due To The Project.

Year	Add. Prod. 1,000 qq	Export Price US$/qq	Export Value	Use of Project F.X. US$1,000	Use of Project Invest.	NET F.X.	Domestic Resources Prod.	Domestic Resources Invest	Domestic Resources Total
1991/92	0	92	0	130	3,929	(4,059)	400	1,309	1,709
1992/93	(6)	91	(569)	469	2,968	(4,006)	1,006	1,511	2,517
1993/94	(17)	99	(1,693)	972	1,122	(3,788)	1,871	1,518	3,389
1994/95	(21)	108	(2,283)	1,595	262	(4,140)	3,127	1,571	4,698
1995/96	4	110	398	2,386	172	(2,160)	5,154	1,638	6,792
1996/97	71	110	7,742	3,311		4,431	8,488		8,488
1997/98	223	110	24,446	3,577		20,869	12,250		12,250
1998/99	365	110	40,050	3,994		36,057	16,480		16,480
1999/00	473	110	51,932	4,458		47,474	19,097		19,097
2000/01	513	110	56,313	4,491		51,822	20,608		20,608
2001/02	500	110	54,919	4,493		50,425	20,297		20,297
2002/03	489	110	53,711	4,541		49,170	19,912		19,912
2003/04	489	110	53,711	4,541		49,170	19,912		19,912
2004/05	489	110	53,711	4,541		49,170	19,912		19,912
2005/06	489	110	53,711	4,541		49,170	19,912		19,912
2006/07	489	110	53,711	4,541		49,170	19,912		19,912
2007/08	477	110	52,407	4,398		48,009	19,323		19,323
2008/09	431	110	47,301	3,927		43,373	17,319		17,319
2009/10	353	110	38,735	3,208		35,528	14,137		14,137
2010/11	246	110	26,986	2,229		24,757	9,818		9,818
2011/12	127	110	13,918	1,149		12,769	5,055		5,055
SUM						603,212			281,535
AVERAGE						28,724			13,406
NET PRESENT VALUE AT 15% DISCOUNT						94,283			59,631
Domestic Cost of Generating One Dollar									0.63

Source: Tables 12, 18, 29, and 31.

Sensitivity Analysis E:

EL SALVADOR - COFFEE TECHNOLOGY TRANSFER PROJECT

Table 25. Economic Internal Rate of Return.

Year	Project Overhead Cost (US$1,000)	Additional Production (1,000 qq)	Price (US$/qq) (1)	(2)	(3)	Economic Revenue (1)	(2)	(3)	Additional Cost & Working Capital Partial	Total	ICP	All	Net Income (1)	(2)	(3)
						(US$1,000)			(US$1,000)				(US$1,000)		
1991/92	5,238	0	91	68	54	0	0	0	0	0	0	0	(5,238)	(5,238)	(5,238)
1992/93	4,479	0	90	67	54	0	0	0	0	0	976	976	(5,455)	(5,455)	(5,455)
1993/94	2,640	(13)	97	73	58	(1,216)	(912)	(729)	562	3,282	2,919	6,763	(10,618)	(10,314)	(10,132)
1994/95	1,833	(50)	106	80	64	(5,258)	(3,944)	(3,155)	1,922	10,170	6,343	18,434	(25,526)	(24,211)	(23,422)
1995/96	1,810	(35)	108	81	65	(3,760)	(2,820)	(2,256)	2,319	14,116	9,866	26,301	(31,871)	(30,931)	(30,367)
1996/97		73	108	81	65	7,927	5,945	4,756	3,821	20,916	13,006	37,743	(29,8[illegible]7)	(31,799)	(32,988)
1997/98		409	108	81	65	44,232	33,174	26,539	5,028	15,373	13,768	34,169	10,062	(995)	(7,630)
1998/99		766	108	81	65	82,890	62,168	49,734	10,541	21,165	15,053	46,759	36,131	15,408	2,975
1999/00		1,043	108	81	65	112,865	84,649	67,719	14,098	20,684	13,258	48,040	64,825	36,609	19,679
2000/01		1,137	108	81	65	123,010	92,257	73,806	14,195	18,580	14,359	47,134	75,876	45,123	26,672
2001/02		1,099	108	81	65	118,925	89,194	71,355	11,611	16,529	14,406	42,546	76,378	46,647	28,808
2002/03		1,069	108	81	65	115,624	86,718	69,375	10,309	17,418	14,136	41,863	73,762	44,856	27,512
2003/04		1,069	108	81	65	115,624	86,718	69,375	11,140	17,418	14,050	42,608	73,016	44,110	26,767
2004/05		1,069	108	81	65	115,624	86,718	69,375	11,140	17,418	14,050	42,608	73,016	44,110	26,767
2005/06		1,069	108	81	65	115,624	86,718	69,375	12,180	17,418	14,050	43,649	71,976	43,070	25,726
2006/07		1,069	108	81	65	115,624	86,718	69,375	15,302	17,418	14,050	46,770	68,854	39,948	22,604
2007/08		1,069	108	81	65	115,624	86,718	69,375	17,643	17,418	12,926	47,987	67,637	38,731	21,387
2008/09		1,045	108	81	65	113,054	84,791	67,833	18,637	16,009	10,369	45,015	68,039	39,776	22,817
2009/10		927	108	81	65	100,285	75,214	60,171	11,665	11,659	7,127	30,452	69,834	44,762	29,720
2010/11		648	108	81	65	70,094	52,571	42,057	6,113	6,361	3,805	16,279	53,816	36,292	25,778
2011/12		335	108	81	65	36,224	27,168	21,734	200	473	483	1,156	35,068	26,012	20,578
Economic Internal Rate of Return													29.1%	19.6%	11.6%

