

GUATEMALA

**MANAGEMENT AND CONSERVATION OF RENEWABLE NATURAL RESOURCES
IN THE UPPER CHIXOY RIVER VALLEY**

(GU-0064)

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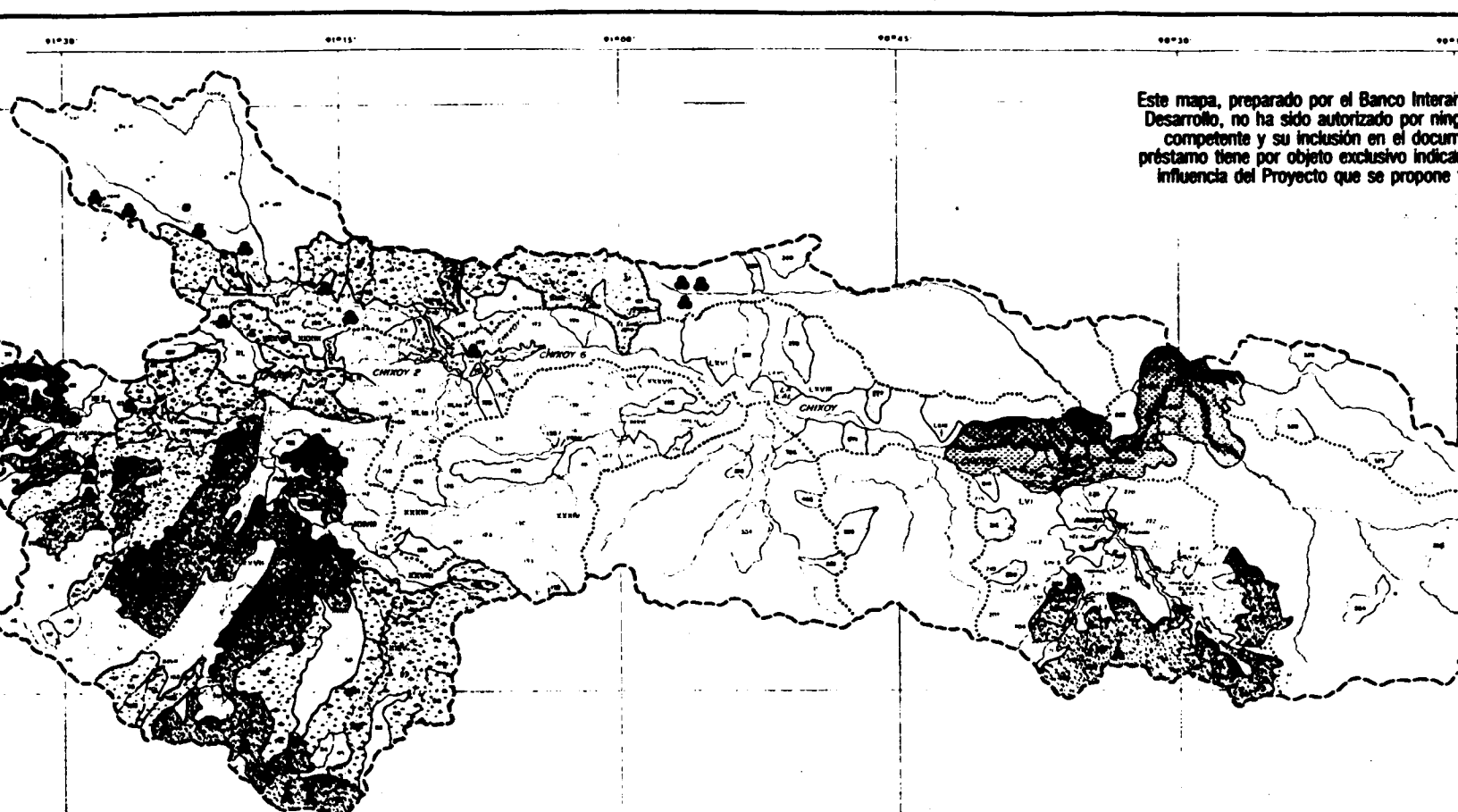
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ACRONYMS AND ABBREVIATIONS

BANDESA	National Agricultural Development Bank
CARE	Cooperative for American Relief Everywhere
CATIE	Tropical Agricultural Research and Training Center
CDRO	Cooperación para el Desarrollo Rural de Occidente [Western Rural Development Cooperation]
COCASPA	Coordinadora Consultiva y Administrativa [Consultative and Administrative Coordinating Office]
CONACUEM	Comisión Nacional para el Manejo de Cuencas Hidrográficas [National Watershed Management Commission]
CONAMA	Comisión Nacional del Medio Ambiente [National Environmental Commission]
CONAP	Consejo Nacional de Areas Protegidas [National Council for Protected Areas]
COPROSEC	Consejo de Programación Sectorial [Sectoral Planning Council]
DIGEBOS	Dirección General de Bosques y Vida Silvestre [Directorate General of Forests and Wildlife]
DIGESA	Dirección General de Servicios Agrícolas [Directorate General of Agricultural Services]
DIGESEPE	Dirección General de Servicios Pecuarios [Directorate General of Livestock Services]
ICTA	Instituto de Ciencia y Tecnología Agrícola [Agricultural Science and Technology Institute]
IFAD	International Fund for Agricultural Development
INAFOR	Instituto Nacional Forestal [National Forestry Institute]
INDE	Instituto Nacional de Electrificación [National Electrification Authority]
INDECA	Instituto Nacional de Comercialización Agrícola [National Agricultural Marketing Authority]
INTA	Instituto Nacional de Transformación Agraria [National Authority for Agrarian Change]
MAGA	Ministry of Agriculture, Livestock and Food
MEM	Ministry of Energy and Mines
NGO	Nongovernmental organization
OAS	Organization of American States
OCREN	Oficina de Control de Reservas de la Nación [National Reserves Monitoring Office]
PROGETTAPS	Proyecto de Generación y Transferencia de Tecnología Agropecuaria y Producción de Semillas [Project to Create and Transfer Farming and Seed Production Technology]
PROLAC	Empresa de Productos Lácteos de Asunción [Asuncion Dairy Products Company]
SIGAP	Sistema Guatemalteco de Areas Protegidas [Guatemalan System of Protected Areas]
UNEPROCH	Executing Unit for the Project on Management and Conservation of Renewable Natural Resources in the Upper Chixoy River Valley
USAID	United States Agency for International Development
USPADA	Unidad Sectorial de Planificación Agropecuaria y de Alimentación [Sectoral Agricultural Planning and Food Unit]



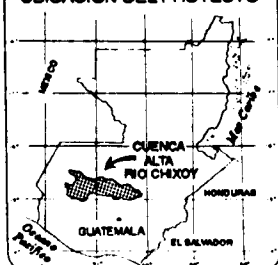
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SIGNOS CONVENCIONALES

- CABECERA DEPARTAMENTAL, MUNICIPAL
- ALDEA O CASERIO
- RIO PERENNE
- RIO INTERMITENTE
- EMBALSE HIDROELECTRICA
- LMITE DE LA CUENCA ALTA
- LMITE DE SUBCUENCAS

NOTA: La base cartografica, con las anotaciones que figuran en la misma, ha sido proporcionada por el Instituto Geografico Militar (IGM) y la Secretaria General de la OEA.

UBICACION DEL PROYECTO



LEYENDA

- MANEJO FORESTAL EXTENSIVO
- PROGRAMA AGROPECUARIO Y CONSERVACION DE SUELOS
- MANEJO DE PROTECCION
- MANEJO FORESTAL INTENSIVO
- ZONA DE SISTEMAS AGROFORESTALES

REPUBLICA DE GUATEMALA

PROYECTO DE MANEJO Y CONSERVACION DE LOS RECURSOS NATURALES DE LA CUENCA ALTA DEL RIO CHIXOY

UBICACION DE METAS



GOBIERNO DE GUATEMALA
BANCO INTERAMERICANO DE DESARROLLO (BID)

Basic Socioeconomic Data of Guatemala

1. General Data

Total Population (Thousands, 1990)	9,200.0
Urban Population (Percentage, 1990)	39.4
Area (Thousands of Km2)	108.9
Population Density per Km2	84.5
Population per Arable Land	279.6
Population Growth Rate (1990)	2.9
Gross Domestic Product per Capita (1990 Dollars of 1988)	892.0
Death Rate per 1,000 Inhabitants (1989)	7.5
Infant Mortality per 1,000 Live Births (1989)	46.6
Life Expectancy (1989)	62.6
Population per Physician (1986)	2,180.0
Population per Hospital Bed (1986)	600.0
Literacy (1989) (Percentage)	57.9
Primary School Enrollment (Percent, 1987)	76.0
Railroad (Km) (1979)	922.0
Electrical Energy Consumption per Inhabitant (Kwh) (1984)	183.0
Exchange Rate (Quetzales per Dollar January 1991)	5.5
Low Income Level, (Annual Income per Person in Quetzales) (December 1990)	3,451.0

<u>Labor Force by Sector (1987)</u>	<u>Thousands of Persons</u>	<u>Sector Share</u>
Agriculture y Fishing	1,372.6	50.6
Mining	2.8	0.1
Industry	334.7	15.9
Construction	93.9	3.5
Public Utilities	10.5	0.4
Commerce and Finance	362.9	13.4
Transport	53.6	2.0
Services	412.2	15.2
Other	66.8	2.5
<u>T o t a l</u>	<u>2,710.0</u>	<u>100.0</u>
Open Unemployment (1989)	218	7.8
Underemployment (1989)	990	35.4

Family Income Distribution (1980/1981)

<u>Percentage of Families (Deciles)</u>	<u>Share Total Income (%)</u>	<u>Average Monthly Family Income (US\$)</u>
Lower	2.4	61
11 - 20	3.1	79
21 - 30	3.7	94
31 - 40	4.9	125
41 - 50	5.9	150
51 - 60	6.3	160
61 - 70	8.6	219
71 - 80	10.1	257
81 - 90	14.2	361
Upper	40.8	1037
Total	100.0	

Source: SEGEPLAN and General Directorate of Statistics, National Household Survey of Income and Expenditures 1979-81.

	P e r c e n t a g e s							Annual Growth Rate ^{2/}					
	1984	1985	1986	1987	1988	1989	1990 ^{a/}	1984	1985	1986	1987	1988	1989
Gross Domestic Product													
Expenditure													
(At Market Prices) ^{1/}													
Gross Domestic Product	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.5	-0.6	0.1	3.5	3.9	4.0
Gross Domestic Investment	11.6	11.5	10.3	13.9	13.7	13.5	14.4	6.1	-19.2	0.2	32.5	-1.0	-2.0
Consumption	90.6	90.1	88.2	92.5	92.1	91.7	89.7	1.2	-0.5	1.2	4.2	4.2	2.9
Exports of Goods + NFS	13.3	18.5	16.1	15.8	16.1	17.3	19.5	-3.2	3.1	-14.0	6.0	5.6	13.3
Imports of Goods + NFS	15.5	20.1	14.6	22.3	21.9	22.5	23.6	7.2	-12.9	-14.7	47.8	3.8	5.6
By Sector ^{2/}													
Agriculture	25.6	25.9	25.6	25.7	25.8	25.7	25.7	1.6	0.4	-0.8	3.9	4.5	3.6
Mining	0.3	0.2	0.3	0.3	0.3	0.3	0.3 ^{a/}	-18.9	-14.0	29.6	-0.1	2.6	4.9
Manufacturing	15.9	15.8	15.9	15.7	15.4	15.2	14.9	0.5	-0.8	0.7	2.0	2.2	2.1
Construction	1.8	1.7	1.7	1.9	2.1	2.4	2.2	-28.4	-8.4	3.1	14.5	15.7	11.9
Transport & Communications	7.0	7.1	7.2	7.3	7.3	7.5	7.7	3.3	1.7	0.4	4.8	4.3	7.5
Commerce	26.2	25.4	24.9	24.7	24.6	24.5	24.6	1.1	-3.4	-2.2	3.0	3.1	4.0
Government	6.4	6.5	6.8	6.9	6.9	6.8	6.8	2.0	1.7	3.9	5.4	3.9	3.3
Financial Services	8.7	8.9	9.2	9.1	9.0	9.0	9.0	0.4	2.1	2.4	2.5	3.4	3.2
Other Services	6.3	6.4	6.3	6.2	6.2	6.2	6.2	0.3	0.4	-0.8	1.8	3.6	3.3

^{1/} Current prices.

^{2/} Constant prices 1958.

^{a/} Preliminary

Source: Bank of Guatemala.

	1984	1985	1986	1987	1988	1989	1990 ^{a/}	Annual Growth Rate
Exports of Goods (FOB)	1,132.2	1,059.7	1,043.8	977.9	1,073.3	1,126.2	1,211.3	-6.4
Traditional	571.8	651.9	656.4	511.0	593.1	611.4	610.7	14.0
Coffee	360.6	451.5	502.3	354.3	386.8	379.9	316.0	25.2
Cotton	72.3	73.1	24.3	16.2	36.9	27.7	24.9	1.0
Sugar	71.3	46.4	51.7	51.4	78.0	92.2	1,152.9	-34.8
Banana	54.9	70.9	73.4	74.6	76.6	87.1	86.2	29.1
Meat	12.7	10.0	4.7	14.5	14.8	24.5	30.7	-21.3
Traditional I/	560.4	407.8	387.4	466.9	480.2	514.8	600.6	-27.2
Imports of Goods (CIF)	1,278.5	1,174.8	959.5	1,447.2	1,557.0	1,641.0	1,660.5	-8.1
Consumer Goods	263.8	224.9	159.0	254.6	281.7	313.2	317.1	-14.7
Intermediate Goods	507.8	474.4	493.8	672.2	722.7	766.3	747.1	-6.6
Capital Goods	146.6	153.8	174.0	342.7	345.9	352.3	319.3	4.9
Lubricants & Fuel	300.1	267.7	93.8	0.0	4.9	4.6	4.2	-10.6
Construction Materials	3.8	3.6	0.1	0.0	91.0	85.6	86.8	-10.6
Other	56.4	50.4	38.8	72.7	91.0	85.6	86.8	-10.6
Services	290.2	30.6	-356.1	-249.0	-260.8	-280.5	-293.4	-23.0
Transfers	30.6	28.7	372.5	313.9	63.2	462.2	402.1	5.5
Total Account (Net) I/	312.0	312.0	372.5	313.9	63.2	462.2	402.1	5.5
Increase in Reserves	-51.0	-10.6	-111.2	-112.9	53.0	141.4	-71.7	-1.4
Balance of Payments	1983	1984	1985	1986	1987	1988	1989	1990

	Percentage of GDP							a/
	1983	1984	1985	1986	1987	1988	1989	
Central Government Finances								
Current Revenues	7.8	7.3	7.7	8.9	9.4	10.1	9.5	8.0
Tax Revenues	6.1	5.7	6.1	7.0	8.1	8.7	7.8	6.9
Current Expenditure	7.8	8.1	7.5	8.9	9.7	10.1	10.1	9.2
Current Savings	-0.1	-0.8	0.2	0.0	-0.3	0.0	-0.6	-1.2
Capital Expenditure	3.4	2.8	2.0	1.8	2.1	2.5	2.3	1.5
Deficit	-3.6	-3.7	-1.8	-1.5	-1.3	-1.4	-2.9	-2.7
Financing	3.6	3.7	1.8	1.5	1.3	1.4	2.9	2.7
Internal	2.7	3.5	1.1	0.9	0.8	0.7	2.5	2.3
External	0.9	0.2	0.7	0.6	0.5	0.7	0.4	0.4

eliminary.

: Bank of Guatemala.

	Millions of Quetzales							Annual Growth Rate				
	1984	1985	1986	1987	1988	1989	1990 a/	1985	1986	1987	1988	1989
Monetary Survey												
Net Foreign Assets	-459.8	-334.3	-224.0	-305.2	-41.1	49.7	71.2					
Domestic Credit	3,519.5	3,829.3	3,560.2	3,759.7	4,060.3	4,551.9	5,461.6	8.8	-7.0	5.6	8.0	12.1
Public Sector	1,574.4	1,723.9	1,263.0	997.4	887.1	1,057.9	1,087.0	9.5	-26.7	-21.0	-11.1	19.3
Private Sector	1,867.8	2,037.1	2,242.1	2,711.2	3,109.2	3,427.1	4,299.9	9.1	10.1	20.9	14.7	10.2
Other Banking Inst.	77.3	68.3	55.0	51.1	64.0	66.9	74.7	-11.6	-19.5	-7.1	25.2	4.5
Liquidity	2,399.1	3,192.9	3,875.1	4,167.8	499.5	5,800.6	7,296.3	33.1	21.4	7.6	19.8	16.1
Money	869.4	1,346.5	1,608.4	1,765.6	2,019.0	2,437.8	3,241.5	54.9	19.5	9.8	14.3	20.7
(Percentage of GDP)	(9.2)	(12.0)	(10.2)	(10.0)	(9.8)	(10.3)	(9.5)					
Quasi-Money	1,529.7	1,846.4	2,266.7	2,402.2	2,976.0	3,362.8	4,054.8	20.7	22.8	6.0	23.9	13.0
(Percentage of GDP)	(16.2)	(16.5)	(14.3)	(13.6)	(14.5)	(14.2)	(11.9)					

eliminary.

: IMF. International Financial Statistics, April 1991 and Bank of Guatemala.

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<u>P r i c e s</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u> ^{a/}
(Rate of Growth)										
GDP Deflator (Base 1958 = 100)	8.5	5.0	6.5	4.1	18.7	40.5	7.7	11.7	11.9	25.1
Consumer Prices (1975 = 100)	11.4	0.2	4.5	3.4	18.7	37.0	12.3	10.8	11.4	41.2

Source: IMF. International Financial Statistics, March, 1989 and Bank of Guatemala.

	<u>Millions of Dollars</u>							
<u>Total External Debt</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
<u>Disbursed Debt</u>	<u>1,537.3</u>	<u>1,799.4</u>	<u>2,353.0</u>	<u>2,623.0</u>	<u>2,753.0</u>	<u>2,770.0</u>	<u>2,577.0</u>	<u>2,601.0</u>
<u>Debt Service Actually Paid</u>	<u>148.4</u>	<u>188.7</u>	<u>272.0</u>	<u>333.7</u>	<u>364.0</u>	<u>339.0</u>	<u>379.0</u>	<u>289.0</u>
Interest as a Proportion of Exports of Goods and Non Factor Services	7.9	8.7	12.3	14.9	17.4	13.6	13.9	11.3

Preliminary.
Not available.

Source: World Bank.

9. <u>IDB Loans</u> (Approved by December 1990)	<u>Millions</u> <u>of Dollars</u>	<u>Percentage</u> <u>of Total</u>
<u>By Source of Funds</u>	<u>1,157.6</u>	<u>100.0</u>
Ordinary Capital	552.2	47.7
Fund for Special Operations	544.7	47.1
Social Progress Trust Fund	28.3	2.4
Administrative Funds	32.3	2.8
<u>By Sector</u>	<u>1,157.6</u>	<u>100.0</u>
Agriculture and Fishing	151.0	13.0
Industry and Mining	199.1	17.2
Tourism	5.1	0.4
Transport and Communications	167.0	14.4
Energy	299.1	25.8
Education, Science and Technology	30.1	2.6
Urban Development	81.3	7.0
Public Health	223.1	19.3
Export Financing	1.9	0.2

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GUATEMALA

MANAGEMENT AND CONSERVATION OF RENEWABLE NATURAL RESOURCES IN THE UPPER CHIXOY RIVER VALLEY

(GU-0064)

I. BASELINE DATA ON THE OPERATION

- 1.1 Borrower. The Republic of Guatemala, which will also be responsible for providing the local counterpart for the project.
- 1.2 Executing agency. The Ministry of Agriculture, Livestock and Food, through the executing unit for the upper Chixoy River valley management project (UNEPROCH) which has been created expressly for this purpose. The unit will act as coordinator and administrator for the activities of the different Ministry agencies, the National Electrification Authority (INDE), the Agricultural Science and Technology Institute (ICTA), and local and international nongovernmental organizations that are expected to take part in implementing the project.
- 1.3 Request. On July 19, 1990, the Ministry of Public Finance requested a loan from the Bank to execute the project. On the same occasion, the government stated that it attached high priority to this project, on the basis of a technical and financial report issued by the General Secretariat of the Economic Planning Council.
- 1.4 Objectives. By taking steps to administer renewable natural resources, the project seeks to contribute to the comprehensive management of the upper Chixoy River valley, and its specific objectives are: (i) to improve farming, forestry and grazing productivity by introducing appropriate soil and water conservation techniques; and (ii) to reduce the rates of deforestation, erosion and sedimentation that affect farm, forest and livestock production and threaten to reduce the useful life of the infrastructure in the area, particularly the Pueblo Viejo-Chixoy hydroelectric plant.
- 1.5 Description. Four basic interrelated components are proposed to attain the objectives in question: (a) soil conservation and the promotion of agriculture; (b) management of forests and protected zones; (c) rehabilitation of gully erosion; and (d) creation of a system for research, project follow-up and evaluation, and preparation of a study on pre-Hispanic archaeological sites.
- 1.6 Program risks. Although there are a number of sociocultural and economic factors which indicate that the project will be a success, there are certain limiting factors and institutional and social risks that might affect it: (i) project execution requires adequate interinstitutional coordination. UNEPROCH has been made

responsible for this aspect, and will establish the legal mechanisms to define the role of each participating organization through agreements and contracts; (ii) extreme poverty is a limiting factor since it may stand in the way of the community's willingness to perform work that does not appear to be directly productive. However, it is believed that social incentives will encourage community participation in project activities; (iii) sociopolitical conflicts in some communities (particularly in critical subbasins of the Quiché) currently pose difficulties for project execution. Consequently, work will only be done in communities that express their willingness to participate; (iv) inter-ethnic conflicts may make project acceptance difficult because non-indigenous technicians are often viewed with suspicion or mistrust, owing to the long history of under estimating of and discrimination against native peoples. The use of agricultural representatives who are native to the region will solve this problem.

- 1.7 Cost and financing. The total project cost has been estimated as equivalent to US\$17.9 million. It is proposed that the Bank finance the equivalent of US\$14.4 million in foreign exchange from the Fund for Special Operations, for 80% of the total cost. The government will provide the remaining 20% as the local counterpart, equivalent to US\$3.5 million.
- 1.8 Terms and conditions. The terms and conditions of the financing requested from the IDB are: (i) amortization period: 40 years, including a 10-year grace period; (ii) disbursement term: six years; (iii) interest of 1% a year during the grace period, and 2% during the amortization period; (iv) a credit fee of 0.5% on the undisbursed balance; and (v) inspection and supervision fee of 1% of the total loan.
- 1.9 Exceptions to Bank procedures: The program has the following special contracting procedures that are exceptions to customary Bank practice:
 - a. Contracting the agricultural studies. It is proposed to directly contract the Agricultural Science and Technology Institute (ICTA) to conduct the studies on soil fertility, run-off and erosion and the technology trials described in paragraph 4.52. The contract is worth the equivalent of US\$1.2 million. ICTA is a decentralized institution with links to the MAGA and is responsible for generating and promoting the use of agricultural technology.
 - b. Contracting labor. The program plans to hire community labor directly for a sum equivalent to US\$2.7 million to work on agricultural and forestry demonstration plots and to prevent gully erosion.
 - c. Contracting nongovernmental organizations (NGOs). The services of NGOs that are working in the zone will be contracted for

extension activities, forest management promotion, and supervision of the distribution and installation of improved stoves. The cost of these contracts will be approximately US\$2.3 million equivalent.