Source: Tables 10, 14, 16 and 18.

Note: It should be noted that this is the prices recieved by the country, not the exporter. The exporter has to pay export taxes, which is a benefit to the economy. The price has been adjusted to reflect the cost of the SCC and ISIC.

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AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES OF AMERICA A. I. D. MISSION
TO EL SALVADOR
C/O AMERICAN EMBASSY,
SAN SALVADOR, EL SALVADOR, C. A.

ACTION MEMORANDUM FOR THE MISSION DIRECTOR

FROM: Richard K. Archi, DDIR RArchi 6/18

SUBJECT: Approval of the Coffee Technology Transfer PID, No. 519-0362

ISSUE: You are requested to approve the subject PID and sign the attached facesheet.

BACKGROUND: In El Salvador, coffee is agriculture's predominant crop and the nation's basic economic activity. Coffee is the country's primary source of employment, foreign exchange, fiscal revenues and natural resource conservation. El Salvador has been Central America's premier producer and exporter of coffee, however, in recent years both its share of Central American production, as well as its absolute quantity of coffee production has been decreasing. The intensity with which Salvadoran coffee is cultivated has decreased during the 1980's as indicated by lower yields per hectare.

The principal constraints impinging on growth in the coffee sector have been unfavorable macroeconomic and agricultural sector policies. The overvalued exchange rate, heavy export taxes and public sector intrusions into processing and marketing, limited profits and reduced the propensity for farmer investment in their crop. While the policy environment has shifted dramatically over the last six months and improved the incentives for production and export of coffee, without improvements in the institutional and technological areas, no policy environment will be sufficiently friendly to make Salvadoran coffee competitive or to restore the industry to its pre-1980 levels. The Coffee Technology Transfer Project will respond to these needs.

The goal of the project is to increase rural family incomes, to increase foreign exchange earnings and to contribute to the GOES fiscal balance. The purpose is to increase small and medium coffee farmer productivity, national coffee production and to improve the quality of coffee produced by project beneficiaries. The purpose will be accomplished through a coordinated effort of reform and strengthening of the institutional framework which supports coffee technology and transfer in El Salvador.

The project will focus on developing and strengthening the following institutions: The Salvadoran Coffee Council (CSC), the privatized Salvadoran Institute for Coffee Research (ISIC), various coffee federations and organized intermediary groups. These institutions will receive funding for technical assistance, training, commodities and administrative support. The CSC will provide critical policy and planning guidance for the coffee sector. ISIC and the intermediary institutions will serve to reactivate the technology development and packaging programs, and the training and extension capabilities. This strategy will produce Salvadoran institutions capable of developing and transferring coffee production technologies to thousands of small and medium-sized farmer beneficiaries within a policy environment consistent with GOES economic and social principles.