- 1.10 General appraisal of the project: The project is very important for the nation and its effects on the indigenous rural population in the high plateau will be marked and far-reaching. The priority attached to managing the natural resources of the upper Chixoy River valley is supported by the nature of the components, since they are intended to raise the standard of living of the population, which is mostly indigenous, and whose livelihood depends on subsistence farming and woodland grazing; the special attention paid to training for rural women and their participation in the project; the importance attached to environmental protection and improvement; the strategy of local participation through training for rural leaders who will act as extension workers for the program; and the use of organized community groups and nongovernmental organizations.
- 1.11 During the feasibility study it was found that, in the light of existing erosion levels in the upper valley and the sedimentation process in the reservoir, on the one hand, and the precautions taken during construction of the hydroelectric plant by creating a large reservoir below the level of the water intake ("dead reservoir") on the other, the short-term risk of a significant economic impact owing to reductions in electricity production is minimum. That impact will become significant if large volumes of sediment are allowed to accumulate over the medium term, but its economic quantification in terms of present value is marginal according to the methodologies used.
- 1.12 Based on the results of the missions and the detailed analysis of the proposed project, it has been found to be feasible from the technical, environmental, economic, institutional, financial and legal standpoints. The proposed plan of execution is supported by the authorities of the institutions involved, who have agreed on the conditions under which each of them will participate in project execution.

II. REFERENCE FRAMEWORK ^{1/}

A. The environment and renewable natural resources

1. National situation

- 2.1 Guatemala is estimated to have a population of nine million, with an approximate density of 85 people per square kilometer. It has the largest population in Central America and is second in population density. It has the highest percentage of rural population in the region (56%). About 50% of its population is indigenous, and 73% of these native peoples live and work in rural areas.
- 2.2 Owing to the country's population growth, estimated at 2.6% a year, and inadequate land distribution, the pressure on natural resources (land, water and forests) has gradually been mounting. Lack of planning and the use of inadequate production techniques have contributed to the degradation of natural resources, threatening the likelihood of sustainable development.
- 2.3 The fragile balance between demand for natural resources and their availability has often been disturbed, leading to conflicts in which the poorest groups in society are the hardest hit. It is these groups that depend most directly on the quality and availability of natural resources. In this context, extreme poverty emerges as the main protagonist in the rural areas. In Guatemala, 83.7% of the rural population lives in a state of poverty, while 51.5% of the total are critically poor.
- 2.4 The state of the agricultural sector is one of the most serious constraints on the country's development. The sector is not in a position to absorb more labor because the farmers' low incomes do not allow them to create a consumer market, the best land is already in use, and the agricultural frontier is expanding into areas that are generally not suited for farming, where conversion of forests into farmland is causing serious ecological changes.
- 2.5 According to reports on the country's environmental situation, the major problems caused by current patterns of resource use are: (a) deforestation at an estimated rate of 90,000 ha a year, equivalent to 2% of the surviving forests; and (b) soil erosion caused by deforestation, tilling on steep slopes and the absence of soil conservation practices, the high susceptibility of land to erosion (over 60% of the country's land is highly or very highly susceptible), and failure to use land to its full potential.

^{1/} The recent economic situation and future prospects are discussed in Annex II-1.

2. Natural resource and environmental policies

- 2.6 Until 1986 there was no comprehensive legislation on the use and conservation of natural resources in Guatemala, although there were specific laws that dealt with those resources. Since the promulgation of the Environmental Protection and Improvement Act in that year, renewable natural resources have been given comprehensive treatment, principles have been established for the rational use of plants, animals, land, subsoil and water, and the National Environmental Commission (CONAMA) has been created as the institution responsible for enforcing them. The Protected Areas Act was promulgated in 1989, and the National Council for Protected Areas (CONAP), the Guatemalan System of Protected Areas (SIGAP), and the National Watershed Management Commission (CONANCUEM) were created.
- 2.7 Institutional efforts for watershed management in Guatemala have, by and large, been dispersed with little coordination and with obvious duplication. Since 1987 the Regional Watershed Management Project (PMRC) of the Tropical Agricultural Research and Teaching Center (CATIE) has been encouraging government institutions to work together and coordinate their capacity for watershed management, and has offered technical assistance and human resource training programs.

B. The project region

- 2.8 The upper Chixoy River valley lies in the central part of Guatemala, runs for 5,494 km² up to the site of the Pueblo Viejo dam, and constitutes 5% of the country's total area. Administratively, it is divided into 32 municipal jurisdictions in six departments and three regions.

1. Biological and physical characteristics

- 2.9 The area is located in two large physiographic areas: the high crystalline lands between the large Polochic and Motagua faults; and the high sedimentary lands that cover a complex diversity of land forms such as the Chamá and Cuchumatanes sierras. The basin's topography is mainly mountainous and rugged with steep banks and deep valleys.
- 2.10 The climate varies widely, and certain areas have their own particular microclimates. Average precipitation is 1,200 mm, ranging from extremes of 824 mm in Sacapulas to 5,222 mm in Quixal. The low values predominate in the watershed; the high values are found in the low-lying wetlands of the north. The rainy season lasts from May to October when 94% of annual rainfall occurs. Average temperatures range from 12°C to 24°C, with slight annual variations.
- 2.11 The drainage system is controlled mainly by faults and fractures and the main watersheds follow the Polochic fault system. Only the

Serchil and Pacaranat rivers exhibit lithologic influence in their drainage. Average flow in the watershed is $57 \text{ m}^3/\text{sec}$, which corresponds to a yield of $10 \text{ l}/\text{sec}/\text{km}^2$.

- 2.12 The geology and lithology in the basin are extremely varied. The average rate of soil loss is $2,885 \text{ ton}/\text{km}^2/\text{year}$ or 15.8 million tons a year, which is twice as high as the estimated national average.
- 2.13 Sedimentation in the watershed has been measured at several hydro-metric stations and through two depth soundings at the Pueblo Viejo reservoir. On the basis of on this information, it is estimated that the annual sedimentation rate is $700 \text{ ton}/\text{km}^2/\text{year}$, for an accumulation of 3.8 million tons a year in the reservoir.

2. Socioeconomic characteristics and infrastructure

- 2.14 1989 data estimated that 479,000 people live in the watershed, 85.7% of them in rural areas. Average population density is $96/\text{km}^2$, but distribution is not uniform and the heaviest concentration occurs in the high plateau. Also, 57.3% of the population is under 20 years of age, 60.4% are illiterate, and native peoples predominate. The economically active population (EAP) in the area is 26%, and 92.4% of those are men.
- 2.15 Data on agrarian structure from the 1979 census show that most farms in the area are dwarf holdings, with 92% less than 7 ha in size. They cover 33% of the area. At the other extreme, large properties account for 0.74% of farms, but cover 31% of the area. The predominating form of land tenancy is private individual ownership, which applies to 87.6% of the farms. Most farms are worked individually (99.4%).
- 2.16 Farming centers on corn, which is grown on 97% of the farms and covers 67% of the area devoted to annual crops. Yield in this zone is 23% lower than the national average. The second largest crop is beans, which are planted on 43.5% of farms, mostly in association with corn. The yield is also 23% lower than the national average. Other less important crops are grown such as wheat, potatoes, sorghum, millet, broadbeans, groundnuts and peas; garden crops include onions, garlic and tomatoes. Permanent crops include coffee, deciduous fruit, citrus fruit and avocados.
- 2.17 Livestock production accounts for 18.4% of the gross product in the region. Twenty-six percent of farms raise dual-purpose cattle (meat and milk) and native breeds. Hog farming is fairly important: 57% of the farms raise pigs, for an average of 2.4 head per farm. Poultry is raised on 83% of the farms, with an average of 11.5 birds each. The sheep population is large, estimated at 90,000 head; they graze uncontrolled over extensive areas.

- 2.18 Natural forests are composed of conifers and broad-leaved trees. Forests of pure conifers and mixed forests of conifers and broad-leaved trees predominate, with some mixed broad-leaved forests. Logging is mostly selective, culling the most valuable materials. This quickly results in a very poor remnant forest that genetically degrades the forest mass.
- 2.19 The watershed's roads are few and of poor quality. It is estimated that there are a total of 1,000 km of roads, only 183 km of which are paved, while most are feeder roads built in areas with very uneven terrain.

3. Sociocultural characteristics 2/

- 2.20 According to the 1981 census, 72% of the population in the watershed is indigenous. This figure, which is probably underestimated owing to the criteria used to establish ethnic origin, is substantially higher than the national average of 50%. Moreover, in some municipalities or communities in critical subbasins there are significant numbers of people with mixed blood.
- 2.21 There is considerable diversity among the ethnic groups in the region, which include Quichés, Mames, Aguatecos, Ixiles, Uspantecos and Pocomichies, who belong to Guatemala's three main ethno-linguistic groups. Quiché-speaking groups predominate in the area, although there is a wide variety of dialects. These native peoples' shared cosmogony and ecoculture give them a deep sense of belonging and interdependence. Despite changes and diversification in their farming practices over time, for these groups corn continues to be the main focus of a complex world view, according to which it is infused with life, the provider of all food and goods, and represents the most powerful god in their religion.

4. Land: capacity, coverage and current use

- 2.22 Land use classification indicates that 11.4% (622 km²) belong to categories II, III and IV, which is land with constraints on agricultural use and is mainly concentrated in the subbasins of the Salamá and Chicruz rivers. The recommended use for V and VI are limited to perennial crops and pastures, and occupy 14.4% of the area (785 km²). VII, whose use is limited to pasture land and forests, accounts for 67.5% of the area (3,677 km²). VIII accounts for 6.7% of the area (368 km²) whose extreme limitations restrict the use of such land to protected areas, recreation and wildlife.
- 2.23 Actual land use involves 802 km² for farming (14.6%), 2,191 km² of forests (40%), 1,592 km² of pastures (29%), 593 km² of open forest-farming (10%), and 366 km² of open forest-natural pasture (6.6%).

2/ See Annex II-2.

- 2.24 A comparison of the information on land capacity and actual use points to the conflicts and competition that exist in the watershed. Thirty-seven percent of VI, VII and VIII has adequate forest cover, 16% has mixed trees, pastures and crops, while the remaining 47% has no forest cover. At the other extreme, II, III and IV have 60% forest cover. These results paint a grave picture of the state of natural resources in the watershed, since 57% of the area is used for purposes that are not suited to its capacity, without technology or practices to surmount this problem.

C. Previous IDB operations

- 2.25 This will be the first Bank operation involving watershed management in Guatemala. From 1961 to date, the Bank has participated in financing 15 agricultural projects worth the equivalent of US\$161.6 million. Of this total, ten loans worth US\$102.9 million have been used for credit programs for small and medium-scale farm producers.

IDB OPERATIONS IN THE AGRICULTURAL SECTOR						
Number	Executing unit	Purpose	Approval years	Loan	Disburs.	Doc eval.
58/SF-GU	SCICAS ^{a/}	Credit	14.II.63	2.5	2.5	PR-839 and 1066
81/OC-GU	BANGUAT	Credit	10.VII.61	5.0	4.7 ^{b/}	PR-839 and 1066
133/OC-GU	BANGUAT	Credit	09.VIII.66	3.2	2.8 ^{b/}	PR-839 and 1066
105/SF-GU	BANGUAT	Credit	09.VIII.66	2.0	2.0	PR-839 and 1066
106/SF-GU	BANGUAT	Credit	09.VIII.66	0.8	0.8	PR-839 and 1066
162/SF-GU	DIRENARE	Small & med. irrigation	19.XII.67	6.0	6.0	PR-839 and 1066
204/SF-GU	SCICAS	Credit	23.I.69	4.5	4.5	PR-839 and 1066
410/SF-GU	BANDESA	Credit	23.IX.74	4.4	2.2 ^{b/}	PR-1066
460/SF-GU	BANDESA	Credit	15.I.76	15.0	15.0	PR-1066
630/SF-GU	BANDESA	Credit	13.XI.80	25.5	25.5	PR-1530
667/SF-GU	PRODESA	Animal health	19.XI.81	16.7	15.3 ^{c/}	PCR in preparation
443/OC-GU	MCTOP/ SEGEPLAN	Marketing	22.IX.83	11.5	8.2 ^{c/}	PCR in preparation
473/OC-GU	ICTA/ DIGESA/ DIGESEFE	Technol. generat. & transfer	16.V.84	13.9	7.0	In execution
529/OC-GU	BANGUAT	Credit	16.XII.86	40.0	14.6	In execution
817/SF-GU	MAGA/ DIRYA	Small & med. irrigation	02.III.88	10.6	1.1	In execution
Totals				161.6	112.2	
^{a/} Inter-American Cooperative Service for Supervised Agricultural Credit. ^{b/} Undisbursed balance, canceled. ^{c/} Undisbursed balance to be canceled.						

D. Activities by other bodies

- 2.26 No specific watershed management programs have been financed by multilateral or bilateral agencies. Secondary components related to soil conservation and the establishment of farm-forestry systems have been included in some agricultural projects, such as the USAID

High Plateau Agricultural Development Project, and the Los Cuchumatanes Project to be cofinanced by IFAD and the Government of the Netherlands in 1992.

E. Project design

1. Background

- 2.27 Concern over the management of the Chixoy River valley, associated with erosion problems, was expressed in the preinvestment studies conducted by consultants at the beginning of the 1970s, and was restated subsequently in the studies conducted by consultants and employees of the National Electrification Authority (INDE), which have repeatedly warned of the extent of the erosion process.
- 2.28 In 1987 INDE, the Ministry of Agriculture, and the former National Forestry Institute, today the Directorate General of Forests (DIGEBOS), prepared a prefeasibility study for a project to manage the renewable natural resources in the upper Chixoy River valley. The document was submitted to the Bank with a request for financing for feasibility studies.
- 2.29 In 1988, through a joint effort by the Organization of American States and the Bank, technical and financial resources were allocated for a feasibility study under technical cooperation ATN/SF-3112-RE.
- 2.30 The feasibility study consists of a proposal to manage the basin on a scale of 1:250,000, which pinpoints activities in space and time to balance resources with production technologies and strategies to encourage active participation by the resident population. It establishes a system of action priorities that focuses on extension activities and transfers of technology aimed at modifying crop, livestock and forestry practices by introducing improved systems which, without neglecting the needs of the population, will ensure better management of natural resources.

2. Nature of the problem

- 2.31 Occupation of the Guatemalan high plateau has speeded up markedly in this century. The forests have been disappearing owing to expansion of the agricultural frontier, population growth, logging and the consumption of firewood. The loss of plant cover, overgrazing and poor farming practices on steep slopes contribute to the mechanism that has made much of the land unproductive, impoverished the rural population and generated higher migration to urban areas.
- 2.32 Rill and sheet erosion in the watershed is serious and is directly related to loss of forest cover and land use. The land is being rapidly depleted and the average rate of soil loss has been calculated at 2,885 ton/km²/year. It is estimated that a 7.5 mm

layer of soil is lost each year, and since most of the soil cover is less than 20 cm deep, the arable layer will disappear in 100 years.

- 2.33 Despite the high deforestation rate, estimated at between 1.5% and 2% a year, the remaining forest is still significant, covering 40% of the area. This resource is used without the application of management plans, the best trees have been felled, and the forest is becoming seriously degraded in genetic terms.
- 2.34 Farm production possibilities are considerable in the Salamá and Chicruz area, as well as in the valleys in the high plateau. In addition to these factors, the Chixoy watershed is Guatemala's main source of hydroelectric energy, which was first tapped with the construction of the Pueblo Viejo dam. Studies are being conducted on comprehensive development of the watershed's hydroelectric potential, with sites identified at Serchil, Tapezcos and Jocotales.

3. Necessary actions

- 2.35 The renewable natural resources and hydroelectric potential in the watershed and current sociocultural problems point to the need for programs to manage the watershed. The activities in question will promote the sustained use of natural resources to raise the standard of living of the resident population, the majority of whom are native peoples that depend on subsistence farming and woodland grazing, and guarantee the best possible operation of the Pueblo Viejo plant and the future hydroelectric projects to be built in the watershed.
- 2.36 To achieve this, it will be necessary to obtain active participation by grassroots organizations, communities, cooperatives, and improvement-minded committees, whose numbers are significant in the watershed. Work must also be done on strengthening the local institutions responsible for managing renewable natural resources, gaining the experience and operational capacity needed to shoulder similar responsibilities in other watersheds of interest to the nation.
- 2.37 Priority must be given to assisting very small farmers who are forced to farm land with marginal agricultural vocation are mostly illiterate, and who have not received support with regard to the adequate use and management of the land and the forests that are their only asset and the basis of their survival.
- 2.38 The actions will include programs for intensive and extensive forest management. Intensive management programs will allow for comprehensive and sustainable use. Extensive management will be proposed for the remaining areas to protect the forest, rationalize logging by culling only diseased or over-mature trees for direct use by the community. Attention must also be paid to the problems

of illegal logging, forest fires, pests and diseases, so that the forest products demanded by the population will, in fact be available. The use of firewood must be rationalized, and areas that have been extremely degraded by intensive erosion must be rehabilitated.

- 2.39 For surveillance and control of protected zones, management plans must be drawn up for the protected multiple-use zone of Los Cuchumatanes and for the zone immediately adjacent to the Pueblo Viejo reservoir, where steps should be taken immediately.
- 2.40 The size, extension and severity of the problems in the watershed, in contrast with limited institutional capacity, social organization and financial resources, mean that the measures to be taken must be ranked in order of priority to focus on farming and forestry programs that will yield the highest social, economic and environmental benefits.

III. THE PROJECT, COMPONENTS, COST AND FINANCING

A. Objectives and description

1. Objectives

- 3.1 The objective of the project is to contribute to the management of renewable natural resources and the development of the rural population in the upper Chixoy River valley by: (i) establishing systems that increase productivity and permit the sustained use of the renewable natural resources required for crop and livestock farming and forestry activities; (ii) reducing the rates of deforestation, erosion and sedimentation that affect such uses, the working life of the Pueblo Viejo dam, and other infrastructure in the area.

2. Description

- 3.2 To attain those objectives, the project includes four basic interrelated components:

- a. soil conservation and agricultural promotion;
- b. forestry and management of protected areas;
- c. rehabilitation of gully erosion; and
- d. research, follow-up, evaluation and studies.

a. Soil conservation and agricultural promotion 3/

- 3.3 The physical goals of this component are: assistance for 12,250 farms covering a total area of 21,700 ha, with soil conservation works and sustainable farming practices on 7,000 ha of steep land, and management and improvement of pastures on 1,630 ha used for livestock farming.
- 3.4 Three types of conservation works will be undertaken in keeping with the different production systems and soil characteristics in the zone: (1) banked terraces (390 ha) to be built for production systems that include high-value marketable crops such as potatoes, cauliflower, cabbage, garlic and onions; (2) integrated systems (5,980 ha) that combine the construction of conservation works (windrows, banks and living barriers) with farming practices; and (3) special integrated systems (660 ha) that also include the construction of dead barriers (mechanical protection works) using materials that are abundant in the zone (stone, wood and tuft).
- 3.5 The soil conservation program is closely linked to promotion and extension activities whose purpose is to improve production systems

3/ A summary of the goals appears at Annex III-1.

through four main elements: (1) introduction of improved seed in cases in which trials have been conducted for the zone; (2) introduction and improvement of conservationist, energy-saving farming practices, such as minimum tilling, use of stubble and plant cover materials; (3) creation of farm-forestry-grazing systems with the use of living barriers of grasses and forage crop trees, the planting of trees for fuel, introduction of semi-permanent crops in association with annual crops; and (4) construction of soil conservation works.

- 3.6 The direct beneficiaries will be rural families that work dwarf farms or subfamily subsistence farms of under 7 ha, with minimum areas devoted to tilling on steep slopes. They are located in five subbasins identified as priorities in function of the high erosion rates detected by the geomorphological studies, and the analysis of land-use patterns.
- 3.7 Technical support will be provided by six trained farm extension workers. One extension worker will be assigned to each of the program's six field offices. Four livestock extension workers will be available for livestock management, under the direction of an agrostologist-animal breeder.

b. Forestry component and management of protected areas

- 3.8 The forest production component includes four subprograms: (i) forestry and agroforestry extension and demonstration; (ii) forest protection and monitoring; (iii) reforestation and promotion of the use of improved stoves; and (iv) management of protected areas. 4/
- 3.9 The project includes the preparation of management plans for 50,000 ha of forests, the establishment of 190 forest management demonstration plots covering 132 ha, and extension and motivational activities among the beneficiaries (4,600 families living in 115 communities) to promote execution of the management plans.
- 3.10 The project will finance aerial photography on a scale of 1:20,000 over the entire watershed to prepare plans for forest management and fire protection, and establish a data bank for monitoring and control.
- 3.11 Farm-forestry activities will involve about 3,100 beneficiary families. The goal is to establish farm-forestry production systems (combination of trees with crops or livestock production) covering 1,550 ha (0.5 ha per family) for the purpose of generating income for small farmers. To attain this goal, promotion and motivational activities will be carried out and about 80 ha of demonstration plots will be established on approximately 160 farms.

4/ The goals for this component appear at Annex III-2.

- 3.12 Forest protection and control include financing to establish a fire and pest protection system and to control the use of forests over 146,000 ha (including the 50,000 ha for forest management mentioned earlier). The activities include: (i) prevention of fires, pests and forest diseases through education programs, removal of materials that are flammable or contaminated by pests, and opening up fire breaks; and (ii) forest surveillance and fire fighting through the use of eight forest fire observation towers and mobile patrols.
- 3.13 The forest surveillance system in other parts of the Chixoy River valley will also be strengthened, covering a total area of about 310,000 ha.
- 3.14 Reforestation involves the production of plants (2.1 million) to reforest 1,100 ha with community assistance. Six thousand improved stoves will be distributed for demonstration purposes covering 10% of the 60,000 families in the project area that cook with firewood.
- 3.15 Immediate protection and monitoring activities will be financed for the management and conservation of forests and plant cover over approximately 18,000 ha in the zone that drains directly into the Pueblo Viejo reservoir and in the Los Cuchumatanes region in the Blanco river subbasin.
- 3.16 During the first year of execution, the project will provide financing to prepare a management plan for the Los Cuchumatanes multiple-use reserve, and the area adjacent to the Pueblo Viejo reservoir.

c. Gully erosion rehabilitation component

- 3.17 The purpose of this component is to rehabilitate a total of 1,000 ha in different parts of the watershed that are degraded and unproductive and which are currently focuses of erosion that affect production zones and existing infrastructure (basically roads). Small hand-built works will be constructed to halt the erosion process, confine the soil and allow natural vegetation to regenerate. These mechanical works are low in cost since they do not require skilled labor and use local materials and technology.
- 3.18 To protect the land from the creeping action of gullying, preventive works will be built such as absorption ditches, as well as works with a dual corrective and preventive function, such as dead barriers, banks and living barriers. The works will be built with community participation on federal, municipal and community land. A total of 45 km of living barriers 145 km of dead barriers, 37 km of absorption ditches and 350 km of dry walls will be built.

d. Research, follow-up, evaluation and studies component

- 3.19 The purpose of this component is to establish a system for research, follow-up and project impact evaluation by: (a) obtaining basic technical and socioeconomic data for the project; (b) designing and implementing a dynamic information system for feedback and program adjustment, and for project control and coordination; (c) conducting research and trials of farming practices and introducing and adjusting production systems; (d) establishing run-off areas to measure the impact of conservation activities, and installing equipment to measure erosion and sedimentation; (e) studies and special samples of the efficiency of the extension systems and their impact on productivity; (f) validating the hypotheses used in the economic analysis; and (g) archaeological exploration of pre-Hispanic sites.
- 3.20 In this regard, UNEPROCH will: (i) design and implement an evaluation system, which includes a data bank, a geographic information system and preparation of user manuals; (ii) design studies and special samples, including preparation of forms and surveys to obtain information on the different components; and (iii) design, calibrate and operate a mathematical model to simulate the behavior of the geomorphological and hydrological processes in the watershed.
- 3.21 Under the terms of the agreement to be signed, INDE will be responsible for obtaining information on meteorology, hydrology and sedimentology, which will serve as the basis for management and zoning in the watershed, and will include: (i) expanding the weather and water gauging system by constructing seven weather stations and five hydrographic stations; (ii) purchasing equipment to measure sedimentation; and (iii) training two professionals in sedimentation technology.
- 3.22 The Agricultural Sciences and Technology Institute (ICTA), under an agreement to the signed with UNEPROCH, will be responsible for the following:
- (i) specific research and analysis to add to the farming and forestry recommendations and practices that will be disseminated from the start-up of the project;
 - (ii) soil fertility and physical and chemical studies in the different units, establishing a correlation between erosion and the loss of fertility, which will provide fine-tuned information for management recommendations and the correction of limiting factors:
 - (iii) establishment of research plots for studying the impact of rain and run-off on soil displacement, whose results will make it possible to adjust practices and provide basic

information for extending the program into other parts of the watershed and the high plateau;

- (iv) analysis of farm-forestry-livestock systems that will basically include adaptation tests and trials of production systems for the main crops in the area, particularly corn, wheat, beans, broadbeans, garden vegetables, fruits, and podder crops; and
- (v) follow-up and evaluation of the results and analysis of the impact of the practices introduced and the efficiency of promotional activities and transfers of technology.