DISCUSSION: The Mission Review of the subject PID was held on May 30, 1990. The PID was approved by the Review Committee and the design team was directed to begin work on the Project Paper for an early FY91 obligation. The decisions and actions to follow are summarized below:

A. Internal Design Conclusions.

1. The Review Committee agreed that a privatized ISIC was crucial to the success of the Project. Therefore, as a condition to signing the initial Project Agreement, the GOES and private sector coffee entities would take the necessary legal and technical steps to ensure private sector status for ISIC, in a manner acceptable to AID (i.e., including a coffee tax check off or other means for providing a source of income for ISIC). To achieve this objective, the Mission will make available appropriate technical assistance under the 0349 Project. The RDO will immediately initiate talks with the Minister of Agriculture and the ISIC Privatization Committee to determine the TA Requirements.

2. In the initial PID design, approximately 100 percent of the small and small-medium farmers were targetted as direct beneficiaries. The review committee discussed whether this target was realistic given the dispersed and non-organized nature of a significant number of small farmers. Also, they voiced concern about whether all the lands of potential small farmer beneficiaries would meet basic standards for growing higher quality varieties, i.e., appropriate altitude, shading, water availability, etc. The committee members directed the design group to study the planned beneficiary pool more closely during intensive review, and to strive for a balance in terms of productivity/cost effectiveness and equity, based on factors such as land quality, technology availability, etc.

3. Given the reliance of the project design on organizations such as the privatized ISIC and intermediary federations, the review committee urged that the design team conduct thorough institutional analyses of all potential participating entities, carefully identifying needs and designing institutional strengthening measures into the Project. The design team will also assure that these institutions set up the appropriate financial controls and auditing procedures.

4. Although the availability of credit does not present a current problem in the coffee sector, the design team will study the parameters of future demand and supply to assure needs can be met.

B. Externalities: The following are items, which can not be addressed within the project design, but which may influence the conduct of project implementation.

1. Representatives from the public and private sector have convened working groups to develop strategies for stimulating both non-traditional and traditional exports. Mission staff, particularly RDO, should work with the coffee group to ensure complementarity of the project strategy.

2. Coffee taxes have caused multiple impacts in Salvadoran society from creating disincentives for coffee production to providing the financial lifeline for essential public sector services. The design team will study the overall effects of coffee taxes and their permutations on the sector and society. This project can provide a vehicle to discuss these issues; however, actual policy dialogue will have to take place outside its realm. That is, the tax issue encompasses a broader range of elements and actors. Therefore, a forum such as the balance of payments negotiations would probably enable much more thorough discussions and more comprehensive agreements in resolving any issues related to the coffee tax.

AUTHORITY: The Acting AA/LAC redelegated authority to you to approve this PID during the FY 90-91 Action Plan review held in 1989.

RECOMMENDATION: That you approve the Coffee Technology Transfer PID and sign the accompanying facesheet.

APPROVED _____

DISAPPROVED _____

DATE 6/17/90

Drafted by: PRJ, ELandau/SNovellino draft Date 6-08-90
Cleared by: PRJ, DKennedy draft Date 6-13-90
RDO, MWise draft Date 6-14-90
RDO, KEllis Date 14 June 90
DPP, TMcKee Date 4/6/90
AMDO, JHeard Date 6/17/90

5146B/apl.

AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES OF AMERICA A. I. D. MISSION
TO EL SALVADOR
C/O AMERICAN EMBASSY,
SAN SALVADOR, EL SALVADOR, C. A.

MEMORANDUM

TO: See Distribution

FROM: Deborah Kennedy, PRJ

SUBJECT: Issues for the Mission Review of the Coffee Technology Transfer PID, Project No. 519-0362.

The following issues have been identified for the subject Mission Review to be held on May 30, 1990:

1. During the last ten years coffee producers have been reluctant to invest in coffee production due to varying reasons elaborated in the PID. Concurrently, the lack of demand for technical assistance contributed to deterioration of the capabilities of the private and public enterprises conducting research and developing improved technologies. This project will focus on technical assistance and training to fill this technological gap. However, the implementation of the technological improvements still depends on the capability and willingness of the coffee producers to invest in their land, including replantings.

A. To what extent have coffee producers demonstrated their willingness to invest in technological improvements such as those to be delivered under the Project? Without investment in replantings, etc., What impact will these technological improvements have on yields and productivity?

B. Generally, coffee producers have found credit to be available. However, with the potential for increased credit demand, as well as the GOES' more disciplined monetary and fiscal policies, the supply of credit may not meet the needs of these producers. What would be the impact of the Project given a shortage of credit? How will the Project respond?

2. ISIC will be one of the key implementing institutions. However, it is probable that significant organizational reforms, training and commodities will be required before ISIC is able to deliver assistance to coffee producers. What is the status of ISIC's privatization? What is our position on privatization (e.g. is it a condition precedent)? What actions, if any, should the Mission take?

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3. A basic tenet of this Project is to work through intermediary organizations as conduits for technical assistance and technology packages. However, a significant number of small producers are independent or are not members of formal cooperatives. What mechanisms, if any, need to be developed to reach the foregoing farmers?

4. The PID notes that the coffee tax structure is a problem. To what extent should the Mission attempt to alter the coffee tax structure? Is it feasible? What are the implications of possible changes?

5C(2) - ASSISTANCE CHECKLIST

Listed below are statutory criteria applicable to the assistance resources themselves, rather than to the eligibility of a country to receive assistance. This section is divided into three parts. Part A includes criteria applicable to both Development Assistance and Economic Support Fund resources. Part B includes criteria applicable only to Development Assistance resources. Part C includes criteria applicable only to Economic Support Funds.

CROSS REFERENCE: IS COUNTRY CHECKLIST UP TO DATE? — Yes, per PAAD 519-0369

A. CRITERIA APPLICABLE TO BOTH DEVELOPMENT ASSISTANCE AND ECONOMIC SUPPORT FUNDS

1. **Host Country Development Efforts** (FAA Sec. 601(a)): Information and conclusions on whether assistance will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.

The project will foster private initiative, encou: the development of cooperat: and improve the technical efficiency of agriculture through application of improved coffee productior technology.

2. **U.S. Private Trade and Investment** (FAA Sec. 601(b)): Information and conclusions on how assistance will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

The project will finance the procurement of approximately $2 million in U.S. exports.

3. **Congressional Notification**

a. **General requirement** (FY 1991 Appropriations Act Secs. 523 and 591; FAA Sec. 634A): If money is to be obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified (unless the notification requirement has been waived because of substantial risk to human health or welfare)? N/A

b. **Notice of new account obligation** (FY 1991 Appropriations Act Sec. 514): If funds are being obligated under an appropriation account to which they were not appropriated, has the President consulted with and provided a written justification to the House and Senate Appropriations Committees and has such obligation been subject to regular notification procedures? N/A

c. **Cash transfers and nonproject sector assistance** (FY 1991 Appropriations Act Sec. 575(b)(3)): If funds are to be made available in the form of cash transfer or nonproject sector assistance, has the Congressional notice included a detailed description of how the funds will be used, with a discussion of U.S. interests to be served and a description of any economic poolicy reforms to be promoted? N/A

4. **Engineering and Financial Plans** (FAA Sec. 611(a)): Prior to an obligation in excess of $500,000, will there be: (a) engineering, financial or other plans necessary to carry out the assistance; and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? The project includes appropriately detailed financial plans, with a firm estimate of U.S. assistance. No construction over $500,000 is planned.

5. **Legislative Action** (FAA Sec. 611(a)(2)): If legislative action is required within recipient country with respect to an obligation in excess of $500,000, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance? N/A

6. **Water Resources (FAA Sec. 611(b); FY 1991 Appropriations Act Sec. 501):** If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, *et seq.*)? (See A.I.D. Handbook 3 for guidelines.)	N/A
7. **Cash Transfer and Sector Assistance (FY 1991 Appropriations Act Sec. 575(b)):** Will cash transfer or nonproject sector assistance be maintained in a separate account and not commingled with other funds (unless such requirements are waived by Congressional notice for nonproject sector assistance)?	N/A
8. **Capital Assistance (FAA Sec. 611(e)):** If project is capital assistance (*e.g.*, construction), and total U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?	N/A
9. **Multiple Country Objectives (FAA Sec. 601(a)):** Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	The project will foste private initiative, encourage the developm of cooperatives, and improve technical efficiency in agricult through the use of improved coffee produc techn^'ogy.
10. **U.S. Private Trade (FAA Sec. 601(b)):** Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	The project will finan approximately $2 milli in U.S. exports (inluding purchase of 73 U.S. made vehicle).