- 3.23 To surmount one of the main restrictions to the promotion of adequate management of the environment and the use of renewable natural resources, it is necessary to include a component for institutional strengthening and training for the Ministry of Agriculture and Food. Three individual consultants will be engaged for this purpose, who are experts in planning and watershed management, project evaluation and monitoring, and management systems and procedures. The forestry sector will be strengthened by training professionals and rural community leaders abroad.
- 3.24 The large number of pre-Hispanic archaeological sites in the watershed, the limited knowledge about them, and the risk of damage to them by project activities suggest the advisability of carrying out archaeological digs in the zone, and a group of specialized consultants will be hired for this purpose.

B. Scaling the project

- 3.25 Since Guatemala has no experience in executing watershed management projects, and because creation of the project executing unit will require a great deal of interinstitutional coordination, the project has been scaled to involve direct intervention in an area covering 25% of the watershed, and indirect intervention over an additional 26%.
- 3.26 The scaling criteria took the following factors into consideration: (i) the need to reduce the current high rates of erosion; (ii) the presence of large remaining forested areas; (iii) the high concentration of rural inhabitants; and (iv) the extent to which the land has been divided up. Each of these components has been scaled in accordance with the criteria described in the following paragraphs.
- 3.27 Systems that are appropriate for the ecological and social conditions prevailing in each microbasin were chosen for soil conservation and agricultural promotion activities. Technological packages that can be adapted to the zone, the receptiveness of the population, and the response capacity of communities have been proposed. The microbasins with the highest erosion rates, the

largest area under farming, and the highest concentration of small producers were selected.

- 3.28 The proposed agroforestry systems are limited in extent, owing to the lack of national experience in implementing them and potential reluctance by farmers to participate because of their high cost. Areas where the farmers have expressed interest in taking part were selected, where traditional agroforestry systems open to improvement are practiced.
- 3.29 In scaling the forest management goals, consideration was given to quite heavily forested and accessible areas where negative forestry is being carried out, which seriously limits their potential for use. Zones for intensive management were selected on the basis of the interest expressed by the communities in managing them to ease the demand for firewood. Extensive forest management will take place in heavily populated microbasins where the risks of increased erosion will be highest if land that has been logged and burned is not protected.
- 3.30 The reforestation goals are based on the production capacity of the DIGEBOS nurseries and the community nurseries to be established as part of the agroforestry investment project, and the perceived receptiveness of communities that plant trees.
- 3.31 A reduction in firewood consumption will be encouraged with the distribution of improved stoves to 10% of the families in the basin who cook with firewood.
- 3.32 Management of protected natural areas has been scaled on the basis of the need to upgrade plant cover in large areas surrounding the Pueblo Viejo reservoir, which currently have grass and shrub coverage that degrades very easily owing to human activities, particularly, grazing.
- 3.33 The gully erosion rehabilitation component was scaled on the basis of field surveys to determine the most critical sites for small-scale civil works. The cost of some of the works means that they will be built at sites where their direct impact on erosion control is high, and where they will protect existing infrastructure.

C. Project cost and financing

1. Cost

- 3.34 The total project cost is estimated as the equivalent of US\$17.9 million, based on unit prices in the country in July 1990, and an exchange rate of Q 4.3 to US\$1.00.
- 3.35 Local prices were used to obtain the unit costs. Personnel costs were based on the salary scales in effect for public employees in Guatemala, with a post adjustment, corresponding to 60% of the

basic salary, for personnel who will work in the field, which will compensate them for their stay in the project zone and will make it possible to obtain qualified staff for project execution.

- 3.36 Owing to the adjustments deriving from liberalization of the exchange market in November 1989, whose effects may have an impact on price levels, an average index of 3.8% for external inflation has been used for all imported products and for products manufactured in Guatemala from imported raw materials. For local costs, the projections for domestic inflation and devaluation estimated in Memorandum PRA/PAD/099V of May 1, 1991, were applied.
- 3.37 Cost distribution for the four main project components, by source of financing, is shown in the following table:

<p align="center">Table 3.1 Chixoy river basin management project (in the equivalent of US\$ thousands)</p>				
Total per Fund				
Category	FSO	Local	Total	%
1. Engineering and administration	1,340	1,130	2,470	13.8
1.1 Administration	292	1,130	1,422	7.9
1.2 Supervision	1,048	0	1,048	5.9
2. Direct costs	9,410	160	9,570	53.5
2.1 Construction and improvements	4,940	0	4,940	27.6
2.2 Vehicles and equipment	1,020	0	1,020	5.7
2.3 Consulting, training	1,450	30	1,480	8.3
2.4 Studies	2,000	130	2,130	11.9
3. Concurrent costs	370	1,780	2,160	12.1
3.1 Salaries and living allowances	0	1,650	1,650	10.0
3.2 Operating costs	370	140	510	2.1
4. Unallocated	2,660	270	2,930	16.4
4.1 Contingencies	1,000	150	1,150	6.4
4.2 Cost escalation	1,660	120	1,780	9.9
5. Financial costs	620	150	770	4.3
5.1 Interest	476	0	476	2.7
5.2 Credit fee	0	150	150	0.8
5.3 Inspection and supervision	144	0	144	0.8
Total	144,000	3,500	17,900	100.0
Percentage	80	20	100	

2. Description and justification of the investment categories

a. Administration (US\$2,470,000)

- 3.38 This investment category includes: (a) US\$1,130,000 to cover salaries, living expenses and operating costs for the executive and technical directorates and the research, follow up and evaluation unit; (b) US\$292,000 for the vehicles and equipment required for the executing unit, including eight jeeps, six motorcycles, one truck and one mobile publicity unit; and (c) US\$1,048,000 to cover administration and supervision of the NGOs and contracted private firms, in support of the executive and technical departments and execution of the forestry and agroforestry outreach subcomponent and the research, evaluation and studies subcomponent.

b. Direct costs (US\$9,570,000)

- 3.39 (a) Construction and improvements (US\$4,940,000). This category includes costs associated with: (i) civil works to construct the hydrological stations, forestry nurseries and forest fire control towers (US\$160,000); and (ii) labor and inputs for soil conservation works (US\$2,110,000), gully erosion rehabilitation works (US\$910,000), agroforestry extension contracts (US\$1,200,000) and forestry extension and demonstration (US\$560,000).
- 3.40 (b) Vehicles and equipment (US\$1,020,000). Includes the acquisition of: (i) 22 vehicles, 20 motorcycles and 24 bicycles for project field activities (US\$460,000), excluding the vehicles for the executing unit that have already been included in the administration category; and (ii) equipment and tools in the amount of US\$560,000.
- 3.41 (c) Consulting and training (US\$1,480,000). This category includes: (i) hiring consultants for project evaluation and follow-up (US\$50,000), management of protected areas (US\$60,000), agroforestry extension (US\$100,000) and forest protection (US\$210,000); (ii) costs of training technical staff, rural promoters and farmers (US\$270,000); and (iii) forestry training at the national level (US\$790,000).
- 3.42 (d) Studies (US\$2,130,000). Involves soil fertility studies, run-off and erosion plots, technological trials to be carried out by ICTA (US\$1,050,000), preparation of forestry management plans for 50,000 ha by private firms (US\$560,000) and pre-Hispanic archaeological studies (US\$520,000).

c. Concurrent costs (US\$2,160,000)

- 3.43 This category includes: (a) US\$1,650,000 for salaries and living allowances for incremental staff and travel costs for the participating public sector entities; and (b) US\$510,000 for operating

costs relating to fuel, rentals and office costs for the units in question.

d. Unallocated (US\$2,930,000)

- 3.44 (a) Contingencies (US\$1,150,000) calculated on the basis of 10% of the costs financed by the Bank and 5% for the local counterpart contribution; and (b) cost escalation (US\$1,780,000) based on inflation projections for foreign exchange and local currency.

e. Financial costs (US\$770,000)

Based on FSO financing conditions for a six-year disbursement period: (a) interest, 1% on balances; (b) credit fee of 0.5% on undisbursed balances; and an inspection and supervision fee of 1% of the total cost of the loan, payable in six annual installments.

3. Financing plan

- 3.45 Of the total estimated cost of the project equivalent to US\$17.9 million, it is proposed that the Inter-American Development Bank finance the equivalent of US\$14.4 million with resources from the Fund for Special Operations. The local counterpart to be provided by the Government of Guatemala will be equivalent to US\$3.5 million. Bank financing will account for 80%, and will cover all categories eligible for financing.

4. Proposed terms of financing

- 3.46 The terms and conditions for the financing requested from the IDB are: (i) amortization term: 40 years, including a 10-year grace period; (ii) disbursement period: six years; (iii) interest: 1% per annum during the grace period and 2% during the amortization period; (iv) credit fee: 0.5% on undisbursed balances; and (v) inspection and supervision: 1% on the total loan.

IV. PROJECT EXECUTION

A. Institutional plan of execution

1. Project coordination and supervision

- 4.1 The Ministry of Agriculture, Livestock and Food will be responsible for project supervision, administration and coordination. A government resolution will be issued creating an executing unit for the project on management and conservation of renewable natural resources in the upper Chixoy River valley (UNEPROCH), which will report directly to the Office of the Minister. The creation of UNEPROCH, appointment of its executive and technical directors, and the timetable for adding individual consultants and the rest of its staff are conditions precedent to the first disbursement. 5/
- 4.2 UNEPROCH will be responsible for: (i) overall coordination; (ii) technical and administrative supervision; (iii) signing agreements and contracts with participating public and private entities; (iv) procuring goods and services; (v) contracting personnel and consultants; and (vi) programming annual activities. 6/ The services of private firms will be hired for execution of some of these tasks, especially for staff contracting and management and procurement of consumer goods such as fuel and inputs; this would streamline the management and avoid the need to increase the staff of the Ministry.
- 4.3 In all cases, technical responsibility will be shouldered by specialized public sector entities reporting to the Ministry of Agriculture (UNEPROCH, DIGESA, DIGEBOS, ICTA) and the National Electrification Authority.
- 4.4 The participating entities are discussed in Chapter V. Activities have been assigned in keeping with the capacity, experience and legal and institutional authority of each of the entities. The following table summarizes the institutional plan of execution:

5/ See proposed resolution and Recommendation 4.

6/ See organizational chart in Annex IV-1. Annex IV-2 describes the functions, organization and personnel of UNEPROCH in detail.

Institutional Plan of Execution			
Functions and/or components	Technical responsibility	Subcontractor and executor	Direct costs 1/ (US\$000)
1. Coordination, supervision and administration	UNEPROCH	-	2,230
2. Research, follow-up and evaluation	UNEPROCH	ICTA	1,344
3. Soil conservation and agricultural promotion	DIGESA	DIGESA/Community	3,200
4. Forest protection and monitoring	DIGEBOS	DIGEBOS/Community	1,170
5. Extension and forestry demonstration 8/	DIGEBOS	NGO Consultants Community	1,320
6. Agroforestry extension	DIGEBOS	NGO/Community	1,700
7. Management of protected areas a. Study b. Management	CONAP UNEPROCH DIGEBOS	Consultants DIGEBOS -	280
8. Rehabilitation of gully erosion	UNEPROCH INDE	Community INDE	1,020
9. Hydrometeorological stations	INDE	-	620
10. Archaeological study	UNEPROCH	UNEPROCH	520

4.5 To formalize the relationship between UNEPROCH and the ministry's directorates general, a ministerial resolution will be issued regulating their participation and technical and administrative procedures. Interinstitutional cooperation agreements will be signed with the pendent entities, ICTA and INDE. Service contracts will be signed with the private companies selected through public competition. Issuance of the ministerial resolution and signature of the agreements are conditions precedent to the first disbursement. 9/

4.6 The specific agreements and arrangements concluded with each participating institution will include the following appendices:

1/ Does not include contingencies or escalation.

8/ DIGEBOS will be responsible for supervising the technical quality of the activities to be carried out by the NGOs and communities, and will approve the forest management plans to be prepared by local consulting firms with community participation (Annex IV-3).

9/ See proposed resolution.

(i) execution timetable and goals; (ii) estimated cost of the agreement; (iii) number and qualifications of personnel to be hired; (iv) mechanisms for executing the agreement; (v) guidelines for annual operating plans; and (vi) the necessary letters of delegation. Model agreements, prenegotiated with the participating institutions, are available in the PRA files.

B. Executors and beneficiaries

- 4.7 Thirty supervisors will work full time on the soil conservation and agricultural promotion component, and will organize and coordinate the activities of 480 promoters hired on a part-time basis. They will be small producers from the zone who have been previously selected and trained for these activities, and their responsibilities will include working a demonstration plot on the property they own or use.
- 4.8 This assistance is expected to reach 12,250 farmers in the selected microbasins, mostly native peoples who farm properties of under one ha growing single subsistence crops of corn and beans.
- 4.9 Since the beneficiaries will be incorporated in sequence, work will be done with 45% during the first three years, and with the remaining 55% in the last three years.
- 4.10 The agroforestry component is expected to reach 26 rural communities where 3,100 families work on subfamily properties for fewer than 5 ha. One hundred agroforestry promoters will work on motivation, extension and demonstration.
- 4.11 The intensive forest management subprogram will serve 24 communities (1,500 families) who own 5,000 ha of forest. The extensive management subprogram covers 45,000 ha on community, municipal and private land, and will benefit about 7,000 families. Forest awareness and fire control programs will be carried out on the 146,000 ha of forest in the other priority subbasins of Serchil, Blanco, Negro, Pacaranat, Chilil, Chicruz and Salamá, benefiting 320 communities.
- 4.12 The gully erosion rehabilitation component will benefit the participating communities by hiring 52,000 days' labor for construction of small works.

C. Technical execution of the project components 10/

1. Soil conservation and agricultural promotion component

- 4.13 The Directorate General of Agricultural Services (DIGESA) will be responsible for executing the soil conservation and agricultural promotion component.
- 4.14 Six operational headquarters will be set up to execute this component, one in each municipality where the priority subbasins are located: (1) Santa Cruz del Quiché; (2) Cunén; (3) Aguacatán; (4) Malacatancito; (5) Momostenango; and (6) Santa María Chiquimula.
- 4.15 One agricultural extension agent specializing in soil conservation will be assigned to each operational headquarters, and will be responsible for executing this component in his respective area of influence. The full-time supervisors and the promoters will report to the extension agent.
- 4.16 The promoters will work half time for the project, each assisting 25 farmers, and will farm their own plots where they will use agricultural practices and soil conservation techniques as examples to be emulated by the other farmers.
- 4.17 The extension and soil conservation agents at the operational headquarters will be supported by an agricultural engineer specializing in production systems, and an agricultural engineer specializing in soil management and conservation.
- 4.18 The soil conservation and agricultural promotion program is based on a system of promotion, training and research. No agricultural credit component is included because the subsistence farmers at whom the program is aimed do not have access to institutional credit. If the soil conservation is to be accepted, it is crucial to demonstrate that farm productivity can be increased by adopting sustainable and conservationist agricultural practices.
- 4.19 In keeping with the responses to the opinion survey and considering the Bank's operating methods, it was decided to opt for the promotion and training system described above, supplemented with certain minimum inputs for practical implementation. The inputs chiefly include providing vegetative material free of cost to build living barriers, which will essentially include planting grasses on the windrows, edges of terraces, absorption embankments and other mechanical works to retain soil and dissipate the kinetic energy of run-off. In addition, construction tools such as shovels, pickaxes and hoes will be provided for building terraces, embankments and windrows.

10/ The table of individual consultants appears at Annex IV-4.

- 4.20 The project will also be provided with working inputs for demonstration activities, training and minor services involving fumigation, seeds, vaccines and other veterinary products.
- 4.21 The experience gained under the National Agricultural Extension System Training Program (PROCASNEA) of the Ministry of Agriculture will be drawn on to train project implementers and supervisors. A total of 32 training topics for each of the following areas have been planned: farm-forestry-grazing systems, production, waste, animal management and fodder production. A total of 160 courses will be offered directly in the countryside, with about 15 participants per course. Each course will be full time lasting from one to three days, and will include an evaluation on leadership, comprehension, participation and responsibility.

2. Forestry component

- 4.22 DIGEBOS will be the coexecutor and technical supervisor of the project forestry component. As such it will: (i) execute the forest production and monitoring subprogram with the communities; (ii) supervise the technical quality of the extension and demonstration subprograms for forest management and agroforestry production systems, reforestation and promotion of improved firewood stoves; (iii) approve the forest management plans; and (iv) participate in the production of trees for reforestation.
- 4.23 The subprograms for forest management and agroforestry, reforestation and improved stoves will be executed directly by the communities based on promotion, extension and demonstration activities by nongovernmental organizations to be contracted by the executing unit with approval from DIGEBOS.
- 4.24 During the first year of execution, specialized firms will be contracted, with DIGEBOS's approval, to prepare the forest management plans and to take aerial photographs. The communities will participate actively in preparing the forest management plans to reflect the traditions and interests of the beneficiaries, thereby ensuring that they will be executed. The NGOs responsible for motivation for forest management and extension work will play an important role in promoting community participation.
- 4.25 Investments in improved pastures under the soil conservation and agricultural promotion component will be made in coordination with the agroforestry activities designed to improve forest and woodland grazing production techniques and with forest management activities aimed at reducing overgrazing on lands that are best used for forests and allowing natural regeneration.

a. Forest extension and demonstration

- 4.26 Forest management extension and demonstration activities will be carried out with organized groups that will gradually join the

program. The project will finance intensive (5,000 ha) and extensive (45,000 ha) forest management plans, which will lay the technical groundwork for its protection and sustainable use. During the first 18 months of execution, the promoters will receive training in the management and sustainable use of forests in the high plateau, and in forest extension activities.

- 4.27 Forest management activities will be carried out with technical assistance from 22 forestry promoters and the beneficiary communities. NGOs with experience in community and forest development programs will be responsible for extension and promotion.
- 4.28 The beneficiary communities will also receive technical assistance and training, financing for the forest management plans, and tools and inputs for establishing demonstration plots.
- 4.29 This subprogram includes the establishment of 192 demonstration plots that will cover 132 ha and be used for resin tapping techniques, as sample stands for seed collection, permanent plots for thinning and production, plots in which offshoots are removed for natural forest regeneration, controlled burning, woodland grazing, reforestation for enrichment, and plots for trials with native species.

b. Agroforestry production systems

- 4.30 Agroforestry activities will be carried out in 26 communities in areas not involved in the soil conservation and agricultural promotion component. The aim is to promote eight specific systems for sustainable production that will combine crops and grazing with trees.
- 4.31 The promotion, extension and demonstration methods will be similar to those used in the forest management subprograms.
- 4.32 Agroforestry activities will be coordinated by one professional and four supervisors engaged by the NGO responsible for this component. Execution will be carried out by 100 agroforestry promoters and the beneficiary farmers.
- 4.33 The agroforestry promoters will be the first to apply the proposed agroforestry systems on their farms as a demonstration strategy.
- 4.34 A training program on agroforestry systems, the establishment and maintenance of nurseries, and rural extension and community organization techniques has been designed for the agroforestry promoters for the purpose of transferring agroforestry practices and systems to the direct project beneficiaries.
- 4.35 Provision has been made for the creation of nurseries for forest and fruit trees on the community level, to be established and

managed by the community itself with technical and financial assistance from the project.

- 4.36 The promoters will offer technical assistance and the project will contribute tools for tree planting. The project will finance non-local materials (metal parts) for the construction of 6,000 improved stoves.

c. Forest protection and monitoring

- 4.37 Prevention of fires, diseases and pests will be encouraged chiefly through educational programs conducted by DIGEBOS with the assistance of forestry and agroforestry promoters. The communities, with technical assistance from the project, will guard against the spread of fires and pests through controlled burning, the construction of fire breaks, and the removal of diseased trees that could infect the forest.
- 4.38 Eight observation towers to detect forest fires over 146,000 ha will be built in the subbasins of Chixoy, Serchil, Pacaranat, Chilil, Chicruz and Salamá, equipped with radios, maps, binoculars and fire fighting tools. In the period when the threat of forest fires is greatest (November through April), 30 surveillance and fire-fighting brigades will operate, each composed of a rural leader to organize the communities, and about six volunteers.
- 4.39 DIGEBOS will be responsible for controlling and combating forest fires, controlling pests and diseases, and preventing illegal logging. The project will finance personnel for forest protection and surveillance in selected subbasins, and will support forest monitoring in other zones in the basin by funding three technicians and vehicles.

d. Reforestation and improved stoves

- 4.40 With technical assistance from the supervisors and promoters of the forest management and agroforestry subprogram, 2.1 million seedlings of native species will be distributed and planted in the project zone. In the first years of the project, most of the trees will be produced in existing DIGEBOS nurseries, but the contribution made by community nurseries will gradually increase with technical assistance from the agroforestry and forestry promoters until it accounts for 50% of total production. This has been reflected in the budgets for the forest production and monitoring, forest management, and agroforestry subprograms. The farmers who benefit from the investments in agroforestry production will receive technical assistance, as well as inputs, and tools financed by the project to establish demonstration plots and make initial investments in agroforestry production systems.

- 4.41 Improved stoves will be distributed to the beneficiaries and their installation will be supervised by personnel from the NGOs to be hired for the forest management and agroforestry subprogram.

e. Management of protected areas

- 4.42 Management plans for the zone adjacent to the Pueblo Viejo reservoir and the Los Cuchumatanes zone will be developed during the second half of the project by individual consultants. An international consultant specializing in management of protected areas will be contracted for one month, in addition to 27 person/months of national consultants specializing in natural resource planning (six months), fish farming (three months), ecology (six months), forest management (six months), natural resource economy (three months) and sociology (three months).
- 4.43 Areas will be marked off for inventories of renewable natural resources, and field surveys will be conducted on land tenancy and identification of owners, with the cooperation of forest wardens in the Pueblo Viejo area and forest extension agents in Los Cuchumatanes.
- 4.44 The management categories and uses for the different areas will be established, and zoning will be proposed, dividing the territory into areas that will be fully protected and areas for public use, and a series of management activities will be designed. The types of use will be determined in each case, as will the administrative measures and investments required. The management plans will be submitted to the National Council for Protected Areas (CONAP) for approval.
- 4.45 Immediate control over the area that drains directly into the Pueblo Viejo reservoir will be carried out by an administrator and five wardens hired by the project. Their activities will involve extension and environmental awareness, fire prevention and control of overgrazing. DIGEBOS will participate in the activities of this subcomponent.