11. Local Currencies

a. Recipient Contributions (FAA Secs. 612(b), 636(h)): Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

N/A

(Counterpart contribution will be delivered exclusively from "check-off" fees collected on coffee exports.)

b. U.S.-Owned Currency (FAA Sec. 612(d)): Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

NO

c. Separate Account (FY 1991 Appropriations Act Sec. 575). If assistance is furnished to a foreign government under arrangements which result in the generation of local currencies:

N/A

(1) Has A.I.D. (a) required that local currencies be deposited in a separate account established by the recipient government, (b) entered into an agreement with that government providing the amount of local currencies to be generated and the terms and conditions under which the currencies so deposited may be utilized, and (c) established by agreement the responsibilities of A.I.D. and that government to monitor and account for deposits into and disbursements from the separate account?

(2) Will such local currencies, or an equivalent amount of local currencies, be used only to carry out the purposes of the DA or ESF chapters of the FAA (depending on which chapter is the source of the assistance) or for the administrative requirements of the United States Government?

(3) Has A.I.D. taken all appropriate steps to ensure that the equivalent of local currencies disbursed from the separate account are used for the agreed purposes?

(4) If assistance is terminated to a country, will any unencumbered balances of funds remaining in a separate account be disposed of for purposes agreed to by the recipient government and the United States Government?

12. Trade Restrictions

a. Surplus Commodities (FY 1991 Appropriations Act Sec. 521(a)): If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? No

b. Textiles (Lautenberg Amendment) (FY 1991 Appropriations Act Sec. 521(c)): Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel? No

13. Tropical Forests (FY 1991 Appropriations Act Sec. 533(c)(3)): Will funds be used for any program, project or activity which would (a) result in any significant loss of tropical forests, or (b) involve industrial timber extraction in primary tropical forest areas? No

14. Sahel Accounting (FAA Sec. 121(d)): If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)? N/A

15. PVO Assistance

a. Auditing and registration (FY 1991 Appropriations Act Sec. 537): If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.? PROCAFE is a registered Salvadoran PVO and has acceptable internal cont for audit.

b. Funding sources (FY 1991 Appropriations Act, Title II, under heading "Private and Voluntary Organizations"): If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government? N/A

16. Project Agreement Documentation (State Authorization Sec. 139 (as interpreted by conference report)): Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision). N/A

17. Metric System (Omnibus Trade and Competitiveness Act of 1988 Sec. 5164, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A.I.D. policy): Does the assistance activity use the metric system of measurement in its procurements, grants, and other business-related activities, except to the Yes

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extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A.I.D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?

18. Women in Development (FY 1991 Appropriations Act, Title II, under heading "Women in Development"): Will assistance be designed so that the percentage of women participants will be demonstrably increased? — Yes

19. Regional and Multilateral Assistance (FAA Sec. 209): Is assistance more efficiently and effectively provided through regional or multilateral organizations? If so, why is assistance not so provided? Information and conclusions on whether assistance will encourage developing countries to cooperate in regional development programs. — No

20. Abortions (FY 1991 Appropriations Act, Title II, under heading "Population, DA," and Sec. 525): — N/A

a. Will assistance be made available to any organization or program which, as determined by the President, supports or participates in the management of a program of coercive abortion or involuntary sterilization?

b. Will any funds be used to lobby for abortion?

21. Cooperatives (FAA Sec. 111): Will assistance help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life? — The project will assist approximately 75 cooperati to increase their income through more efficient production and processing coffee.

22. U.S.-Owned Foreign Currencies

a. Use of currencies (FAA Secs. 612(b), 636(h); FY 1991 Appropriations Act Secs. 507, 509): Describe steps taken to assure that, to the maximum extent possible, foreign currencies owned by the U.S. are utilized in lieu of dollars to meet the cost of contractual and other services. N/A

b. Release of currencies (FAA Sec. 612(d)): Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? No

23. Procurement

a. Small business (FAA Sec. 602(a)): Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes

b. U.S. procurement (FAA Sec. 604(a)): Will all procurement be from the U.S. except as otherwise determined by the President or determined under delegation from him? Yes

c. Marine insurance (FAA Sec. 604(d)): If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? N/A

d. Non-U.S. agricultural procurement (FAA Sec. 604(e)): If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) Yes

e. Construction or engineering services (FAA Sec. 604(g)): Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible N/A

under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.)

f. Cargo preference shipping (FAA Sec. 603)): Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? — No

g. Technical assistance (FAA Sec. 621(a)): If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? — Yes

h. U.S. air carriers (International Air Transportation Fair Competitive Practices Act, 1974): If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? — Yes

i. Termination for convenience of U.S. Government (FY 1991 Appropriations Act Sec. 504): If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? — Yes

j. Consulting services (FY 1991 Appropriations Act Sec. 524): If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? Yes

k. Metric conversion (Omnibus Trade and Competitiveness Act of 1988, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A.I.D. policy): Does the assistance program use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A.I.D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage? Yes

l. Competitive Selection Procedures (FAA Sec. 601(e)): Will the assistance utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes

24. Construction

a. Capital project (FAA Sec. 601(d)): If capital (e.g., construction) project, will U.S. engineering and professional services be used? N/A

b. Construction contract (FAA Sec. 611(c)): If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? N/A

c. Large projects, congressional approval (FAA Sec. 620(k)): If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the Congressional Presentation), or does assistance have the express approval of Congress? — N/A

25. U.S. Audit Rights (FAA Sec. 301(d)): If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? — Yes

26. Communist Assistance (FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? — Yes

27. Narcotics

a. Cash reimbursements (FAA Sec. 483): Will arrangements preclude use of financing to make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? — Yes

b. Assistance to narcotics traffickers (FAA Sec. 487): Will arrangements take "all reasonable steps" to preclude use of financing to or through individuals or entities which we know or have reason to believe have either: (1) been convicted of a violation of any law or regulation of the United States or a foreign country relating to narcotics (or other controlled substances); or (2) been an illicit trafficker in, or otherwise involved in the illicit trafficking of, any such controlled substance? — Yes

28. **Expropriation and Land Reform** (FAA Sec. 620(g)): Will assistance preclude use of financing to compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President?	Yes
29. **Police and Prisons** (FAA Sec. 660): Will assistance preclude use of financing to provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?	Yes
30. **CIA Activities** (FAA Sec. 662): Will assistance preclude use of financing for CIA activities?	Yes
31. **Motor Vehicles** (FAA Sec. 636(i)): Will assistance preclude use of financing for purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?	Yes
32. **Military Personnel** (FY 1991 Appropriations Act Sec. 503): Will assistance preclude use of financing to pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel?	Yes
33. **Payment of U.N. Assessments** (FY 1991 Appropriations Act Sec. 505): Will assistance preclude use of financing to pay U.N. assessments, arrearages or dues?	Yes
34. **Multilateral Organization Lending** (FY 1991 Appropriations Act Sec. 506): Will assistance preclude use of financing to carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)?	Yes
35. **Export of Nuclear Resources** (FY 1991 Appropriations Act Sec. 510): Will assistance preclude use of financing to finance the export of nuclear equipment, fuel, or technology?	Yes

36. **Repression of Population (FY 1991 Appropriations Act Sec. 511):** Will assistance preclude use of financing for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? — Yes

37. **Publicity or Propoganda (FY 1991 Appropriations Act Sec. 516):** Will assistance be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress? — No

38. **Marine Insurance (FY 1991 Appropriations Act Sec. 563):** Will any A.I.D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U.S. marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is necessary or appropriate? — Yes

39. **Exchange for Prohibited Act (FY 1991 Appropriations Act Sec. 569):** Will any assistance be provided to any foreign government (including any instrumentality or agency thereof), foreign person, or United States person in exchange for that foreign government or person undertaking any action which is, if carried out by the United States Government, a United States official or employee, expressly prohibited by a provision of United States law? — No

B. CRITERIA APPLICABLE TO DEVELOPMENT ASSISTANCE ONLY

1. **Agricultural Exports (Bumpers Amendment)** (FY 1991 Appropriations Act Sec. 521(b), as interpreted by conference report for original enactment): If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities: (1) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (2) in support of research that is intended primarily to benefit U.S. producers?	No
2. **Tied Aid Credits** (FY 1991 Appropriations Act, Title II, under heading "Economic Support Fund"): Will DA funds be used for tied aid credits?	No
3. **Appropriate Technology** (FAA Sec. 107): Is special emphasis placed on use of appropriate technology (defined as relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?	Yes
4. **Indigenous Needs and Resources** (FAA Sec. 281(b)): Describe extent to which the activity recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	The project embodies a feed-back loop for the trial of production technology and the revision of that technolc based on the experience of th participating farmers.