3. Gully erosion rehabilitation component

- 4.46 The technical unit of UNEPROCH will be responsible for the final selection of the eroded areas to be rehabilitated (within the selected microbasins), which will be ranked in order of priority based on potential soil loss, sediment delivery coefficient, the amount of plant cover in the zone of influence, accessibility of the site, potential damage, and enhancement of other protective activities.
- 4.47 The work will be carried out using local labor only, as an activity to benefit the communities. The works will be built over five years, covering about 200 ha a year.

4. Research, evaluation, follow-up and studies component

- 4.48 Each of the project components will have a monitoring and follow-up system based on periodic reports for the different levels of execution, assistance and supervision. This information will be submitted to the Technical Evaluation Unit, which will be responsible for processing and analyzing it.
- 4.49 Three consultants will be hired for these activities, specializing in: (i) designing and installing data systems (60 days); (ii) designing and conducting studies and special samples (60 days); and (iii) formulating a simulation model for the watershed (120 days).
- 4.50 INDE will be responsible for constructing and operating the weather and hydrographical stations. It will perform the necessary sedimentation and water gauging, and process the basic information from existing stations, which it will share with UNEPROCH and the other coexecuting institutions.
- 4.51 UNEPROCH will work in close cooperation with ICTA and will use the information obtained in the technology validation subcomponent, which will include: (i) physical and chemical classification of soil, fertility studies, and correlation between erosion and fertility loss; (ii) adaptation and trials of agricultural technology for the main crop associations - corn, beans, wheat, potatoes grown on steep ground - and the introduction of new crops as part of the production systems; trials of species, mainly grasses, that can be used as living barriers in soil conservation systems, and which will also produce forage suitable for animal feed; adaptation and trials of livestock technology, stressing the management of sheep and goats; and (iii) research on the effectiveness of soil conservation works and production systems in reducing erosion, increasing the organic content of the soil, and boosting soil fertility.
- 4.52 It is necessary to strengthen the institutional capacity of the public, academic and nongovernmental sectors in Guatemala in the areas of nonrenewable natural resource and integrated watershed management. This activity will include short-term training in forestry and agroforestry management practices for a small group of professionals, technicians and farmers.
- 4.53 For this purpose, UNEPROCH will contract the services of three international consultants for a total of 40 person/months, specializing in areas that include planning and watershed management, evaluation and monitoring of management programs and systems, and institutional development.
- 4.54 Training includes funding for studies abroad and courses in the country. The foreign study will include work for masters' degrees by eight professionals, 30 technicians and four rural leaders. Courses in Guatemala will be provided for 150 technicians and 40 female rural leaders.

- 4.55 The preliminary inventory of archaeological sites in the watershed, conducted as part of the feasibility study, showed that there are a large number of remains reflecting pre-Hispanic life in the area; 256 sites were inventoried, most of which have not been adequately studied or demarcated. There was evidence of inappropriate use of stones from unprotected archaeological sites by the local population. Detailed field studies are required to minimize the risk of damage to archaeological sites caused by any of the project activities, and a specific plan must be drawn up to protect the pre-Hispanic heritage in the watershed.
- 4.56 For this purpose, UNEPROCH will contract the services of one international consultant, seven national consultants, seven archaeological assistants and one cartographer. The consulting services will include archaeology, rock studies, demography, restoration and linguistics for a total of 494 person/months.

5. Recurrent costs

- 4.57 The proposed project will last for six years. It will be necessary to keep a minimum staff to continue activities in the zone after that time. UNEPROCH will maintain the planning, research, follow-up and evaluation group which will continue evaluating and studying the watershed. The annual investment requirements are estimated to be the equivalent of US\$38,000 at constant prices.
- 4.58 The soil conservation and agricultural promotion component will keep a central unit in the zone run by an agricultural engineer, and six operating units each run by an extension agent. Each agent will have four promoters working full time. The annual investment requirements will be the equivalent of US\$115,000 at constant prices.
- 4.59 The forestry component will come under DIGEBOS and will have the following resources for the different subprograms. The forest protection subprogram will be run by a forestry engineer, four forestry technicians and four radio operators. The agroforestry subprogram will be headed by one engineer, with two forestry technicians and 20 promoters. The forest management subprogram will have one forestry engineer, two forestry technicians and ten promoters. The annual investment requirements will be the equivalent of US\$146,000 at constant prices.
- 4.60 One administrator and three wardens will be required to monitor the protected area adjacent to the reservoir. The recurrent annual costs will be the equivalent of US\$20,000.
- 4.61 It is estimated that nine professionals, 21 technicians and 54 promoters will still be in the project area at the end of the execution period. The ordinary net costs will be in the order of US\$319,000, which will be absorbed by the respective institutions.

D. Maintenance of plantations and works, and continuity of the project

- 4.62 The activities to be carried out under each of the project components by the participating institutions are either part of their regular mandates or have been newly legislated. The personnel and resources required to continue and maintain activities in the project areas will be specified under each component, and constitute a contractual commitment to Bank on the part of the borrower. 11/
- 4.63 It will be necessary to establish additional stages for comprehensive management and protection of the entire watershed, and to determine sources of financing. UNEPROCH will contract the consultants mentioned in paragraph 4.53 to prepare continuity studies for the institutional structure and execution of project activities.
- 4.64 Within 36 months of the date of the prospective loan contract, the borrower, through the MAGA, will present to the Bank's satisfaction an institutional plan to guarantee the continuity of project activities, and after 48 months, it will submit evidence that the necessary steps have been taken to implement the proposed plan. 12/
- 4.65 The borrower will present to the Bank each year for the ten years following the disbursement period: (i) a report on measures and actions by the beneficiaries to comply with the management and protection requirements met with project funds; and (ii) a report on staff and financial resources allocated for continuation of the project activities in the following year. 12/

E. Annual execution goals

- 4.66 Annual goals for each component have been based on the project execution schedule.

11/ See Recommendation 2.

12/ See Recommendation 3.

SUMMARY OF INCREMENTAL PROJECT GOALS								
Activity	Unit	1	2	3	4	5	6	Total
Soil conservation	ha	700	1,050	1,050	1,400	1,400	1,400	7,000
Pastures	ha	304	304	302	240	240	230	1,620
Intensive forest management plans	ha	200	800	1,000	1,000	1,000	1,000	5,000
Extensive forest management plans	ha	1,000	8,000	9,000	9,000	9,500	8,500	45,000
Agroforestry systems	ha	50	100	200	300	400	500	1,550
Forest protection	ha	3,000	25,000	60,000	40,000	18,000	-	146,000
Gully control	ha	200	200	200	200	200	-	1,000
Firewood stoves	unit	500	1,000	1,200	1,300	1,000	1,000	6,000

F. Investment schedule and execution period

- 4.67 The following disbursement schedule by source of financing has been based on the annual execution goals:

Disbursement schedule (in the equivalent of US\$ thousands)							
Source	Year						Total
	1	2	3	4	5	6	
IDB	3,471	2,633	2,448	1,937	2,100	1,811	14,400
LOCAL	525	603	601	598	597	576	3,500
TOTAL	3,996	3,236	3,049	2,535	2,697	2,387	17,900
%	22.3	18.1	17.0	14.2	15.1	13.3	100.0

- 4.68 Most of the equipment and vehicles required for field work will be procured in the first year.
- 4.69 The project execution method differs from the normal pattern for other Bank investment projects in some very important ways. In this project, the executors and the beneficiaries, in other words the rural population, are essentially the same. They must first be motivated and trained in a process of "learning by doing" to execute the soil conservation works, the programs for agricultural and agroforestry diversification, and the forest management plans. In addition, the farmers must be allowed a period to become familiar

with the techniques so as to guarantee that they will continue applying the practices efficiently. These technicians will need to use nontraditional methods of communication, given the sociocultural characteristics of the campesinos, indigenous for the most part, who speak over 10 dialects and are usually averse to innovations from outside. Success of the program hinges on this process of motivation, training, action, and permanent use, which cannot be completed efficiently in the usual four-year execution period.

- 4.70 Prior to beginning project field activities, the UNEPROCH promotion unit should make contact with organizations and residents in the zone, to encourage the population to participate, and begin the process of selecting promoters.
- 4.71 Six years are considered therefore necessary to allow for the training of promoters and rural paratechnicians, and to organize, train and heighten the awareness of the beneficiaries. It should also be noted that the execution schedule considers the possibility of drawing on past experience to improve execution (feedback process).

G. Advance funds

- 4.72 Based on the disbursement schedule and the way in which the project will be executed, it is recommended that up to US\$1,440,000, equivalent to 10% of the total loan, be advanced. The project executing unit will be expected to channel these resources for use within 120 days following their receipt, and this use must be justified within the following 180 days.

H. Procurement procedure

- 4.73 All goods and services costing more than US\$200,000 that are totally or partially financed with project resources will be let for international public tenders in keeping with Bank procedures as described in Annex IV-9. For amounts under US\$200,000, price competition will be used. Bank procedures will be followed in contracting individual consultants and/or firms, as described in Annex B. However, ICTA will be contracted directly to conduct the studies described in paragraph 4.52, at a cost of US\$1,200,000 equivalent.
- 4.74 ICTA is a decentralized, nonprofit institution in public law, linked to MAGA, and is responsible for the generation and promotion of agricultural technology. The Bank has assisted in its institutional strengthening through loan 473/SF-GU. It possesses the best installed capacity in laboratories, human resources, experience in the high plateau and other technical requirements for providing the services needed for the project in its area of specialization. These activities are not expected to interest private firms, since they would only be covering a fraction of the real cost of the studies and surveys.

I. Inspection and supervision

- 4.75 Inspection and supervision during program execution will be carried out by the Bank field office in Guatemala. In keeping with the new Bank procedures, the project team will be responsible for technical control during execution.

J. External auditing

- 4.76 The project's financial statements will be submitted to the IDB, audited by an independent firm of public accountants acceptable to the Bank. The project's financial statements will be submitted to the Bank during project execution beginning in the first financial year in which costs chargeable to the project are incurred. The financial statements in question should contain a breakdown of costs and disbursements by each executing institution.

K. Follow up and ex post evaluation

- 4.77 UNEPROCH, through its technical department, and ICTA shall be responsible for designing and implementing the follow-up system and preparing the reports.
- 4.78 It is recommended that the unit submit the following reports to the Bank's satisfaction:
- a. The ex ante situation at the start of the project. It will include a detailed description of the methodology to be used in comparing annual data and in estimating the effects of the different project components. This report will be submitted within 12 months of the signing of the contract.
 - b. Annual updating during project execution of socioeconomic information on the beneficiaries, and of progress in the soil conservation and agricultural promotion, forestry, gully erosion rehabilitation and protected area management components.
 - c. Annual data on production, productivity, cost and maintenance of the activities mentioned in b.
 - d. Specific indicators showing progress made in attaining the objectives of the project, including sustainability.
- 4.79 It is recommended that the unit responsible for evaluation conduct intermediate reviews of the project in conjunction with the Bank between 30 and 52 months from the date on which the loan contract becomes effective. ^{13/} It will involve a review of the information on the activities described in 4.78 for the first two and

^{13/} See Recommendation 7.

four years of execution, respectively, including an assessment of the hypotheses used in the economic evaluation, based on the information in question. In carrying out this task, the executing unit will be supported by the consultants engaged for planning, watershed management, and evaluation and follow-up and institutional development.

V. THE BORROWER AND THE EXECUTING AGENCIES

A. The borrower

- 5.1 The borrower will be the Republic of Guatemala, which will provide the local counterpart resources required for total project financing out of the government's investment budget.

B. The executing agencies

- 5.2 The organizational structure and financial capacity of the executing agency, the Ministry of Agriculture, Livestock and Food, and the Directorates General of Agricultural Services (DIGESA) and Forests and Wildlife (DIGEBOS) are analyzed below.

1. Ministry of Agriculture, Livestock and Food

a. Background

- 5.3 Created under Decrees 102-70 and 51-81, the ministry is the senior authority in the public agricultural and food sectors, and its principal functions are to formulate and follow up on government policy related to agricultural and food activities.

b. Organizational structure

- 5.4 The organizational structure of the sector is composed of management, advisory and executing bodies, centralized and decentralized agencies, and support units and offices.
- 5.5 The centralized agencies include the Directorate General of Agricultural Services (DIGESA) which is responsible for technical assistance programs and transfers of agricultural technology particularly to small and medium producers, and for government plant health controls. The Directorate General of Livestock Services (DIGESEPE) is responsible for promoting livestock development and maintaining government controls over the quality of animal products, and the Directorate General of Forests and Wildlife (DIGEBOS) is responsible for forest development planning.
- 5.6 The decentralized institutions linked to the MAGA are: the Agricultural Science and Technology Institute (ICTA), which is responsible for generating and promoting the application of agricultural science and technology; the National Agricultural Development Bank (BANDESA), which is an agricultural development finance institution, particularly for small- and medium-sized producers who are not eligible for loans from private banks; the National Agricultural Marketing Authority (INDECA), which is responsible for promoting farm marketing services; the National Authority for Agrarian Change (INTA), whose purpose is to ensure

the rational use of land and administer programs for agrarian change; and the Asunción Mita Dairy Products Company (PROLAC).

- 5.7 The support units include: the Sectoral Agricultural Planning and Food Unit (USPADA), which provides the ministry with technical advice on formulating and evaluating policies in cooperation with the Sectoral Programming Council (COPROSEC); the Technical Directorate of Legal Affairs; the General Secretariat; the Emergency Programs Office; the Training Program for the National Agricultural Extension System; the National Wheat Growers Association; and the National Coffee Association.
- 5.8 The support offices include the National Reserves Monitoring Office (OCREN) which is responsible for applying legislation to regulate reserve areas on the shores of lakes, rivers and coasts, and the Consultative and Administrative Coordinating Office (COCASPA), which is responsible for coordinating and developing sectoral administration and conducting pre-audits of spending.
- 5.9 The ministry will play a very important role in executing the forestry and soil conservation and agricultural promotion components, through its centralized entities, DIGEBOS and DIGESA. These entities are supposed to provide support for small farm and forest producers but their impact on rural productivity and the conservation of natural resources has been slight, owing to the shortage of human, physical and financial resources for their work programs. Therefore, this project, in addition to providing financial resources to acquire equipment, inputs and personnel to execute activities, also stresses participation by community members as project executing agents, which will generate an effective transfer of technology and conservationist ideas, establishing continuity of activities and a gradual reduction in government participation.

c. Participating agencies of the Ministry of Agriculture, Livestock and Food

(i) Directorate General of Agricultural Services (DIGESA)

- 5.10 The Directorate General of Agricultural Services, which will bear the technical responsibility for executing the soil conservation and agricultural promotion component of the project, was created under the legal and institutional framework of Decree 102-70.
- 5.11 Article 20 of Ministry of Agriculture Resolution 11-71, which approves the regulations governing the ministry, defines the Directorate General of Agricultural Services as the "agency of the Ministry of Agriculture responsible for programming, organizing, executing, evaluating and monitoring programs for agricultural production and services, and for keeping farm producers informed

about technology and the government's general agricultural development policy".

- 5.12 DIGESA has a directorate general, three support units, a national technical department subdivided into three specific technical departments, and eight regional technical departments.
- 5.13 DIGESA is managed by a director and an assistant director who are advised by a Consultative Technical Council. The Directorate General is supported by units responsible for administration, project coordination, agreements and programming and economic studies. The specific technical departments include plant production, plant health, irrigation and drainage.
- 5.14 The regional technical departments are grouped into subregions, which in turn are subdivided into supervisory districts and again into agricultural extension agencies, which deal directly with the farmers. Two of the eight regional departments will participate in project execution.
- 5.15 In 1990 DIGESA had a permanent staff of 3,449 employees and 3,782 agricultural representatives who are hired in the communities for a maximum of two years. The permanent staff in the central offices, including the three technical departments, numbers 565 (16%), while the remainder works in the eight regional offices. The following table shows the distribution of personnel and their academic qualifications.

	Dir. General	Plant Prod. Dept.	Irr. and Drain. Dept.	Plant Health Dept.	Regional Depts.	Total
University	28	10	40	14	95	187
University technician	3	—	2	4	49	58
Admin. & Gen. Serv. level	210	34	145	75	2,734	3,198
Total	241	44	187	93	2,878	3,243
%	7.0	1.3	5.4	2.7	83.6	100.0

- 5.16 Two important conclusions can be drawn from a qualitative analysis of DIGESA's staff. In the first place, the directorate has staff that is qualified to carry out its technical activities, and in the second, given the nature of the functions for which it is responsible, budget constraints decrease its operating flexibility, and considerably reduce the productivity of its human resources.

(ii) Directorate General of Forests and Wildlife
(DIGEBOS)

- 5.17 The Directorate General of Forests and Wildlife will bear technical responsibility for forest protection, extension and forest demonstration, and the agroforestry extension component. It is a centralized agency of the ministry, created under Government Resolution 393-88. Its goals are to formulate and implement national policy to develop and regulate forest and wildlife resources, coordinating activities for the management and conservation of these resources with other agencies and institutions.
- 5.18 DIGEBOS is the successor of the National Forestry Institute (INAFOR), created by Congress under Decree 51-74. It is headed by a director general, and its organizational chart is given in Annex V-4.
- 5.19 It has three technical departments: forest management, wild life and protected areas, and renewable natural resources; two support sections - administration and planning, and programming; and a technical office that coordinates regional implementation. DIGEBOS is composed of its central offices, eight regional offices and 31 subregional offices. The new management is currently restructuring the directorate to increase its presence in forestry activities and the provision of technical services.
- 5.20 DIGEBOS has a total staff of 1,913, with 238 located at headquarters and 1,675 in the field.
- 5.21 Qualitative and quantitative information on the directorate is presented below:

DIGEBOS STAFF BY LEVEL OF EDUCATION

Classification	Central	Regional	Total
1. Postgraduate	3	1	4
2. University	108	29	137
3. Secondary	94	129	233
4. Primary-Basic	<u>33</u>	<u>1,516</u>	<u>1,549</u>
TOTAL	238	1,675	1,913

- 5.22 The importance of this directorate has been waning owing to the absence of a sectoral policy that defines the government's role in forest management. Its budgets have shrunk significantly and this has had a negative impact on the services it provides and on the quality of its personnel. Given this situation, support from non-governmental organizations such as CARE, which has experience in

the sector, and community participation in the field work are needed.

d. Budget of the Ministry of Agriculture, Livestock and Food

5.23 The Ministry of Agriculture's budget has tended to shrink in recent years. On the average, it receives about 5% of the total central government budget. In fiscal 1991, its allocations accounted for 4.3% of the total operating budget, and 8.95% of the investment budget.

5.24 The following table shows the budget performance of the Ministry of Agriculture over the last five years, broken down into operating and investment costs.

BUDGET EXECUTION OF THE MINISTRY OF AGRICULTURE, LIVESTOCK AND FOOD										
(in millions of US\$ at 1991 prices)										
	ALLOCA TED				EXECUTED					
	Operating	Investment	Total		Operating	%	Investment	%	Total	%
1991 ^{a/}	24	66.6	90.6		-	-	-	-	-	-
1990	21.4	63.6	85.0		19.1	89.2	50.5	79.4	69.6	81.9
1989	30.6	55.0	85.6		25.7	84.0	39.5	71.8	65.2	76.2
1988	25.5	35.8	61.3		33.4	131.0	17.9	50.0	51.3	83.7
1987	24.4	21.7	46.1		25.5	104.5	11.9	54.8	37.4	81.1

^{a/} Approved budget.

SOURCE: State Budget, Government Accounting Office.

5.25 Its operating budget has been almost completely executed over the period, while execution of its investment budget has been lower, ranging from 50% to 79%.

5.26 The local counterpart deriving from external loan agreements is not very significant in its investment budget, accounting as it does for less than 0.4% of the total central government budget and less than 9% of the ministry's budget. This project represents an annual investment of approximately US\$2,750,000, which is the equivalent of 12.7% of the ministry's investment budget in 1990.

- 5.27 The budgets of the Directorates General that will participate in project execution are given below.

<u>BUDGET EXECUTION</u>						
(in thousands of US\$ at 1990 prices)						
	<u>1988</u>	<u>%</u>	<u>1989</u>	<u>%</u>	<u>1990</u>	<u>%</u>
<u>DIGESA</u>						
Operating	1,714.8	42.1	4,376.2	79.5	4,207.8	78.7
Investment	<u>2,357.7</u>	<u>57.9</u>	<u>1,129.7</u>	<u>20.5</u>	<u>1,136.2</u>	<u>21.3</u>
Total	4,072.5	100.0	5,505.9	100.0	5,344.0	100.0
<u>DIGEBOS</u>						
Operating	1,055.7	68.1	886.2	46.1	1,097.9	42.2
Investment	<u>494.7</u>	<u>31.9</u>	<u>1,035.4</u>	<u>53.9</u>	<u>1,500.5</u>	<u>57.8</u>
Total	1,550.4	100.0	1,921.6	100.0	2,598.4	100.0

- 5.28 DIGESA's budget has remained constant in real terms, but there has been a significant increase in its operating costs and a reduction in its investments.
- 5.29 The cost structure shows that operating costs are very high in comparison to investments, although the latter have fallen significantly over the period in question. In 1988, operating costs accounted for 42.1%, while investments accounted for 57.9% of total spending. In 1989, the figures were 79.5% for operations and 20.5% for investments, and 1990 was similar to the preceding year.
- 5.30 It should be pointed out that the operating budget is not spent on administration, but rather the bulk goes for agricultural development activities such as technical assistance for small- and medium-scale farmers, promotion and community organization, processing and distribution of improved seeds, preparation of nurseries, and administration of irrigation units. The programs even include transfers of technology under PROGETAPS (Project to Generate and Transfer Agricultural Technology and Seed Production) financed with IDB and IFAD resources. The operating budget also includes items for the crop diversification, mini-irrigation and soil conservation, components of the projects for agricultural development of the high plateau and diversification systems for small high-plateau farmers, partially financed by USAID.
- 5.31 As for investments, most of the resources are spent on irrigation projects, rice milling, and the preparation of studies for new projects.
- 5.32 DIGEBOS's income comes mainly from central government transfers, which is similar to the situation that prevailed in the time of INAFOR. Of its total budgets from 1986 to 1990, 88% came from the

central government. Its own income, generated by the sale of forest nursery products, is insignificant.

- 5.33 In 1990, DIGEBOS' budget execution rose by 35% over 1989, from US\$1,921,600 to US\$2,598,400. Most of its resources go for investments, particularly in reforestation programs, production of trees in nurseries, and protection of water sources. However, its budget has been cut significantly since 1987 when it was US\$5.7 million. In 1990, DIGEBOS' budget was just 3.6% of the ministry's total budget, which points to the scant attention paid to this activity in the past.
- 5.34 The recurring costs of this project for DIGESA are estimated at US\$115,000 a year for continuing with soil conservation activities, and for DIGEBOS they are US\$146,000 in the forestry sector. These amounts represent 2.7% and 13.3% of their respective operating budgets.