5. **Economic Development (FAA Sec. 101(a)):** Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes

6. **Special Development Emphases (FAA Secs. 102(b), 113, 281(a)):** Describe extent to which activity will: (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

The project will deal wit approximately 20,000 smal farmers, most of whom ear less than $700 annually. About 20% of this group a families headed by women.

7. **Recipient Country Contribution (FAA Secs. 110, 124(d)):** Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

Yes

8. **Benefit to Poor Majority (FAA Sec. 128(b)):** If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?

The project cotains a management information sys which will assist the moni ing of the ultimate benefi ciaries.

10. **Contract Awards (FAA Sec. 601(e)):** Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? — Yes

11. **Disadvantaged Enterprises (FY 1991 Appropriations Act Sec. 567):** What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? — None

12. **Biological Diversity (FAA Sec. 119(g):** Will the assistance: (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas? — No

13. **Tropical Forests (FAA Sec. 118; FY 1991 Appropriations Act Sec. 533(c)-(e) & (g)):**

a. **A.I.D. Regulation 16:** Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? — Yes

b. **Conservation:** Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent

feasible: (1) stress the importance of conserving and sustainably managing forest resources; (2) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (3) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (4) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (5) help conserve forests which have not yet been degraded by helping to increase production on lands already cleared or degraded; (6) conserve forested watersheds and rehabilitate those which have been deforested; (7) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (8) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (9) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (10) seek to increase the awareness of U.S. Government agencies and other donors of the immediate and long-term value of tropical forests; (11) utilize the resources and abilities of all relevant U.S. government agencies; (12) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land; and (13) take full account of the environmental impacts of the proposed activities on biological diversity?

c. **Forest degradation:** Will assistance be used for: (1) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; (2) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas; (3) activities which would result in the conversion of forest lands to the rearing of livestock; (4) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undergraded forest lands; (5) the colonization of forest lands; or (6) the construction of dams or other water control structures which flood relatively undergraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development? — No

d. **Sustainable forestry:** If assistance relates to tropical forests, will project assist countries in developing a systematic analysis of the appropriate use of their total tropical forest resources, with the goal of developing a national program for sustainable forestry? — N/A

e. **Environmental impact statements:** Will funds be made available in accordance with provisions of FAA Section 117(c) and applicable A.I.D. regulations requiring an environmental impact statement for activities significantly affecting the environment? — Yes

14. **Energy** (FY 1991 Appropriations Act Sec. 533(c)): If assistance relates to energy, will such assistance focus on: (a) end-use energy efficiency, least-cost energy planning, and renewable energy resources, and (b) the key countries where assistance would have the greatest impact on reducing emissions from greenhouse gases? N/A

15. **Sub-Saharan Africa Assistance** (FY 1991 Appropriations Act Sec. 562, adding a new FAA chapter 10 (FAA Sec. 496)): If assistance will come from the Sub-Saharan Africa DA account, is it: (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) to be used to promote sustained economic growth, encourage private sector development, promote individual initiatives, and help to reduce the role of central governments in areas more appropriate for the private sector; (c) being provided in accordance with the policies contained in FAA section 102; (d) being provided in close consultation with African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (e) being used to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups; (f) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication networks, N/A

to maintain and restore the renewable natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

16. Debt-for-Nature Exchange (FAA Sec. 463): If project will finance a debt-for-nature exchange, describe how the exchange will support protection of: (a) the world's oceans and atmosphere, (b) animal and plant species, and (c) parks and reserves; or describe how the exchange will promote: (d) natural resource management, (e) local conservation programs, (f) conservation training programs, (g) public commitment to conservation, (h) land and ecosystem management, and (i) regenerative approaches in farming, forestry, fishing, and watershed management. N/A

17. Deobligation/Reobligation (FY 1991 Appropriations Act Sec. 515): If deob/reob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same region as originally obligated, and have the House and Senate Appropriations Committees been properly notified? N/A

18. Loans

a. Repayment capacity (FAA Sec. 122(b)): Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest. N/A

b. Long-range plans (FAA Sec. 122(b)): Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities? — N/A

c. Interest rate (FAA Sec. 122(b)): If development loan is repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter? — N/A

d. Exports to United States (FAA Sec. 620(d)): If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest? — N/A

19. Development Objectives (FAA Secs. 102(a), 111, 113, 281(a)): Extent to which activity will: (1) effectively involve the poor in development, by expanding access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (2) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (3) support the self-help efforts of developing countries; (4) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (5) utilize and encourage regional cooperation by developing countries? — The project will assist poor farmers to improve thei coffee yields, and hence incomes, through the application of improved production technology.