2. Other community and private organizations

- 5.35 Nongovernmental organizations have a long tradition in Guatemala. Their activities were consolidated as a result of the 1976 earthquake, and they worked very efficiently on reconstruction, covering an extensive gamut of interests and sectors. Several organizations that are working with dispersed rural communities and more densely populated areas have been identified in the project zone.
- 5.36 The organized groups include about 375 "pro-improvement committees" in the watershed. They are legally recognized and are authorized to handle both government and donor funds. There are approximately 24 cooperatives with 4,320 members in the zone, mostly savings and loan and agricultural cooperatives. The Local Development Committees were created when the new Constitution was promulgated in 1985, and their patterns of action are similar to those of the pro-improvement committees.

VI. PROGRAM JUSTIFICATION, FEASIBILITY AND RISKS

A. Technical feasibility

- 6.1 The participating institutions are capable of executing the project components and activities, since Guatemala has sufficient experience with rural extension programs, soil conservation, reforestation, forest management and protection, and construction of water gauging and weather stations. With support from NGOs and the INDE, DIGEBOS has been developing pilot reforestation and agro-forestry projects with communities in the high plateau, and DIGESA is conducting a technological assistance program (PROGETTAPS), using strategies similar to those required for the project.
- 6.2 The technical reasons that make the soil conservation and agricultural promotion component feasible are: (1) the geomorphological analysis and results of the universal soil loss equation, which were used to determine which microbasins have high erosion rates; and (2) the agricultural and socioeconomic analyses, which were used to determine the areas in which the project would act.
- 6.3 The project study has shown that erosion in the watershed is caused by inappropriate farming practices, and that it can be reduced through the use of adequate technologies. Technological packages for farming practices and management systems are available, which have proven to be efficient in other regions and which can be tested and adapted to project conditions.
- 6.4 It can therefore be concluded that: (1) mechanical soil conservation works are required to reduce the kinetic energy of water that causes erosion, which can be achieved through works that modify the natural slope of the land (terraces) and works to reduce the length of the trajectory of run-off water (contour furrows, windrows, embankments, living barriers of permanent and semipermanent plants, and dead barriers); (2) farming practices must be introduced to reduce erosion and avoid the associated phenomenon of soil degradation, i.e., drop in fertility owing to the loss of the arable layer, removal of nutrients, compacting, and reductions in porosity, critical depths for roots, and moisture retention capacity.
- 6.5 Guatemala has some experience with this type of approach to farming steep land. USAID and other bilateral agencies have financed small soil and water conservation projects and technical assistance for farming and forestry along similar lines. The scope of these projects, however, is limited and no organization capable of executing them systematically with a view to repeating them in other parts of the country has been consolidated on an institutional basis.
- 6.6 Moreover, there are very few cases in which the results of programs of this kind have been evaluated. One exception is the evaluation

made by CARE of the agricultural component in its agroforestry project, which points conclusively to the technical and economic advisability of constructing soil conservation works in combination with other farming practices. In that case, substantial increases in production were obtained for corn, beans and broadbeans, three crops which are important in the project area, and some producers were able to obtain internal rates of return of 50% on their investments over four years.

- 6.7 The objectives of the forestry component are consistent with the country's efforts in regard to forest and renewable natural resources management. The country has experience in managing forests for production and protection purposes, and with agroforestry energy and multiple-use pilot programs, which have attracted the support and interest of farmers. Forest management plans have been prepared in Guatemala for the private sector, and to a lesser extent, for forests belonging to indigenous communities. The project provides for contracting one or more NGOs that have worked with communities in the high plateau on forest management activities.
- 6.8 The techniques to be used in forest management and agroforestry systems have been tested in other national and international programs, such as MADELEÑA, which received technical assistance from CATIE.
- 6.9 The techniques to be applied in controlling logging, pests and fires have already been implemented in Honduras, Nicaragua and other countries with favorable results.
- 6.10 Extension, monitoring and surveillance programs in zones that resemble the protected natural area of Los Cuchumatanes have helped reduce deforestation rates, control grazing and prevent fires, which have permitted recovery of plant cover and soil.
- 6.11 Programs to rehabilitate degraded areas in the zone have been carried out since 1984, and experience can be drawn upon for designing and building the small scale works required. Priority has been assigned to building them in areas where appropriate materials exist, and the best designs for stabilizing slopes and stopping solid matter from being carried away have been identified to facilitate the natural regeneration of plant cover.
- 6.12 INDE, which has considerable experience in designing and building weather and water gauging stations, will continue with the maintenance and collection of routine data that it performs in the area.
- 6.13 The executing unit (UNEPROCH) will be directly responsible for monitoring and follow-up, having been created expressly for this purpose. ICTA, which is a specialized public agricultural research

body with adequate experience in this field, will assist in validating the technologies.

- 6.14 The project has been scaled to meet with immediate needs for the management of renewable natural resources in the Chixoy River valley. With the planned promotion among farmers and the community, the creation of an executing unit that is properly staffed, participation by specialized entities from the sector, and the cooperation of NGOs that have worked in the valley, it can be concluded that the institutions in question will be capable of carrying out the project and complying with its objectives and goals, provided they follow the programs and strategies that have been planned.

B. Legal, institutional and financial feasibility

1. Legal feasibility

- 6.15 Congressional Decree 68-86 promulgated the Environmental Protection and Improvement act, one of whose goals is the rational use of renewable natural resources. CONAMA is responsible for enforcing this act, and its sphere of action covers all government ministries. CONAMA will sit on the Project Technical Advisory Committee.
- 6.16 Government Resolution 195-89 created the National Watershed Management Commission (CONACUEM), which is responsible for advising on and coordinating activities related to watershed management. CONACUEM also sits on the Project Technical Advisory Committee.

2. Institutional viability

- 6.17 Under current legislation, the Ministry of Agriculture is responsible for monitoring, developing and protecting forests, wildlife, plants and soil resources. Therefore, execution of this project is the Ministry's institutional responsibility.
- 6.18 MAGA has been executing some projects with Bank financing in recent years, particularly the technology generation and transfer program (PROGETTAPS) partially financed with loan 473/OC-GU, in which the entities involved in the present project also participate. The earlier project suffered from execution problems under the ministry's last management, particularly owing to the lack of interinstitutional coordination. However, its new management has taken corrective measures and reactivated project execution.
- 6.19 The different participating public entities described in Chapter V have the necessary experience to execute their respective components and have generally carried out similar activities in other parts of the country. However, in some cases they will require support from specialized nongovernmental organizations with experience in the project zone.

- 6.20 Also, UNEPROCH will be able to use the services of private companies to contract and administer personnel and to procure goods, for the purpose of streamlining these activities.
- 6.21 UNEPROCH will have the necessary administrative independence to contract execution of the different project activities with public and private entities, which will make the institutional factor and administrative procedures more flexible.

3. The local counterpart

- 6.22 The local counterpart required for total project financing will be the equivalent of US\$3.5 million over six years of execution, or an annual average of US\$583,000. These resources will be used to finance technical and administrative staff, subsistence allowances, operating costs including contingencies and escalation, and the credit fee for the loan.
- 6.23 The relative impact of this contribution on the central government's investment budget for 1990 and the Ministry of Agriculture's budget will be:

	1990 Investment budget	Annual average contribution	% of investment budget
	(US\$ millions)		
Central government	235.6	0.58	0.002
MAGA	50.5	0.58	1.1

- 6.24 The counterpart resources are not significant in the respective budgets, and given the high priority attached by the government to this project no problems are expected with the timely allocation of counterpart resources.
- 6.25 In the first year of execution (1992), MAGA will ask the Ministry of Finance for a larger budget allocation to cover initial requirements.

C. Environmental feasibility

- 6.26 During the feasibility study, an environmental diagnosis was prepared of the upper Chixoy River valley, which identified the most important environmental problems that currently exist or can be expected to occur if the project is not executed. This constitutes the environmental scenario in the valley "without the project". The environmental effects that can be expected if the

project is implemented were used to configure the future environmental scenario (situation "with the project") which when contrasted with the results of the diagnosis gives a general idea of the environmental benefits and costs associated with the project.

- 6.27 The feasibility study shows that the project, with the recommended characteristics and scaling, will generate three main environmental benefits that correspond to its basic objectives. In the first place, the combined soil conservation measures will reduce erosion in critical areas by about 20%, to acceptable levels, and will have a major impact on the population's economic situation (particularly low-income farmers), through increases in productivity. In the second place, the set of measures to combat erosion proposed for 25% of the watershed will reduce the sedimentation rate in the Pueblo Viejo reservoir from 5.23 to 3.7 million m³ a year, with the consequent effects on electric energy production. In the third place, the proposal will allow small-scale farming and forestry activities to coexist with the production of electric energy for the domestic and Central American markets over the next 50 years in the upper Chixoy River valley without significant identifiable conflicts. The diagnosis shows that this would not be so without the project.
- 6.28 Execution of the project will not cause serious or irreversible adverse changes in the zone, since it focuses on developing and maintaining existing systems and improving their current condition.
- 6.29 The proposals for land use planning, which have taken account of the availability of natural and man-made goods and services, current uses, and the technological absorption capacity of the farmers, ensure that the environmental conditions in which the population in the watershed lives will improve.
- 6.30 The social consultations held, the planned dialogues with community organizations, and the training, awareness and education programs will work together to ensure that the proposed environmental management will be both possible and successful.
- 6.31 The Environmental Management Committee classified the project under category I, i.e., beneficial to the environment, at its meeting on May 7, 1990.

D. Social feasibility

- 6.32 An anthropological study was conducted during the feasibility stage, with special emphasis on the role of community organizations, and another study was conducted on the social justification of the project. A poll was also conducted among 2,100 rural property owners, and an NGO was subsequently hired to consult the population that would potentially benefit from the project. The studies in question were based on a review of secondary sources,

visits, and interviews with key informants from the communities (formal and informal leaders), and with professionals involved in preparing the project. The opinion poll involved 44 interviews (25 groups and 19 individuals) for a total of 563 people.

- 6.33 Interviews showed that the communities were receptive to the project and willing to cooperate with it. Of the 25 communities consulted, 22 expressed an interest in the project and their readiness to participate in attaining its objectives. Since the success of the project will largely hinge on active participation by the population in managing natural resources and in introducing new techniques and crops that are environmentally friendly, this favorable attitude is one of the key elements in determining the project's feasibility.
- 6.34 By creating additional income through the production and extension components and through incentives to encourage the population to participate in the nonproduction components, the project will help to mitigate the dire poverty in which the vast majority of residents in the area live. Since this extreme poverty is one of the chief causes of environmental degradation in the watershed, any action to relieve pressure on its natural resources will help to restore the balance that is characteristic of the traditional relationship between native peoples and their environment.
- 6.35 The existence of many traditional community organizations (such as brotherhoods) and nontraditional ones (such as the pro-improvement committees, cooperatives, informal DIGESA groups, etc.) will facilitate project promotion and public participation. Insofar as it is possible to work through the most innovative and effective organizations and to obtain support from respected leaders, the project will be able to avoid the rejection and mistrust that have greeted many similar projects in the Guatemalan high plateau.
- 6.36 The active participation of about 480 agricultural and 100 agro-forestry promoters who represent their communities will contribute to project acceptance.
- 6.37 The use of incentives will awaken the interest of the more than 12,000 farmers in the area in participating, and will provide small farmers with basic inputs to apply the technological packages to be introduced. The gully erosion rehabilitation component will pay a large number of daily wages, while avoiding the negative impact of paternalistic projects that use "social payment" as incentives.

E. Economic feasibility

1. Introduction

- 6.38 Annex VI-I gives a more detailed explanation of the methodology used, the main working assumptions, and the computation model employed in the economic evaluation of the project. Only the most

important aspects to be considered in reaching a final decision will be touched upon here.

- 6.39 When the project was scaled, the subbasins and microbasins where most of the project benefits would be concentrated and most of the damage avoided were identified. Special areas for the protection of valuable resources were also marked out, as were very degraded zones throughout the watershed where the erosion processes are deep and not superficial, and could potentially cause serious sedimentation and losses in production.
- 6.40 The project's multiple activities were evaluated financially at market prices to analyze the feasibility of the proposed production systems at the farm level, and the rates of return were estimated for each case and situation (with and without the project). The economic analysis was carried out at shadow prices, following the LMST approach.
- 6.41 The computation model developed for this case (written in Fortran) evaluates the project at both prices for a 50-year projection and incorporates a correction for long-term loss of productivity on farmland and forest lands, whose rationale is explained in the annex.
- 6.42 The different production and investment activities for the project were grouped into four programs in an attempt to organize the information for evaluation purposes: (i) agroforestry which associates farming, livestock and forestry activities; (ii) the forestry program itself, which includes intensive and extensive management of natural forests and reforested areas; (iii) natural resource protection program, which includes management of areas with purely protective forest cover, and civil works to rehabilitate gully erosion; (iv) the management, follow-up and evaluation program carried out by the executing unit, the technical department and other general project support units. Since the project has an impact on electrical energy generation in the water, these effects are discussed under "externalities". The monetary transfers from the government to farmers and foresters are recorded under "transfers".
- 6.43 The model also constructs accounts for each interest group that participates in the project. For distribution purposes, it distinguishes among small producers (under 7 ha) and medium to large producers (over 7 ha), workers and salaried labor, government and the rest of society. This approach clearly shows the impact of the project results on each group of beneficiaries. Since the industrial forestry component was not included in the operation, the only beneficiaries are small operators. In the agricultural part, land distribution is close to 1.5 ha.
- 6.44 For the analysis of current land use, levels of technology, practices, current and expected yield, inputs and labor, and other

production and marketing costs, the best available official sources were used, as were the results of similar small projects being carried out in the country by other international technical cooperation agencies. Extensive research was also conducted at the farm level for the purpose of determining "representative" farms by area, community, level of technology and type of farmer. The attitudes of producers to the project proposals and their reaction to the adoption of conservation practices were taken from the anthropological and social study, and particularly from the opinion poll (see paragraphs 6.32 and 6.33).

- 6.45 The price changes that occurred between mid-1989 and mid-1990 made it necessary to revalue the project in both market and shadow prices. This gave the national technical team and the project team the opportunity to make a critical review of the current and proposed production systems, and to pinpoint the areas where each type of activity and management system would be implemented.
- 6.46 The quantifiable and nonquantifiable costs and benefits of the project are described in point 3 of Annex VI-1, which also explains the reasons why some types of benefits could not be computed. The subcomponents and activities that form part of the project concept but which could not be included in the evaluation are listed in point 4 of the same annex. Last, special problems with estimating the loss of soil productivity owing to lack of conservation (case without the project) and the value of the energy externality are dealt with in point 5 of Annex VI-1. Conservative hypotheses were used for the estimates in both cases.

2. Economic returns

- 6.47 The project was evaluated on two occasions. The first in September 1989 and the second in July and August 1990. Some final adjustments were introduced into the later version with regard to operating and investment costs to respond to the principles governing the institutional execution agreements. Other adjustments were made to rationalize the costs of some components intended mainly for environmental protection. When reference is made to an earlier evaluation for reasons of convenience, the pertinent clarifications will be made.

a. General evaluation results

- 6.48 The economic evaluation was performed for a given configuration of SCF and SPL values, known as the "reference case". It is defined as the case with a standard conversion factor (SCF) equal to 0.97 and a labor conversion factor or shadow price for labor (SPL) of 0.708. The total costs and incomes are taken from the final version of project. Variations in the conversion factors in question and in other usual parameters (costs, prices, government spending, etc.) make it possible to obtain supplementary runs for the sensitivity analysis. The discounted value of the energy that

will be saved with the project, or the energy externality was kept at 722,680 quetzales, as in the September 1989 evaluation. ^{14/}

- 6.49 The project evaluation as a whole gives an internal rate of return (IRR) of 13.86% in shadow prices and 11.14% in market prices, with net benefits in present value (NBPV) of 15.2 million quetzales discounted at a rate of 12%. The output produced by the model, which can be consulted in the PRA files, is summarized in Table 1. It includes information and partial results that are worth stressing.

TABLE 1

Final run: reference case in Quetzales

<u>Program</u>	<u>Direct benefits</u>	<u>Total benefits</u>
Agroforestry programs	62,859,850	21,244,400
Soil conservation costs	-5,873,031	0
Agroforestry extension costs	-25,350,120	0
Forestry program	16,112,850	-656,206
Forestry extension costs	-11,950,490	0
Forest surveillance	0	72,268
Protected area plan	-1,293,349	-1,766,038
Civil works gully rehabilitation	-2,661,777	-3,711,058
Externality (energy)	722,680	0
Admin. and management costs (UE, DT, SE)	-17,383,240	0
TOTAL (sum control)	15,183,370	15,183,370
Net benefits market prices	-7,666,801	
Net benefits shadow prices	15,183,390	
Benefits salaried labor	6,100,772	
Benefits government	-56,399,060	
Benefits small farmers (1)	62,306,300	
Benefits large farmers (2)	0	
Benefits unassignable	3,175,400	
Sum (control)	15,183,400	

IRR at market prices (%): 11.14

IRR at shadow prices (%): 13.86

b. Performances by component

- 6.50 The project component that involves farm production, livestock and agroforestry activities has discounted net benefits that comfortably cover the costs of soil conservation and extension. If we add the externality and reduce the costs of the administrative, management and follow up units to be absorbed, the NBPV is 21.2 million quetzales. See Table 1 (first three rows).

^{14/} In the final version, the volume of sedimentation prevented is 1,507,000 m³ less. The NPV drops by approximately 4%, which does not influence the results. Therefore, the earlier estimate was allowed to stand.

- 6.51 The forestry program (intensive and extensive management and plantations), which does not include the agroforestry component but does include indirect costs, bears the direct costs well (16,112,850 - 11,950,490). However, when its share of the costs of the administrative, management and follow-up units is charged to it, it exhibits a slightly negative NBPV of 656,206 quetzales, even after its share of the value of the externality is automatically credited. However, if the NPV of only one of the benefits that were not computed (savings in firewood owing to the Lorena stoves) is added, the forestry program becomes acceptable.
- 6.52 Protection of the forested areas close to the reservoir and gully rehabilitation, whose only net benefit allocated in the evaluation model is their share of the externality, are unacceptable if the criterion of a 12% IRR is applied to them. If the proportional costs of administration, management and follow-up are charged, the results are worse in both cases. The NBPV for management of protected areas is -1,766,038, and for the small scale works to rehabilitate gullies it is -3,711,058 quetzales. These two components merit further consideration, which they are given in the conclusions.

c. Distributional impact: accounts for different interest groups

- 6.53 An analysis of the accounts for the different groups participating in the project, calculated always at the 12% discount in NPV, shows that the largest beneficiaries are small rural producers, with an NBPV of 62.3 million quetzales representing 87.1% of distributable benefits. Salaried labor also receives good dividends (NBPV of 6.1 million quetzales) accounting for 8.5% of benefits, while the government (which is only credited the value of the externality and a small increase in income, while it is charged all the investment and operating costs for the entire useful life of the project) is a net loser (NBPV of -56.4 million quetzales). The difference between market and shadow prices for domestic materials can be assigned to the government or the rest of society. Here they account for 3.2 million quetzales or 4.4% of total benefits and were charged to nonassignables. In other words, 92.6% of the project beneficiaries, in the reference case, are low-income earners.

3. Sensitivity analysis

- 6.54 Eight additional runs were made for a sensitivity analysis of the main project results. The July-August 1990 version was used, which is fully valid for the type of comparison to be illustrated. An increase in production and operating costs equivalent to 10%, without changes in income, is run No. 2 in this series. The inverse case of an increase in prices and income of 10%, without a correlated increase in costs, is represented in run No. 3. In run No. 4 all the operating and investment costs were reduced by 10%.

- 6.55 Based on these results, the rates of return are always above the minimum, and unfavorable changes in costs and/or prices can be weathered with considerable confidence. However, it is also clear that the cost to be shouldered by the government is high, and it would be advisable to study how the results would change if public costs were varied.
- 6.56 It was therefore decided to run two more sensitivity scenarios (7 and 8). The first does not include gully rehabilitation or the plan to protect the area around the reservoir, although it leaves the rest of the programs and the size and cost of the administrative units unchanged. This makes the IRR increase in almost the same proportion as in run No. 4 (where all public costs were reduced by 10%), but in this case part of the project's environmental objectives are removed. Moreover, since all the administrative, technical management, follow-up and evaluation costs now have to be distributed among the two production components, the situation of both worsens, especially that of the forestry program (see Table 1, Annex VI-1). Lastly, if costs and public investments are reduced by 10% and the components mentioned above are left out, the IRR will be 12.45% in market prices and 15.39% in shadow prices.

Table 2

Sensitivity analysis and supplementary runs			
Run No.	Description of main content	IRR market price	IRR shadow price
1	Reference case, July-August 1990 ^{15/}	10.74%	13.43%
2	Increase production costs 10%	9.99%	12.73%
3	Increase prices and income 10%	12.09%	14.89%
4	Reduce operating and public investment costs by 10% in all programs	11.47%	14.28%
5	SPL = 0.90	10.74%	12.99%
6	SCF = 0.90	10.74%	14.34%
7	Remove civil works and forest protection plan	11.70%	14.49%
8	Combine reduction in operating and public investment costs and run No. 7.	12.47%	15.39%

^{15/} See Table 2 (Annex VI-1).

In conclusion:

- 6.57 In the light of the results obtained, the project as a whole is economically feasible, exceeds the minimum IRR in shadow prices, and is reasonable in market prices.
- 6.58 In considering the main production components, which account for and sustain 92% of the total project budget, the convention of the minimum IRR is also complied with. Only the subcomponents of protected areas in the reservoir zone and the gully rehabilitation works would be unfeasible, judging by this single criterion, which is considered overly restrictive in this case. The two activities have additional benefits whose magnitude is difficult to determine at present. Considering the time it will take to execute the project and the projections, it is very clear that sooner or later these activities will have to be carried out. The area around the reservoir will be declared a natural reserve and will have to be protected; in the case of gully rehabilitation, pilot projects should be embarked upon which, in addition to solving very visible problems, will generate more precise quantitative information on the costs, physical effects and principal economic benefits. To postpone action is to remain in the dark, increase real future costs, and lose the advantage of controlling or preventing the consequences now.
- 6.59 Moreover, postponement would fail to take advantage of the institutional capacity that the project creates, the technical assistance that will be available, and the possibility of doing something useful with community effort. For these reasons, it is proposed that protection of the reservoir area and gully rehabilitation and control be included in the program on the grounds that these are necessary, supplementary environmental operations that can be carried out at minimum cost.

F. Project justification and risks

- 6.60 The project has important long-term goals, which consist of a fundamental step towards environmental protection and management of renewable natural resources in Guatemala. Preferential attention to a region mainly populated by indigenous small farmers who have been left out of the development process justifies taking immediate steps. Activities such as those proposed will raise the standard of living of area residents, guaranteeing sustainable growth that makes comprehensive use of environmental goods and services, which could help to reduce the social and political instability that still prevails in the watershed.
- 6.61 The actions under consideration will improve productivity, particularly with regard to staple crops, and contribute to the food security of a vulnerable and impoverished population. Crop diversification and the incorporation of agroforestry systems will allow for more efficient land use and more active participation by

rural women. Forest management will meet the rural community's need for firewood, and will help improve the quality and production of the forest biomass.

- 6.62 Soil conservation plays a determining role in guaranteeing that production can be maintained or improved, and in preventing erosion and silting processes from shortening the useful life of the Pueblo Viejo-Quixal hydroelectric plant and the future plants planned for the Chixoy River valley.
- 6.63 Although there are various sociocultural and economic factors which indicate that the project will be a success, there are certain limitations and institutional and social risks that might affect it.
- 6.64 Project execution requires adequate interinstitutional coordination between public and private sector entities and the beneficiary communities. UNEPROCH will be responsible for this function and it will establish the legal mechanisms that define the role to be played by each organization through agreements and contracts. Although this is a normal mechanism in multisectoral projects, there could be risks in implementing it if one or more of the following factors apply: (i) inadequate organization of UNEPROCH, insufficient independence, levels of personnel; (ii) lack of participation by one or more of the entities involved; (iii) excessive bureaucratic red tape in procuring goods and services; or (iv) insufficient allocation of counterpart resources. Precautions have been taken to reduce these risks both with regard to the structure of UNEPROCH and by including special conditions in the normative documents.
- 6.65 It was initially thought that small farms and their pressure on land could constitute factors that might hamper project execution. However, after a detailed study of land registration and the regularization of tenancy, it has been concluded that it is not feasible to include a land regularization component because: (1) most of the indigenous population in the area, particularly in zones that were centers of armed conflict, will be opposed to land surveying and registration out of fear that their land will be confiscated or that they will have to pay taxes; (2) the project does not involve credit programs or other activities that might require land ownership titles as guarantees for credit operations; (3) there is no adequate institutional infrastructure for creating and maintaining land registers or carrying out a program to regularize land ownership; (4) Guatemalan agrarian law contains no provision for combining traditional indigenous legal practices with Western law.
- 6.66 Extreme poverty is a limiting factor since it could stand in the way of community willingness to work on projects that are not directly productive. However, it is believed that social

incentives such as those defined for the project will encourage participation in project work.

- 6.67 Social and political conflicts in some communities (particularly in critical subbasins in the Quiché) currently pose some difficulties for project execution. As a result, work will only be done in communities that agree to participate.
- 6.68 Inter-ethnic conflicts may stand in the way of acceptance of the project since non-indigenous technicians are often viewed with suspicion or mistrust, owing to the long history of underestimation and of discrimination against native peoples. Last, monolingualism may also pose a constraint. Although most of the agricultural representatives, supervisors and technicians will be bilingual, the immense variety of Mayan dialects may lead to communication problems.

VII. RECOMMENDATION

7.1 For the above reasons, the proposed project is feasible from the technical, economic, financial, institutional, environmental and legal points of view. Consequently, it is recommended that the loan be approved, and the following normative documents are therefore submitted for consideration by the Board of Executive Directors:

- Proposed Resolution - FSO
- Recommendations
- The Project (Annex A to the Loan Contract)
- Tender Procedures (Annex B to the Loan Contract)
- Selection and Contracting of Consulting Firms and/or Individual Experts (Annex C)

G U A T E M A L A

Frame of Reference

A. Recent Economic Trends

- 1.01 During 1990 the Guatemalan economy grew at a moderate 3.5 percent rate but experienced substantial inflationary pressures as a result of the growing losses of the Bank of Guatemala. Rapid and erratic depreciation of the currency fueled by strong speculative demand for foreign exchange resulted in further inflationary expectations, increasingly negative real interest rates, and capital flight. By year's end inflation reached a record 60 percent while the rate of exchange reached a peak of 6 quetzales per dollar in September.
- 1.02 Economic growth was registered in all sectors, with the exception of construction. Agricultural output expanded at a moderate rate because of the greater production of coffee, sugarcane, and basic grains. The production of coffee, the main export crop, increased by 11 percent as a result of efforts to improve yields. Sugarcane output was fostered by the almost-doubling of the U.S. sugar quota allocated to Guatemala and the higher preferential international price, which resulted in a significant expansion of the area planted. Total basic-grain and legume production, particularly of beans, rose considerably, reflecting the completion of small-scale irrigation projects in late 1989. Preliminary information on nontraditional agricultural production indicates an expansion in the exportable output of these products, which was favorably affected by the real effective depreciation of the quetzal during 1989. Manufacturing output, particularly production destined to foreign markets, continued to expand, albeit at a slow pace.
- 1.03 After three years of rapid growth, construction activity fell by 2 percent, owing primarily to the contraction in public investment, particularly in infrastructure, and to the slowdown in private sector building.
- 1.04 The consolidated public sector deficit increased by almost 1 percentage point of GDP to an estimated 4.5 percent as a result of continued exchange and operating losses of the Bank of Guatemala, which rose to an estimated 2 percent of GDP from 1.1 percent in 1989. These losses stem primarily from exchange rate guarantees to exporters and importers, the subsidized rate of exchange for petroleum imports, and operating losses. During 1990, exchange losses were derived mostly from the payment of petroleum imports at

a fixed preferential rate of 3.29 quetzales per dollar while the central bank had to purchase the required foreign exchange at a higher fluctuating market rate. Operating losses, which account for about half of the total, were the result of the significant differential between the central bank's interest-earning assets, mostly fiscal bonds, and its interest-bearing liabilities, mostly on foreign liabilities and on bonds sold in open-market operations.

- 1.05 In response to falling total revenues, the authorities sharply curtailed expenditures so that the overall fiscal deficit of the central government was slightly lower than that of the previous year. Guatemala's tax burden, already one of the lowest in Latin America, experienced an additional drop of 1 percentage point of GDP, to less than 7 percent. This drop was the result of a decline in export tax revenues derived from lower international coffee prices, from exemptions associated with the export promotion law of 1989, from reduced import tariffs, and from increased evasion. Curtailment of wage and salary increases and the elimination of transfers to the state electricity company (INDE) only partially offset the large fiscal shortfall, so that the current account deficit widened to a little more than 1 percent of GDP. The overall deficit of the central government was kept at a slightly lower level than that of 1989 at the expense of an additional cut in the already-low level of fixed investment. The deficit was financed to a large extent with domestic resources, including floating debt and government bonds held by the private sector, offered at attractive interest rates. The rest of the public sector posted a further reduction of a modest surplus as the higher electricity prices were compensated by the reduction of transfers from the central government and by the increase of interest payments in terms of local currency because of the devaluation of the quetzal during 1990.
- 1.06 The expansion of net domestic credit, in relation to the stock of liabilities to the private sector outstanding at the beginning of the period, increased substantially from 15.8 percent in 1989 to 27.7 percent in 1990. An important component in the acceleration in the credit expansion was the almost-doubling of the net losses of the Bank of Guatemala in the same period. Notwithstanding the rise in nominal interest rates, real interest rates became increasingly negative as inflation accelerated during the year.
- 1.07 The trade balance improved further during 1990. The value of exports grew by 7.5 percent, primarily because of an important expansion in nontraditional products, while the sale of traditional products remained at virtually the same level as during the previous year. Nontraditional exports - mainly chemicals, vegetables, flowers, and fruits - were very strong as their sales expanded by an estimated 24 percent. This performance reflected the increased competitiveness of Guatemalan products as a lagged result of the real effective depreciation of the quetzal during

1989. The performance of traditional products was uneven. Coffee earnings fell by 17 percent as a result of the sharp drop in international prices, which more than offset the increased volume sold. Coffee's poor performance contrasted sharply with the significant dynamism of sugar sales, which stemmed from the important growth in volume and the higher price in the protected U.S. market. Imports fell slightly with respect to the high 1989 level, primarily because of the real depreciation of the currency during most of 1990 and the requirement of prior deposits in quetzales equivalent to 200 percent of the value of foreign exchange purchased. The resulting reduction in the trade deficit combined with continued significant remittances from Guatemalan residents abroad resulted in the narrowing of the current account deficit by about 0.5 percentage points of GDP to 3.8 percent in 1990. The level of net capital inflow reflected reduced gross disbursements from the multilateral institutions as arrears with these institutions accumulated, as well as the decline in loans from bilateral sources and the contraction in net private capital inflows. Net international reserves fell steadily throughout 1990 by an estimated \$143 million.

- 1.08 The deterioration in the capital account was exacerbated by significant instability in the exchange rate market. The devaluation of the quetzal was significant between mid-January through September, from 3.5 quetzales per dollar to 6 quetzales per dollar, with erratic fluctuations in response to the numerous exchange rate regimes implemented during this period. The process stabilized during the last quarter, when the Monetary Board changed once more the exchange rate regime, this time to an auction system with a band. In fact, although between January and September the currency depreciated by 19 percent in real effective terms, between October and December the quetzal appreciated, a trend that continued through April 1991. Even so, for the year as a whole the quetzal depreciated in real effective terms by 20 percent. Inflationary pressures accelerated throughout the year, reflecting the substantial devaluation of the currency, adjustments in fuel prices according to the higher international oil prices, and increases in electricity prices. The consumer price index registered an unprecedented average increase of 41 percent, and the twelve-month inflation rate was a staggering 60 percent. This state of affairs translated into a marked contraction in real wages of about 18 percent and an additional deterioration in the standard of living of large segments of the population.
- 1.09 Guatemala's total external indebtedness was increased by about 4 percent during 1990, as the reduction in the debt of the Bank of Guatemala was more than compensated by the increased public sector debt. Arrears on the external debt built up significantly by about \$200 million in an effort to slow down the steady drain of net international reserves, so that external payments arrears of

Guatemala's public sector, including those of the Bank of Guatemala, had increased to \$469 million by year-end 1990. Of this amount, about \$150 million represented arrears of the nonfinancial public sector, mostly to the multilateral organizations, and the rest represented arrears on the debt of the Bank of Guatemala and of the National Financial Corporation (CORFINA). Both the Central American Bank for Economic Integration (CABEI) and the multilateral institutions suspended new disbursements to Guatemala during most of 1990.

B. Economic Policies

- 1.10 The primary concerns of the Guatemalan authorities during 1990 were to stabilize the economy and to control the excess liquidity, but the results of the economic policy measures employed to pursue these ends were less than satisfactory because the measures were partial in nature and did not form part of a comprehensive adjustment program.
- 1.11 The Bank of Guatemala adopted several measures in an effort to reduce its substantial exchange and operational losses and to control the excess liquidity stemming from these losses. As noted previously, these losses were the result of exchange rate guarantees on letters of credit for imports and on advance payments for exports, the subsidized exchange rate for petroleum imports, and operating losses. First in April and later in July, the Monetary Board increased the exchange rate used to import petroleum products, hence reducing the exchange rate subsidy. Nevertheless, these modifications were not enough to counter the impact of sharply rising international oil prices in the second half of the year, and heavy losses ensued. Little was done to reduce the central bank's operating losses as fiscal bonds accrued below-market interest rates while steps were taken to increase the rates on open-market operations.
- 1.12 In order to stabilize exchange rate movements and in response to the sharp deterioration of the quetzal through February 1990, the Bank of Guatemala modified the floating exchange rate system introduced in November 1989, by establishing a band of two percentage points within which the rate could fluctuate in relation to the average of the preceding week. Unfortunately, the central bank was not able to intervene when the market faced an excess demand for foreign exchange as the Bank of Guatemala did not have the reserves to undertake counteractive measures. On May 30, 1990, this first band system was replaced with an auction market in which allocations were made according to the closeness of the bid price to the average price. The ensuing sharp appreciation of the quetzal led the authorities to modify that system in August, to a Dutch auction system whereby foreign currency was actually sold to the highest bidders. In late November the current regime was instituted; this present auction system has a maximum permissible

band of fluctuation of .05 quetzales around a base exchange rate set by the Bank of Guatemala. The mechanism provides for a devaluation of the base rate if the average of the prices bid exceeds the limits of the band for 15 consecutive days.

- 1.13 Measures were also taken to control the excess liquidity stemming from the remaining losses of the central bank. In fact, in July the Monetary Board authorized the Bank of Guatemala to set interest rate levels on open-market operations as well as the amount of these bonds to be offered for sale. The maximum maturity on open-market instruments was increased from three to six months, and the corresponding interest rate was adjusted by 7 percentage points to 25 percent. Only in August did open-market operations begin to improve. In effect, the monetary authorities began to auction bonds (CENIVACUS) to the private sector on a weekly basis and allowed the interest rates to be determined by the market, up to a maximum rate still set by the bank. Between August and December, the one-month interest rates rose to 18.3 percent while the six-month rate reached 35 percent. In a further effort to control credit expansion, a process of gradual unification of the legal reserve requirement was initiated in August, as the large differentials that prevailed at the time - 41 percent on sight deposits and 13 percent on time and savings deposits - allowed commercial banks to circumvent the efforts to tighten the monetary policy. The legal reserve requirement was unified at 20 percent in February 1991. Additional efforts to reduce excess liquidity included several increases of the required pre-import deposit in local currency, from 25 percent in May to 200 percent in September, as noted earlier. These changes coincided with the adoption of different exchange rate regimes during the year.
- 1.14 In the area of external sector policies, various reforms were adopted aimed at facilitating international trade. In March 1990, the government simplified the tariff structure by reducing the number of rates to six and by lowering the average import tariff level as well as the dispersion of these tariffs so that the maximum import tariff was set at 40 percent while the minimum tariff was increased from 1 to 2 percent. Also, during 1990 the regulations of the export incentives law were completed. This law, originally approved in 1984, was modified in 1989 so that exporters are now exempted from customs duties, from income taxes for ten years, and from any export taxes.

C. Outlook

- 1.15 The new administration that came into power in January 1991 was faced with serious disequilibria, both internal and external. Shortly after taking office, the president announced his commitment to reducing inflation and to stabilizing the exchange rate. In support of these objectives, the Monetary Board approved in February a monetary and exchange rate policy proposal that would be

in effect for the duration of 1991. These measures are expected to be more successful than those implemented in 1990, as some of the conditions that prevailed in that year will no longer be in existence.

- 1.16 The proposed monetary policy will be restrictive during 1991. To control the expansion of credit, the monetary authority will seek to avoid base money expansion stemming from the Bank of Guatemala's losses and will actively use open-market operations, adjust the minimum legal reserve requirements, and freeze net credit outstanding to the central government.
- 1.17 The Bank of Guatemala intends to continue with the current exchange rate regime. In this system the maximum annual built-in nominal depreciation of the currency is estimated at 16 percent. Even so, the task of stabilizing the quetzal will be very difficult if the central bank does not have the international reserves to intervene effectively to smooth expected fluctuations, so that a return to the Dutch auction system, in place during August and September of 1990, may be inevitable.
- 1.18 Even though no significant real effective depreciation of the currency during 1991 is foreseen, a reduction, albeit modest, in the trade deficit could be expected. Rapid expansion of nontraditional exports, stemming from the effects of the substantial real effective depreciation of the currency that occurred during most of 1990, combined with a recovery in international coffee prices would more than compensate the relatively modest growth of imports predicted in view of lower oil prices and the restrictive monetary policy.
- 1.19 Although the deficit of the central government is not yet a problem in terms of its magnitude, the tax burden and fiscal spending are being held quite low and are not adequate to meet some of the most basic needs of the population. Hence, a substantial and permanent increase in the tax burden is essential, and the authorities have in fact presented Congress with proposals for revenue measures. These measures include the revision of some taxes - primarily the value-added tax and the income tax, so as to eliminate some fiscal exonerations and thus broaden the tax base - and the increase of the tariff floor to 5 percent and reduction of the ceiling to 20 percent. If this package is approved, the tax burden could go up by 0.5 percentage points of GDP during 1991 and by a full 1 percent in 1992.

Social and cultural characteristics

In the world view of the native peoples, traditional lifestyles and agricultural practices are expected to remain changeless for evermore, which explains why native campesinos fitting the traditional mold have proven resistant to change and novelty and prefer to stick to subsistence agriculture. In addition, the very remoteness of development – and the harsh reality of poverty – in the lives of the vast majority of the valley's native population, combined with the political violence that plagued the region between 1979 and 1984, have further reinforced the attitude of mistrust and resistance to innovations brought in from outside the community.

The high population density (up to 200 inhabitants per square kilometer in certain parts of the basin) and the prevalence of smallholding patterns in the region, have been compounded by the rapid growth in the rural population (at an average rate of 3.5 percent per year), resulting in a substantial increase in pressures on the land. At the same time there has been a reduction in seasonal migration to the south coast and permanent migration to the city. Since the last quarter of the eighteenth century, the indigenous population of the Altiplano region has descended to the south coast on a seasonal basis to provide the manpower necessary to harvest export commodities, primarily coffee, sugar, and cotton. However, the decline in these commodities has reduced this sector's capacity to absorb manpower. Recent studies have indicated that in terms of labor time spent on temporary self-employed activities, the average was 45 person/household/days in Huehuetenango and 31 days in Quiché. This compares with studies from the 1960s which estimated that seasonal migration took up perhaps between 80 and 90 person/days per household per year. Similarly, the current stagnation in the nonagricultural industrial sector means that that sector offers no employment alternatives in urban areas, apart from in the already glutted informal sector. These socioeconomic factors further reinforce the native campesinos' firm determination to remain in the area and to work their land, since they have no other attractive options.

In spite of the traditional resistance to change, there are many examples which prove that when the native campesino owns a plot of land fractionally larger than that needed to ensure subsistence levels plus some degree of access to credit and training, he will be prepared to experiment with new crops and new technologies. The shrinking numbers of attractive options, combined with the close relationship between the land and sociocultural identity, mean that access to land and land conservation develop into key priorities from the campesino's point of view. The native farmer at present faces no cultural obstacles to changes in his farming practices if these will enable him to make a better life for himself with his land. Many farmers are already sowing nontraditional crops for export, using chemical fertilizers and

pesticides, and are proving ready and willing to embrace new practices, provided that they can individually and collectively grasp the benefits that will accrue to them from these new practices. They wish to ascertain the effectiveness of new harvests, chemicals, and practices before they go ahead and adopt them on a massive scale. The unfortunate experiences with some programs have in many cases been attributable to the fact that the programs did not include sufficiently powerful and effective training and demonstration components.

The social organization of the native peoples must be a major consideration in devising measures for improving the socioeconomic status of the native population, in the sense that efforts must be made to avoid imposing organizational styles that will encounter resistance from native people. Traditionally, the most important institution in a village was the cofradía, or brotherhood, an organization of syncretic origin revolving around the worship of a Catholic saint, and based on the principle of the obligation to render service for a limited period of time. The brotherhood was also a mechanism for the redistribution of wealth, since the act of taking on a major position within a hierarchical, stratified system necessarily entailed underwriting the costs of celebrations [fiestas] and other activities of the brotherhood; depending upon the rank of the position occupied within the hierarchy, these expenses would frequently amount to several times the annual income of the particular member of the brotherhood. In the old days, the brotherhood was in a very real sense the civil government of the native people. However, changes in Guatemalan law and the inroads made by traditional catholicism and evangelical christianity have sapped the strength of the brotherhoods. Although they remain important in the village communities of the Altiplano, they have nonetheless evolved into purely religious organizations, to all intents and purposes uninvolved in development activities.

The period beginning around 1970 -- and most particularly after the 1976 earthquake -- witnessed the emergence of "Pro-Improvement Committees" [Comités Pro-Mejoramiento] in the towns and villages of the rural areas of Guatemala. The earthquake was important in that it necessitated the formation of a legally recognized mechanism for enabling the stricken communities to receive aid from national and international agencies. These committees usually consist of a chairman, a vice-chairman, a secretary, a treasurer, and one or more committee members, seldom exceeding 10 people. The committee is elected at an assembly attended by the entire community and requires legalization from the appropriate government department before activities involving the administration of funds can be allowed to get under way. A term of office on the committee varies in length, although it is usually for one year or until such time as the project for which the committee was first established is finally completed. These committees have sought primarily to improve the physical infrastructure of services, e.g., by introducing potable water, introducing or extending electric power, building schools, health stations, or by improving and upgrading roads, etc. The committees are almost always set up in response to a felt need within the community in

question. There are communities in which there is just one pro-improvement committee responsible for all activities; in other communities there are different committees for different activities. The number of committees in 13 of the 32 municipalities in the area of the upper Chixoy is 375.

The cooperative movement has not had a major impact on the area of the upper basin of the Chixoy River. However, the existing cooperatives are associations of farmers with the potential to become involved in the project, especially in activities soil conservation activities. A further form of organization is to be found in the local development committees, which first emerged with the enactment of the new Constitution in 1985. The local development committees are organized in the same way as the pro-improvement committees; they may, however, solicit funds directly from the Government of Guatemala.

In some communities, the agricultural representatives of DIGESA have managed to establish organizations involving the farmers. But such organizations, requiring no official legalization to operate, are frequently of an informal and temporary nature. As with the pro-improvement committees, some of these groups function well, while others do not, depending upon the skills of the agricultural representative in question. In certain communities there are also organized groups which have formed to participate in irrigation projects; some of them are legally incorporated and are able to administer funds.

In addition to these community-level organizations, one encounters a series of nonprofit associations which encompass several communities and which are primarily aimed at promoting the development of their member communities and implementing work mechanisms to involve their inhabitants at all levels involved in the development process. The most important of these associations is the Western Rural Development Corporation [Corporación para el Desarrollo Rural del Occidente (CDRO)] which was formed in the department of Totonicapán in April 1981. CDRO is 100 percent native in its personnel and in the focus of its activities. CDRO's activities fundamentally entail training CDRO community leaders and bringing together the various community organizations. CDRO has had access to the resources of various international nongovernmental organizations (NGOs), and is associated with the Community Services Center [Centro de Servicios Comunitarios (CESERCO)] in Totonicapán and with the Integrated Development Methodist Foundation [Fundación Metodista de Desarrollo Integral (FUMEDI)] in Quezaltenango. Similar organizations are in operation or emerging in other departments in the project zone.