20. Agriculture, Rural Development and Nutrition, and Agricultural Research (FAA Secs. 103 and 103A):

a. Rural poor and small farmers: If assistance is being made available for agriculture, rural development or nutrition, describe extent to which activity is specifically designed to increase productivity and income of rural poor; or if assistance is being made available for agricultural research, has account been taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made.

The project will design lab intensive production technologies which can accommodate the lack of capital experienced by smal farmers. The technologies be field tested in the farm own districts.

b. Nutrition: Describe extent to which assistance is used in coordination with efforts carried out under FAA Section 104 (Population and Health) to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value; improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration programs explicitly addressing the problem of malnutrition of poor and vulnerable people.

N/A

c. Food security: Describe extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures encouraging domestic production, building national food reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

N/A

21. Population and Health (FAA Secs. 104(b) and (c)): If assistance is being made available for population or health activities, describe extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of

N/A

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mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems, and other modes of community outreach.

22. Education and Human Resources Development (FAA Sec. 105): If assistance is being made available for education, public administration, or human resource development, describe (a) extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, and strengthens management capability of institutions enabling the poor to participate in development; and (b) extent to which assistance provides advanced education and training of people of developing countries in such disciplines as are required for planning and implementation of public and private development activities. N/A

23. Energy, Private Voluntary Organizations, and Selected Development Activities (FAA Sec. 106): If assistance is being made available for energy, private voluntary organizations, and selected development problems, describe extent to which activity is: N/A

a. concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; and facilitative of research on and development and use of small-scale, decentralized, renewable energy sources for rural areas, emphasizing development of energy resources which are environmentally acceptable and require minimum capital investment;

b. concerned with technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

c. research into, and evaluation of, economic development processes and techniques;

d. reconstruction after natural or manmade disaster and programs of disaster preparedness;

e. for special development problems, and to enable proper utilization of infrastructure and related projects funded with earlier U.S. assistance;

f. for urban development, especially small, labor-intensive enterprises, marketing systems for small producers, and financial or other institutions to help urban poor participate in economic and social development.

24. Sahel Development (FAA Secs. 120-21). If assistance is being made available for the Sahelian region, describe: (a) extent to which there is international coordination in planning and implementation; participation and support by African countries and organizations in determining development priorities; and a long-term, multidonor development plan which calls for equitable burden-sharing with other donors; (b) whether a determination has been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of projects funds (dollars or local currency generated therefrom). N/A

C. CRITERIA APPLICABLE TO ECONOMIC SUPPORT FUNDS ONLY

N/A

1. Economic and Political Stability (FAA Sec. 531(a)): Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA?

2. Military Purposes (FAA Sec. 531(e)): Will this assistance be used for military or paramilitary purposes?

3. Commodity Grants/Separate Accounts (FAA Sec. 609): If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

4. Generation and Use of Local Currencies (FAA Sec. 531(d)): Will ESF funds made available for commodity import programs or other program assistance be used to generate local currencies? If so, will at least 50 percent of such local currencies be available to support activities consistent with the objectives of FAA sections 103 through 106?

5. Cash Transfer Requirements (FY 1991 Appropriations Act, Title II, under heading "Economic Support Fund," and Sec. 575(b)). If assistance is in the form of a cash transfer:

a. Separate account: Are all such cash payments to be maintained by the country in a separate account and not to be commingled with any other funds?

b. Local currencies: Will all local currencies that may be generated with funds provided as a cash transfer to such a country also be deposited in a special account, and has A.I.D. entered into an agreement with that government setting forth the amount of the local currencies to be generated, the terms and conditions under which they are to be used, and the responsibilities of A.I.D. and that government to monitor and account for deposits and disbursements?

c. U.S. Government use of local currencies: Will all such local currencies also be used in accordance with FAA Section 609, which requires such local currencies to be made available to the U.S. government as the U.S. determines necessary for the requirements of the U.S. Government, and which requires the remainder to be used for programs agreed to by the U.S. Government to carry out the purposes for which new funds authorized by the FAA would themselves be available?

d. Congressional notice: Has Congress received prior notification providing in detail how the funds will be used, including the U.S. interests that will be served by the assistance, and, as appropriate, the economic policy reforms that will be promoted by the cash transfer assistance?

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