**GOALS OF THE SOIL CONSERVATION AND
AGRICULTURAL PROMOTION PROGRAM**

TABLE 1: Surface area for solid conservation practices

Sub-basin	Total surface area clean crop	Surface area terraces	Surface area integrated systems	Surface area special intergrated systems
Pacaranat	3,833	280	3,198	355
Serchil	703	-	633	79
Río Blanco	828	112	644	72
Río Negro	490	-	441	49
	1,181	-	1,063	118
TOTALES	7,035	392	5,978	664

TABLE 2: Percentage of incremental areas in respect of soil conservation

PRACTICE	X					
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Terraces	5	10	15	20	25	25
Integrated and special integrated	10	15	15	20	20	20

TABLE 3: Incremental beneficiaries of the project, by sub-basin

INCREMENTAL BENEFICIARIES (number of farmers)								
SUB-BASIN/ SYSTEM	YEAR 1		YEAR 2		YEAR 3		YEAR 4	
	No.	%	No.	%	No.	%	No.	%
Pacaranat/Syst. 1	744	10	1,116	15	1,116	15	1,488	20
Serchi/Syst. 2	185	10	277	15	277	15	369	20
Río Blanco/Syst. 3	136	10	204	15	204	15	271	20
Molino/Syst. 4	61	10	92	15	92	15	122	20
Río Negro/Syst. 5	99	10	149	15	149	15	198	20
TOTALES	1,225	10	1,838	15	1,838	15	2,448	20

ANNUAL GOALS OF THE FORESTRY COMPONENT

1. Physical goals	Y E A R S						TOTAL
	1	2	3	4	5	6	
1.1 Forestry activity and management	18	4	-	-	-	-	22
1.2 Communities brought into the project, No.	3	20	23	23	24	22	115
1.3 Intensive management plans							
No.	1	4	5	5	5	5	25
Hectares	200	800	1.000	1.000	1.000	1.000	5.000
1.4 Extensive areas, hectares							
No.	2	16	18	18	19	17	90
Hectares	1.000	8.000	9.000	9.000	9.500	8.500	45.000
1.5 Demonstration areas, hectares							
(a) Resin extraction							
No.	2	2	4	4	4	-	16
Hectares	2	2	4	4	4	-	16
(b) Seed collection stands							
No.	1	2	2	2	1	-	8
Hectares	4	8	8	8	4	-	32
(c) Thinning plots							
No.	1	2	2	1	1	1	8
Hectares	1	2	2	1	1	1	8
(d) Renewal cutting plots for natural regeneration							
No.	2	4	4	4	4	2	20
Hectares	0.2	0.4	0.4	0.4	0.4	0.2	2.0
(e) Silvicultural plots (with and without cattle)							
No.	4	4	4	4	4	-	20
Hectares	2.8	2.8	2.8	2.8	2.8	-	14
(f) Burnings prescribed							
No.	4	8	8	8	8	4	40
Hectares	2	4	4	4	4	2	20
(g) Enrichment reforestation							
No.	4	8	8	8	8	4	40
Hectares	2	4	4	4	4	2	20
(h) Species testing plantations							
No.	8	8	8	8	8	-	40
Hectares	4	4	4	4	4	-	20
(i) Total demonstration areas							
No. of plots	26	38	40	34	38	11	192
Hectares	18	27.2	29.2	28.2	24.2	9.2	132
1.6 Execution of intensive management plans							
(a) Pruning Hectares	0	4	17	33	49	65	168
(b) Thinning Hectares	0	16	68	132	196	260	672
(c) Renewal cuttings Hectares	0	2	8	16	25	32	83
(d) Enrichment reforestation Hectares	0	1	4	8	12	16	41
(e) Plantations Hectares	0	1	4	8	10	15	38
(f) Controlled silvicultural Hectares	0	12	51	99	147	195	504
1.7 Execution of extensive management plans, Hectares							
(a) Elimination of dead, diseased and overmature trees	36	288	324	324	324	306	1.602
(b) Cattle control Hectares	20	160	180	180	190	170	800

1.8	Resin extraction							
	No. of trees	2.000	4.000	5.000	5.000	4.000	4.000	24.000
	Hectares	43	83	104	104	83	83	500
1.9	Total execution. Management plans over the six years of the project, hectares							<u>4.426</u>
2.	<u>Forest management outreach and motivation targets</u>							
2.1	Meetings with campesino communities	140	150	198	198	200	200	1.086
2.2	Pep talks	300	310	425	425	430	430	2.320
2.3	Seminars	38	40	54	54	55	55	296
2.4	Educational tours	20	22	28	28	30	30	158
2.5	Screening of educational films	12	24	24	24	24	24	132
2.6	Conducting of socioeconomic surveys	12	8	-	-	-	-	20
2.7	Radio messages	6	5	-	-	-	-	11
2.8	Preparation of newsletters	20	20	20	20	20	20	120
2.9	Radio programs	100	100	120	120	120	120	680
3.	<u>Physical targets of agroforestry systems</u>							
3.1	Incorporation of activities of agroforestry (number)	30	40	30	-	-	-	100
3.2	Families brought into the project (number)	100	200	400	600	800	1.000	3.100
3.3	Areas incorporated:							
	(a) Silvi-pastoral systems:							<u>372 a/</u>
	- Live fences to plant (meters)	4.900	9.800	19.600	30.093	41.500	52.700	15.893
	- Trees existing with pastureland (hectares)	3	6	12	18	24	30	93
	- Windbreaker curtains with pastureland (hectares)	7	14	28	42	56	70	217
	- Other silvi-pastoral systems (hectares)	2	4	8	12	16	20	62
	(b) Taungya systems:							<u>682</u>
	- With timber trees (hectares)	12	24	48	72	96	120	372
	- With fruit trees (hectares)	10	20	40	60	80	100	310
	(c) Crop systems intercropped with permanent trees:							<u>496</u>
	- With timber trees (hectares)	5	10	20	30	40	50	155
	- With fruit trees (hectares)	7	14	28	42	56	70	217
	(d) Other systems (hectares)	4	8	16	24	32	40	124
	(e) Total areas brought into the agroforestry systems (hectares)	50	100	200	300	400	500	1.550
	(f) Trees planted							<u>1.290.000</u>
	Timber trees (number)	70.000	70.000	150.000	210.000	380.000	280.000	1.130.000
	Fruit trees (number)	6.000	11.000	18.000	35.000	45.000	45.000	160.000
	(g) Community nurseries (No.):	5	12	20	20	25	25	107
3.4	Demonstration plots (hectares):	2.50	5	10	15	20	25	77.50
	(a) Silvi-pastoral systems:							
	- Live fences (meters)	1.715	2.450	2.548	1.505	2.075	2.635	9.553 b/
	- Trees existing with pastureland (hectares)	1.05	1.50	1.56	0.90	1.20	1.50	7.71
	- Windbreaker curtains (hectares)	2.45	3.50	3.64	2.10	2.80	3.50	17.99
	- Total number of existing trees	40	56	59	34	45	56	290
	- Total number of planted trees	1.348	1.925	2.002	1.173	1.598	2.018	1.064
	(b) Taungya systems:							
	- With timber trees (hectares)	4.20	6	6.24	3.60	4.80	6	30.84
	- With fruit trees (hectares)	3.50	5	5.20	3	4	5	25.70
	(c) Crop systems intercropped with permanent trees:							
	- With timber trees (hectares)	1.75	2.50	2.60	1.50	2	2.50	12.85
	- With fruit trees (hectares)	2.45	3.50	3.64	2.10	2.80	3.50	17.99
	(d) Other systems (hectares)	1.90	2	2.08	1.20	1.60	2	10.28

a/ Corresponds to 132 hectares (not included in the total target of 372 hectares for the silvi-pastoral systems).

b/ Corresponds to eight hectares (not included in the total target of 77.5 hectares for the demonstration plots).

3.5	Total trees planted							1.560.000
	- Timber trees planted	50.000	100.000	190.000	220.000	390.000	284.000	1.384.000
	- Existing timber trees	88	152	251	322	555	536	2.000
	- Fruit trees planted	17.000	15.000	23.000	38.000	48.000	46.000	174.000
4.	<u>Agroforestry outreach and motivation targets</u>							
4.1	Community meetings	150	200	200	200	200	200	1.150
4.2	Pep talks	100	150	200	260	260	260	1.230
4.3	Screening of films	6	12	24	36	48	48	180
4.4	Educational tours	3	6	12	12	12	12	57
4.5	Field days	12	24	24	24	24	24	132
4.6	Visits to farms and homes	200	200	200	200	200	200	1.200
4.7	Short courses	2	4	8	10	10	10	44
4.8	Radio programs g/	100	150	150	200	200	200	1.000
4.9	Printing and distribution of leaflets and technical guidebooks	-	2	3	3	4	4	16
4.10	Preparation and distribution of posters	7	2	3	3	4	4	16
5.	<u>Forest protection and management targets</u>							
5.1	Forest scouts brought into the project	10	15	5	-	-	-	30
5.2	Construction of observation towers for forest fire control	-	4	4	-	-	-	8
5.3	Incorporation of areas protected against fires, hectares	3.000	25.000	60.000	40.000	18.000	-	146.000
5.4	Probable annual fires, No.	75	54	45	39	33	30	222
5.5	Maximum annual area of burning anticipated in the 146.000 hectares d/	8.700	7.700	6.600	4.300	2.900	1.500	31.700
5.6	Prescribed burnings, hectares	100	100	100	100	100	100	600
5.8	Maintenance of rounds, km			20	50	80	100	250
5.9	Numbers of cutting licenses granted in the forests under management g/	4	20	23	23	24	23	117
5.10	Maximum deforestation of the 146.000 hectares	2.250	2.100	1.800	1.500	960	74	9.350
5.11	Total forest area brought under forest control in the basin, hectares	5.000	35.000	80.000	100.000	90.000	-	310.000
5.12	Taking of aerial photographs for monitoring, hectares	-	550.000	-	-	-	-	550.000
6.	<u>Total goals for reforestation and improved wood-burning stoves</u>							
6.1	Reforestation by means of financing production of the project's plants f/							
	- Area, hectares	-	52	108	266	293	381	1.100
	- No. of plants to be produced g/	50.000	150.000	360.000	540.000	640.000	360.000	2.100.000
6.2	Reforestation covered by the Forests and Agroforestry Management Program							
	- Area, hectares	50	100	200	300	400	500	1.580
	- Number of plants to be produced	75.000	170.000	250.000	300.000	390.000	380.000	1.535.000
6.3	Improved stoves							
	- Total number of stoves to be established	500	1.000	1.200	1.300	1.000	1.000	6.000
	- Fuel saving, MIS3 of wood	1.950	2.080	2.210	2.340	2.470	2.600	13.650 ^{h/}
	(e) That would correspond to the deforestation of 195 hectares of forest at a rate of 70 cubic meters/hectare							

g/ Days on which there are to be broadcasts.

d/ Number of times that the material will be distributed: 3.100 leaflets altogether.

e/ Including areas that will not be deforested by the burning.

f/ Areas of forest under management at the end of the project, 50.000 hectares.

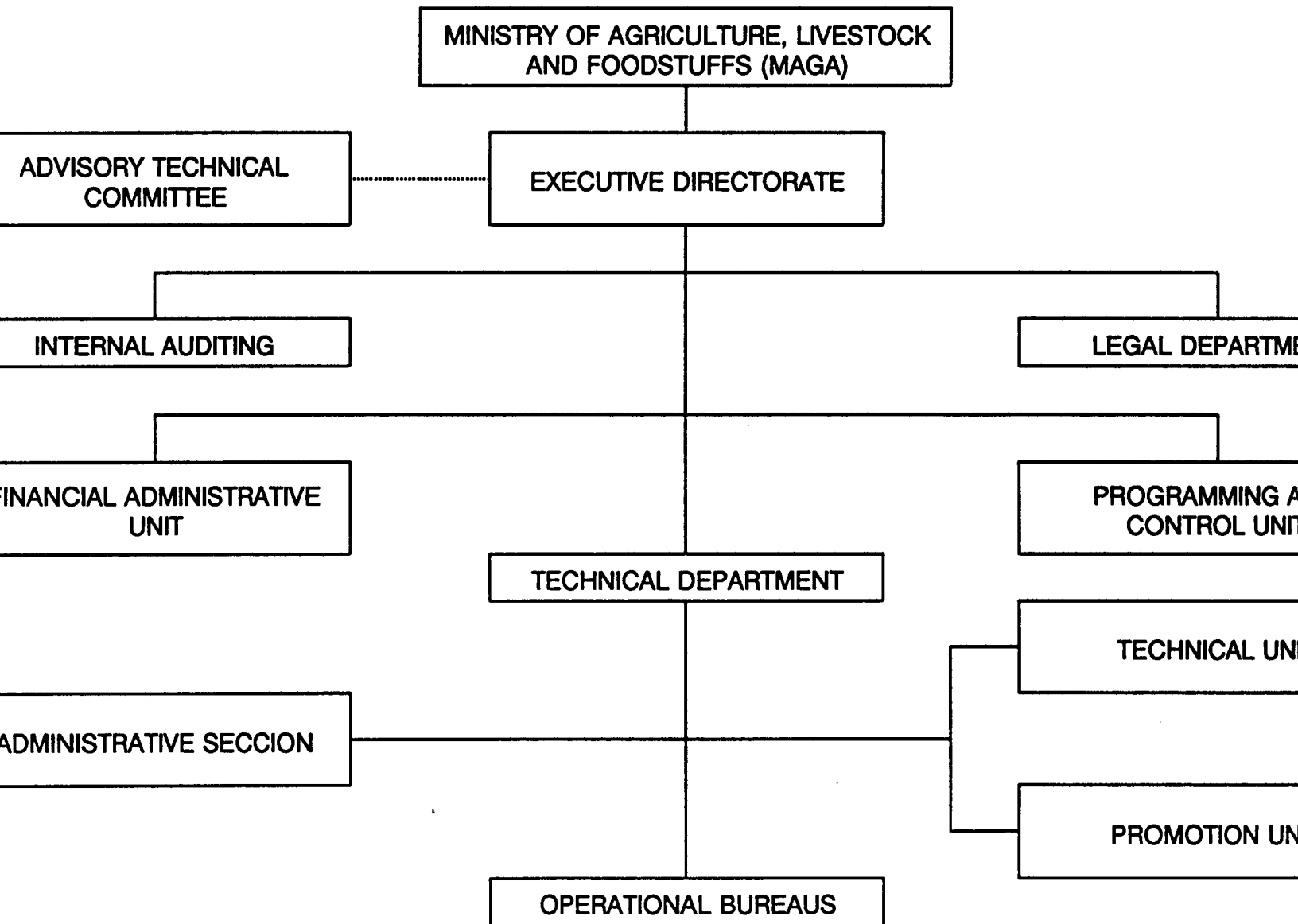
g/ Reforestation will be implemented through the basin, but 80 percent will be carried out in the six selected sub-basins of Rio Negro, Suchil, Pacaramat, Chilil, Salamá, and Chicruz. Does not include reforestation on forest management with a total surface of 1.590 hectares and 1.6 million trees to be planted).

h/ Includes a margin of 25 percent for wastage.

**PRELIMINARY LIST OF CAMPESINO ASSOCIATIONS BY COMMUNITY
PARTICIPATING IN THE EXECUTION OF FORESTRY AND AGROFORESTRY
ACTIVITIES UNDER THE PROJECT**

<u>Sub-basin</u>	<u>Municipality</u>	<u>Community</u>	<u>Association</u>
Río Blanco	Chiantla	La Capellanía	Chiantla Militiamens Association
	Aguacatán	Los Alisos Lo de Chávez Los Cipreses	Reforestation Committee Reforestation Committee Reforestation Committee
Río Serchil	Malacatancito	La Cal Pucal Cieneguías Sarchil Malá	Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee
	San Bartolo Aguas Calientes	Chocanleu Palup Choquí	Agroforestry Committee Agroforestry Committee Agroforestry Committee
Río Pacaranat	Momostenango	Pancá Xequemeyá	Pro-Improvement Committee Pro-Improvement Committee
	Santa María Chiquimula	Xesaná Los Leones Xecachelaj El Rancho	Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee
	Santa Lucía la Reforma	Pamaria Chiquic	Reforestation Committee Agroforestry Committee
	Totonicapán	Pachoc Río Pasacola Las Trojadas Chomazán	Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee
Río Negro	Sacapulas	Río Blanco Pasaul	Reforestation Committee Reforestation Committee
	San Bartolomé Jocotenango	San Pedro Patzcamán Sajbalam	Pro-Improvement Committee Pro-Improvement Committee Pro-Improvement Committee
Chicruz	Cubulco	Piedra del Tigre	Pro-Improvement Committee
Salamá	San Jerónimo	San Jerónimo	Reforestation Committee
El Molino	Cunén	Río Blanco Los Trigales La Barranca	Reforestation Committee Reforestation Committee Reforestation Committee

ORGANIZATIONAL CHART FOR THE EXECUTING AGENCY



B. Execution coordinating unit (UNEPROCH)

1. Description of functions

UNEPROCH will be responsible for coordinating, administering, supervising, and conducting the monitoring and evaluation of the project. UNEPROCH's functions will include:

- a. meeting the terms stipulated in the loan contract signed with the Bank;
- b. managing the project's financial resources from the technical standpoint, having due regard for the laws and regulations of Guatemala and the terms stipulated in the loan contract;
- c. compiling and analyzing the information needed for the proper development of each of the project's components;
- d. preparing operational programs;
- e. planning, organizing, directing, executing, and monitoring the bidding processes necessary for execution of the work;
- f. preparing the documentation needed for executing the project's activities, subject to compliance with requirements deriving from signed contracts and/or agreements and applicable laws and provisions;
- g. selecting consulting firms and/or individual consultants to provide the technical assistance stipulated in the loan contract;
- h. contracting for the execution of the project's activities;
- i. supervising the execution and performance of signed contracts and agreements;
- j. establishing and maintaining relationships with other institutions, particularly the Inter-American Development Bank, the Ministry of Public Finance [Ministerio de Finanzas Públicas], the Central Bank of Guatemala, and with other national and international organizations, in accordance with the requirements of the project's activities;

- k. processing disbursements, preparing technical and financial reports for the project and others required by the IDB and the Government of the Republic of Guatemala;
- l. managing the administrative, financial, and legal aspects of project execution; and,
- m. establishing the records needed to keep consolidated accounts on the project.

2. Organization of the unit

1. The coordinating unit will have an Executive Directorate [Dirección Ejecutiva], which will have a Technical Committee [Comité Técnico] as a support/coordination unit. Operating under the Executive Directorate will be the Internal Auditing and Legal Advisory units and the Technical Directorate (the latter having its headquarters in Santa Cruz del Quiché).
2. The administrative/financial and programming/control units will provide liaison and support for the directorates.
3. For purposes of executing the various components, use will be made of three operational bureaus [Jefaturas] (agricultural, agroforestry, and forestry) supported by the Promotion Unit and the Technical Unit. The detailed organizational chart for UNEPROCH is included in Annex IV-2. The principal functions assigned to the authorities and units are specified in detail below.
4. The Minister of Agriculture, Stockbreeding, and Foodstuffs [Ministro de Agricultura, Ganadería y Alimentación] will be responsible for:
 - a. approving the annual work plan;
 - b. approving the draft operating budget for UNEPROCH and for the project's investments, subject to their submission to the Ministry of Public Finance;
 - c. providing coordination and support for participating entities both at the central and regional offices, and in the project execution area; and,
 - d. proposing to the President of the Republic the appointment of the project's Executive Director.
5. The Advisory Technical Committee [Comité Técnico Asesor] will consist of the executive director of the project, who will coordinate the committee; the Director General of Agricultural Services (DIGESA); the Director General of Forests and Wildlife (DIGEBOS); the Director General of Livestock Services (DIGESEPE);

the General Manager of the Agricultural Science and Technology Institute (ICTA); the Director General of Energy Planning and Development of the Ministry of Energy and Mines; the Works Manager of the National Electrification Authority (INDE); one representative from the National Environment Commission; and one representative from the National Watershed Management Commission.

6. The principal functions of the Technical Committee will be as follows:
 - a. advising the executive director on preparation of the work plan and preliminary draft budget for the project;
 - b. facilitating the participation of the entities which each of the committee members represents, both at the central and regional offices, and in the project execution area;
 - c. advising the executive director in specific technical areas and formulating proposals for the taking of technical, financial, and administrative decisions relevant to the project's execution; and,
 - d. advising the executive director in the preparation of the terms and conditions for bids, technical specifications, and terms of reference for the letting of contracts for the works, goods, and services needed to execute the project.
3. The project's human resources
7. The total personnel needed to execute the project are shown in the following table. The position totals are incremental.

<u>Distribution of personnel by component</u>			
<u>Component</u>	<u>Professionals and technical personnel</u>	<u>Administrative & general services</u> 1/	<u>Total</u>
1. Soil conservation and agricultural promotion	37	14	51
2. Forestry	19	42	61
3. Management of protected areas	1	5	6
4. Gully area rehabilitation	2	0	2
5. Technical Department, monitoring and evaluation	19	38	57
TOTAL	78	99	177

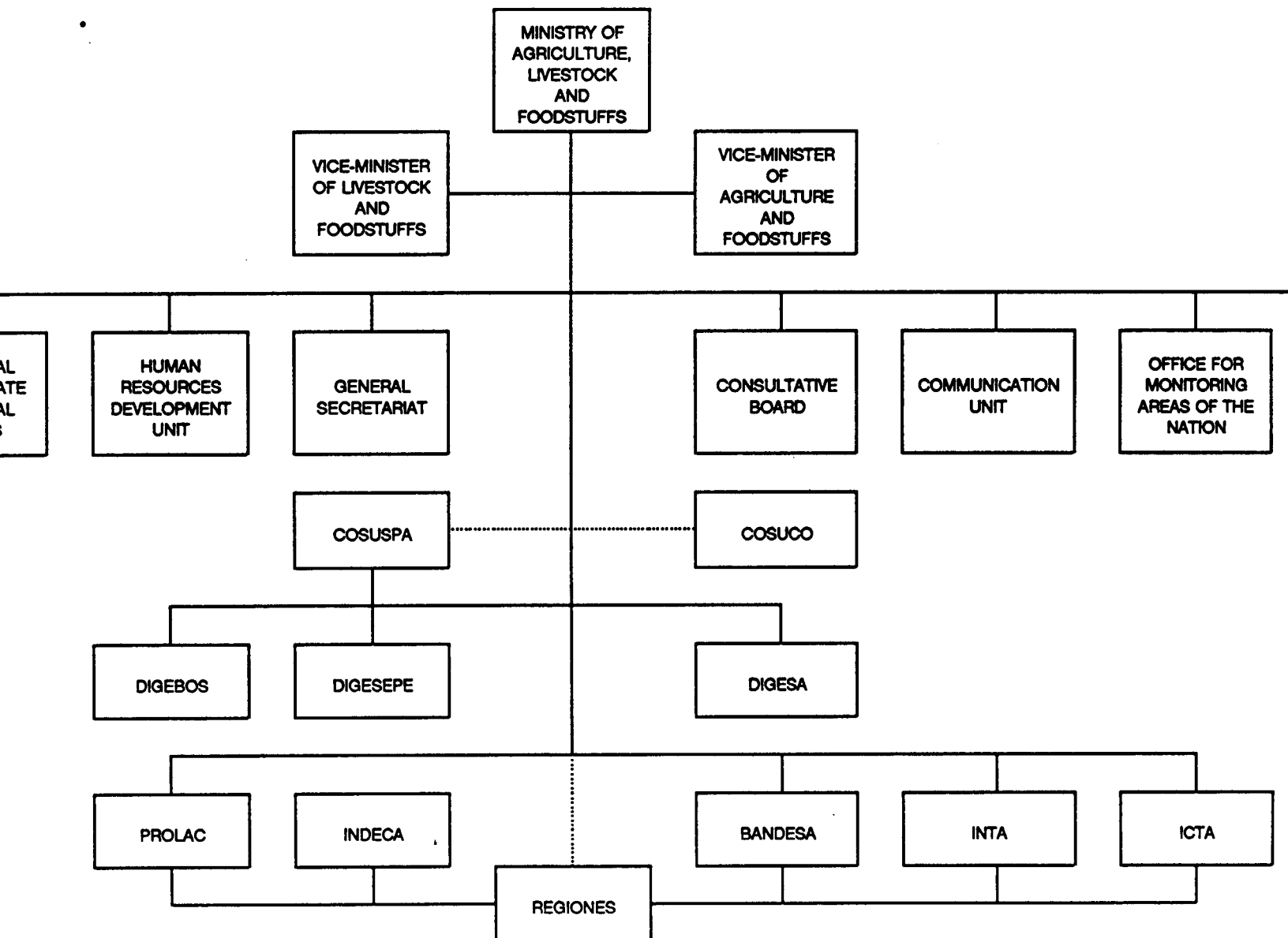
8. The professional, technical, and support personnel will be hired from the outset of the project, and the outreach officers will be hired depending upon the status of the goal attainment.
9. Also participating in addition to the staff will be 480 promoters for the soil conservation and agricultural promotion component and 100 agroforestry facilitators for the agroforestry extension component.

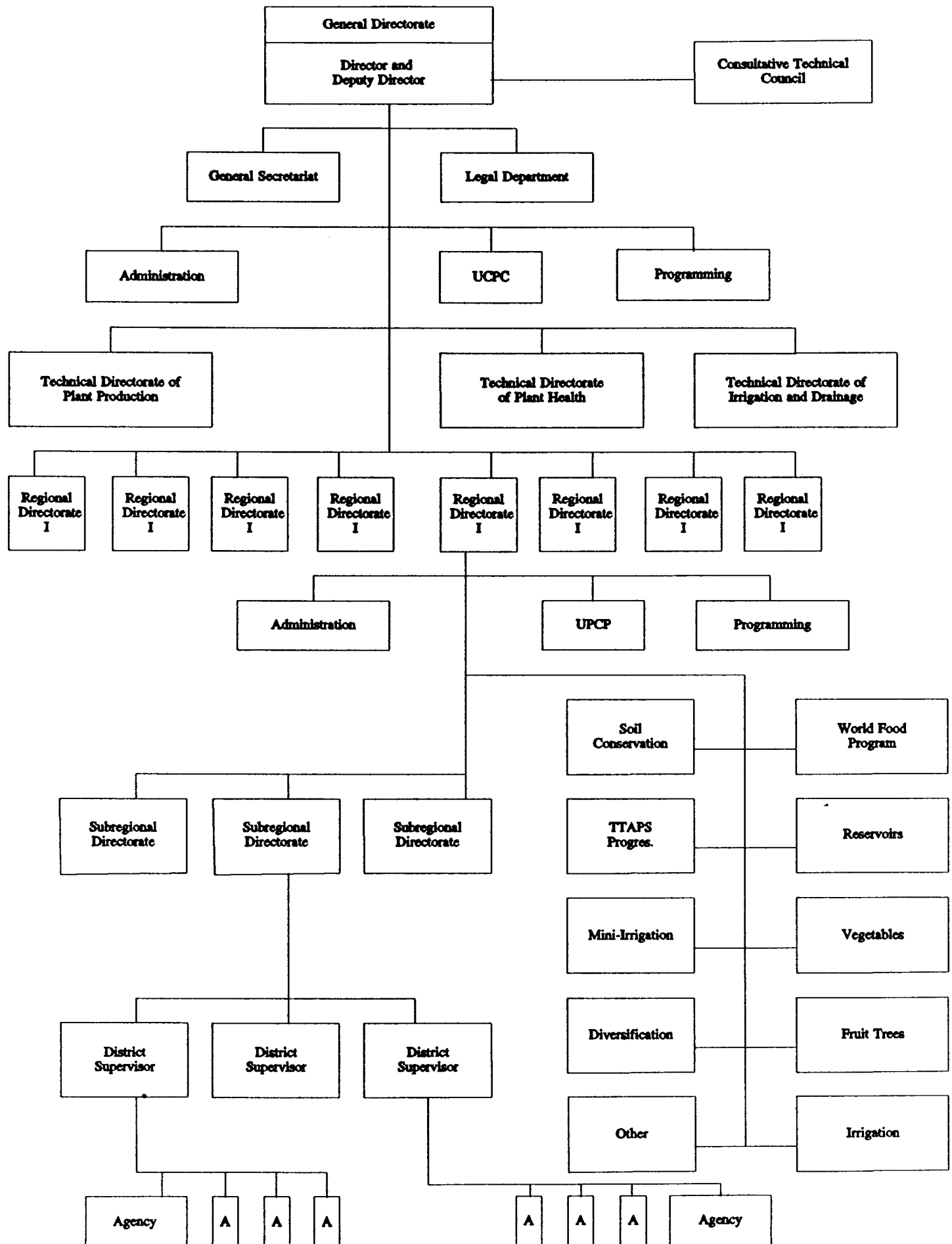
1/ Does not include the campesino leaders to be hired as outreach program facilitators or forest monitors.



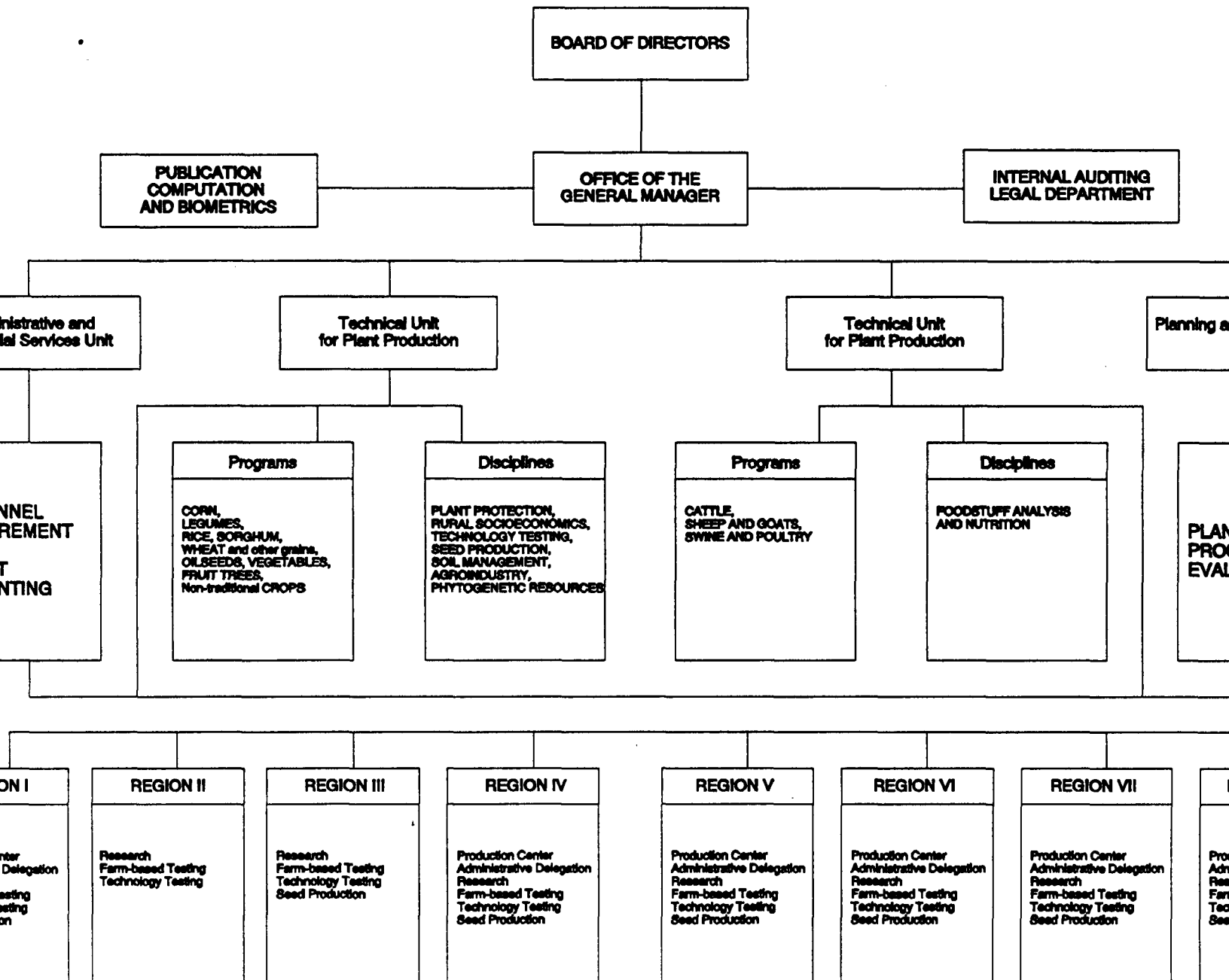
TABLE OF INDIVIDUAL CONSULTANTS			
Number	Specialty	Category	Time (months)
1	Information systems	I	2
2	Monitoring, Sp. sampling	I	2
3	Simulation models	I	2
4	Administrator protected areas	I	1
5	Nat. resource planner	N	6
6	Ecologist	N	6
7	Fish farming	N	3
8	Nat. resource economist	N	3
9	Rural sociology	N	3
10	Forestry management	N	3
11	Agroforestry systems	I	5
12	Forestry-Forest management	N	6
13	Fruit growing	N	4
14	Wood-saving stoves	N	1
15	Forest fires	I	5
16	Watershed management planner	I	12
17	Institutional development	I	24
18	Evaluation systems	I	6
19	Archaeologist	I	3
20	Chief archaeologist	N	36
21	Archaeologist (2)	N	72
22	Demographer	N	36
23	Stone expert	N	36
24	Restorer	N	36
25	Linguist	N	36
I International consultant N National consultant			

FUNCTIONAL ORGANIZATIONAL CHART OF THE MINISTRY OF AGRICULTURE, LIVESTOCK AND FOODSTUFFS

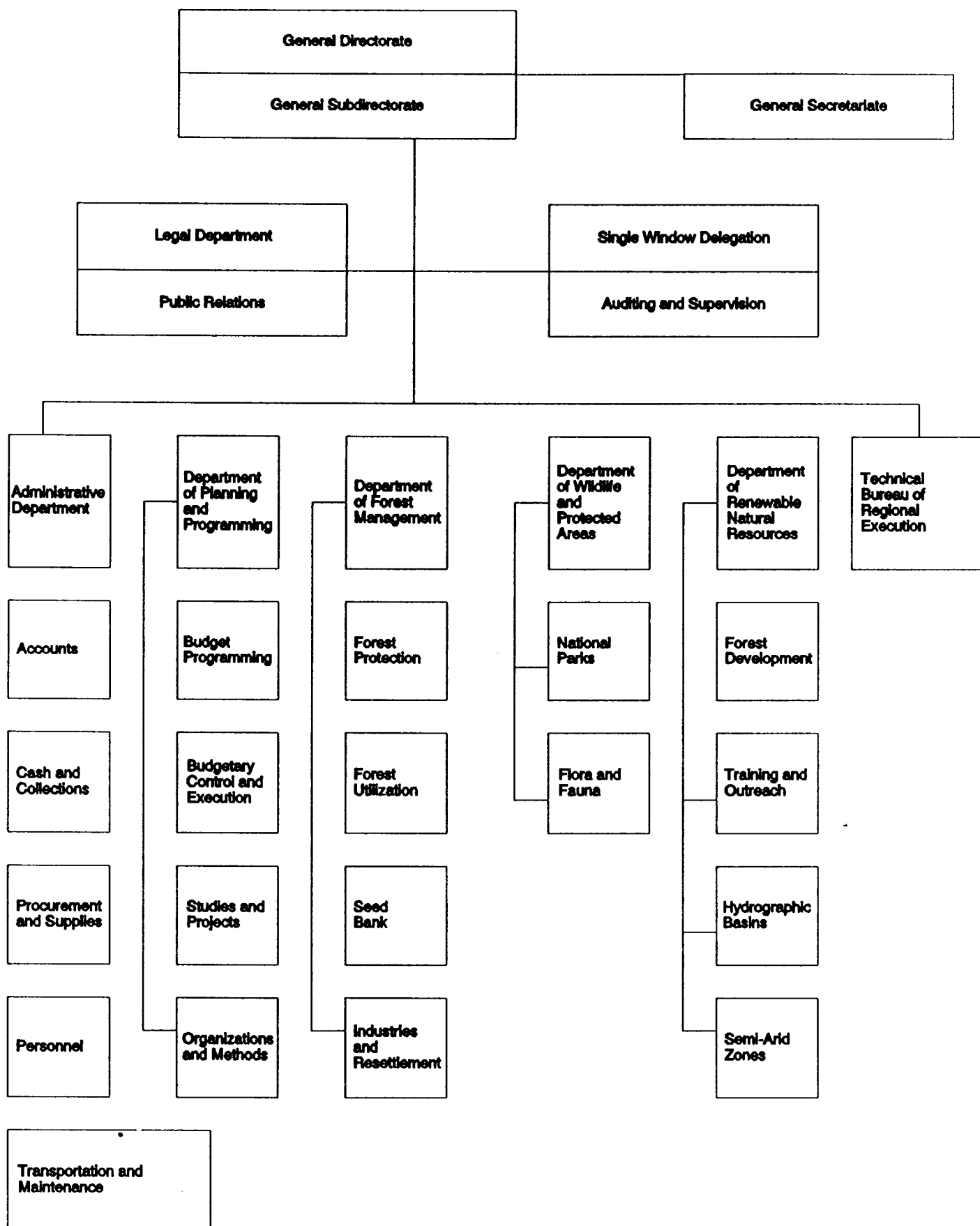




ORGANIZATIONAL CHART OF ICTA



ORGANIZATIONAL CHART FOR THE GENERAL DIRECTORATE OF FORESTS AND WILDLIFE



ECONOMIC EVALUATION

1. Introduction

The purpose of economic evaluation of a project is to supply sufficient data on the costs and benefits it is expected to generate, in order to be able to determine the advisability (or otherwise) of the proposed use of the resources requested. It is not, however, the only criterion.

The project's basic activities are intended to bring about a change in the rates of use and in forms of management of the basin's natural resources, and the benefits quantified or losses avoided are not purely the result of changes made to individual activities but are the end-result of all the activities taken as a whole. In this way, the appropriate management of the residual forests, bringing them up to a pattern of utilization that does not exceed their maximum sustained yield, will depend in large measure on concomitant changes in agricultural and fishery practices aimed at boosting production levels and expediting the diversification of agriculture and fisheries. One possible proposal aimed at generating higher incomes for the campesinos of the valley would diminish the pressure the campesinos impose on the forests in their quest to expand agricultural areas. At the same time, a more appropriate use of land intended for agriculture and livestock, coupled with topsoil maintenance, would decrease the rate of erosion and the gradual loss of land productivity and of the land's role in mitigating surface run-off. When soil erosion exceeds certain critical levels, it inflicts damage at the site of origin and downstream, and frequently causes severe external diseconomies, particularly in infrastructure and in the services which such infrastructure provides.

The establishment of area priorities, carried out at the project sizing stage, identified the subbasins and microbasins in which the project's benefits will accrue to the greatest degree. Particularly noteworthy in this respect are: (a) the (clean crop) agricultural zones where soil management and conservation are being promoted through the adoption of miscellaneous practices; and (b) the locations where the availability of the forest resource is the most important consideration. Also identified were special areas set aside for the protection of resources (forests and soils), and zones in an advanced state of degradation (throughout the basin) which are witnessing deep nonlaminar erosion likely to generate a substantial quantity of sediment and highly liable to suffer substantial losses in land values in the eroded plots.

2. Economic evaluation methodology

The project's activities were evaluated financially (at market prices) in order to analyze the feasibility of the proposed systems at the grass roots level, and estimates were carried out of the pertinent internal rates of return for each particular example and scenario (with and without the project). The economic evaluation was made at efficiency prices. The methodology used was based on the work of Little and Mirrlees with the modifications of Squire-Van Der Taak, better known as the LMST approach. Efficiency prices, otherwise known as frontier prices or shadow prices, make no distinction between a unit of income received by the government or by private individuals, nor do they correct the valuation of consumption for the level of income.

The computation model developed for the purpose makes the market evaluation at market prices and at efficiency prices for the 50 years of the projection period and incorporates a correction (in the without-project example) to reflect the long-term loss of productivity in agricultural and forest land, which will be explained in due course.

To calculate the shadow prices, use was made of product conversion factors which make it possible to move from market prices to shadow prices, all the while using the farm as a reference point. The specific conversion factors were applied to components of the costs of transportation and marketing, agricultural products and imported agrochemicals, inter alia. The standard conversion factor (SCF) - inverse of the shadow price of the foreign currency - converts to frontier prices the aggregates for goods and services of national origin. To correct the market price of (unskilled) labor, use was made of the correction factor, also known as shadow price of labor. As part of the calculation procedure, one obtains a breakdown of the value and price of the goods into: unskilled labor, foreign currencies, and taxes.

The estimated value for the SCF over the period from 1970 to 1985 was at all times higher than 0.95, which confirms the view that the Guatemalan economy has undergone a high degree of liberalization (it will be further liberalized with the planned reduction in export taxes by end-1990). For this reason, a standard conversion factor of 0.97 was adopted for the 50-year projection period. For the correction factor, the base coefficient or reference was 0.708. ^{1/} To organize the information in such a way as to simplify the evaluation process, the project's various production-

^{1/} (For further details concerning the evaluation methodology, the calculation of shadow prices, and the computation model, see: Chapter V, page 1-18 and annexes in the IDB/OAS Project Document Report).

related and investment-related activities were grouped together into four programs:

(i) An agroforestry program combining agricultural, fisheries, and agroforestry activities; (ii) a forestry program in the strict sense, encompassing the intensive and extensive management of forests and nursery-derived plantations; (iii) Natural Resources Protection Program, including the management of areas having a purely protective forest cover and the management of civil projects for the rehabilitation of gullying; (iv) Management, Monitoring, and Evaluation Program which will take the executing unit, the technical department, and other of the project's general support units. As the project will have an impact on electric power generation in the basin, this is computed under "Externalities." Monetary transfers between the government and the farmers or foresters will be recorded under "Transfers."

The model also makes it possible to construct the accounts for each group of interest parties taking part in the project: small-scale farmers (fewer than seven hectares), medium- and large-scale farmers (more than seven hectares), salaried workers, government, and the rest of society. In this way it is a straightforward matter to gauge the impact of the project on each group of beneficiaries.

For purposes of analyzing the present use of soil, technology levels, practices employed, observed and prospective yields, inputs and manpower used, other production costs, harvesting and marketing, use was made the best available sources, from the Ministry of Agriculture, DIGESA, and other official institutions, as well as sources of information derived from small projects executed by technical cooperation agencies under conditions similar to those of the project in question. A wide-ranging research project was also carried out at the grass roots level to achieve a characterization of "representative farms" by area, community, technological level, and type of campesino.

The need to revalue the project, brought about by the price changes that occurred between mid-1989 and 1990, gave the local technical team an opportunity to carry out a critical review of existing and proposed production systems, and precisely to identify those areas in which each type of activity and management system was to be carried out. In both cases, the team worked on the basis of representative farms by activity, type of campesino, and microbasin, and their results (costs and benefits per unit of area) were extrapolated to their universe. The component of forestry production for industry had to be left aside for economic and institutional reasons, given that the operations of the consortia have not yet been authorized. Accordingly, the only remaining beneficiaries are campesinos and small-scale producers.

3. Benefits and costs of the project: quantifiable and nonquantifiable

Quantifiable benefits are those connected with the productive activities estimated to be obtained as a result of the reforms of cultivation practices, both as regards the traditional crops in the Altiplano region, and in terms of the introduction of new ones; pastureland improvement and herd management, the introduction of agroforestry activities (agricultural and livestock microproduction in predominantly forest areas) and activities entailed by a more rational use of forests in terms of both intensive and extensive forestry. Accordingly, the benefits will stem from the increases associated with the gradual rise in agricultural and forestry production. One other quantifiable benefit, deriving from the conservation and management activities in the river valley, is measured to a partial extent on the basis of its contribution to the additional generation of energy.

So that the evaluation can make allowance for the impact of the gradual loss of productivity of the soils (due to erosion, overgrazing, and deforestation) in the "without project" scenario, two important corrections are made: (i) a slight and ongoing reduction in current yields and hence a reduction in annual net income, which (for the reasons given in section 5) is postulated to be linear between the commencement date of the project and the estimated year (average for all microbasins) in which the first soil horizon will cease to exist; (ii) a differential in the value of the land - in the terminal year of the evaluation period - to reflect the loss of capital due to nonconservation in the "without project" scenario. If one wishes to argue from another perspective, one can say that these two components are additional benefits attributable to soil conservation and to the protection of forest areas.

The above mentioned corrections are made at the end of the evaluation sequence, after calculating the "with project" and "without the project" scenarios. This also shows that those areas with the highest rates of erosion (for a similar configuration in the remaining parameters) in the without-project scenario, will have a smaller adjusted income. Accordingly, the net benefits of the project stemming from the WITH-WITHOUT comparison will be greater.

The costs of each activity and program include those costs directly borne by or attributable to producers and all the costs of the support and outreach subprograms intended for their benefit, including all operating and investment costs and the 10 percent contingency allowance. Given that the project execution period (via the loan) is six years and the project evaluation period is 50 years, it was considered that the operating and investment costs intended for supporting the services of the technical units, to be borne by the government, would continue for the entire useful life

of the project (with the exception of the civil works) albeit with decreasing intensity. 2/

To ensure the implementation of the production systems requiring the adoption of conservationist practices or more rational management, the project provides certain special cash incentives which have been described in other sections of this document. These are economic and financial costs for the project, but they constitute a transfer (subsidy) to the campesinos and other beneficiaries.

As mentioned earlier, in each program with income-generating productive activity, a distinction is made as to whether the activity in question is or is not carried out by a small-scale producer and as to whether the farm's output is wholly intended for the market or is self-consumed to some extent.

The following are some benefits that are not quantifiable, for want of sufficient data to corroborate their magnitude, given that they are determined by factors extraneous to the project or else because they have not been sufficiently well-investigated (problem of the cost and value of information:

- (a) Soil erosion and the consequent sedimentation not only causes damage to the land where the erosion originates and downstream, but also increases the costs of maintaining roads and highways, and irrigation or rainwater disposal channels. There is also an increase in the frequency and severity of floods in low-lying areas. With the sediments, one observes an appreciable increase in the associated transport of nutrients and pollutants, which combined with the greater turbidity serves to limit the productive or recreational/leisure capacity of the aquatic environment. There is also an increase in the cost of the water used for human and industrial consumption, in terms of both the present and future users of this source of supply.
- (b) When land suffers severe deterioration and are no longer able to sustain their rural occupants, it becomes derelict. This requires relocating the people involved, a process entailing high private and social costs. This is a risk well worth avoiding in a country as densely populated as Guatemala.

2/ The operating costs would remain level from year six through year 10, decreasing linearly to 30 percent of this value between year 10 and year 15, and continuing thereafter at that same level until the end of the evaluation period (50 years). The investments were estimated to be replenished every 10 years, and with each replenishment, the value charged to the project was reduced by 20 percent.

Neither scenario has been regarded as a quantifiable benefit in the evaluation.

- (c) The appropriate management of forest areas and protected zones not only has direct economic importance (which has been taken into consideration) but also has a beneficial impact on the water balance, the quality of the basin's water, the preservation of genetic resources, conservation of the habitat for wildlife, and the provision of other services and amenities for the population. Only a small portion of these benefits were taken into consideration.
- (d) The contribution made by the program of soil conservation and management and protection of areas in the upper and mid-Chixoy river valley, would be magnified if the mid-Chixoy multiple-use projects were carried out. This externality in respect of prevention (future costs avoided) could not be taken into consideration either, given that it is contingent upon decisions of another kind.
- (e) Minimal benefits were assigned to the reforestation subcomponent, equivalent to the on-farm commercial value of the 2.2 million plants to be distributed, and no benefit (except the externality) was assigned to the 1,100 hectares of reforestation with nurseries. Training is regarded as a necessity and has been computed as a cost, when part of it may be converted to investment. The same is true of forest and fire management.
- (f) The saving of wood due to the operation of the 6,000 Lorena stoves is quantifiable, but has not been included in the evaluation, in view of the fact that since the Lorena stoves allow for a lower consumption of wood in the amount of 5.7 cubic meters per family per year and have an (average) useful life of eight years, the saving in wood consumption over 14 years would be equivalent to 276,300 cubic meters. Its gross present value is 2.9 million quetzales. Its net present value, considering that the costs have already been charged to the project, is over 50 percent.

4. Subcomponents and activities not included among the costs

It is important to explain that the studies for the preparation of the Multiple-Use Management Plan [Plan de Manejo de Uso Múltiple] for the Cuchumatanes and the zone adjoining the reservoir were not included in the economic evaluation of the project. However, this is an important component of the long-term program from the standpoint of integrating the arrangements for managing the basin's resources.

Similarly, the basic studies for the reform and zoning of the basin, entailing the expansion of the meteorological and

hydrometric network (construction of seven climatological stations and five hydrographic stations) and the rest of the small-scale activities described in paragraph 3.25 have not been imputed to the cost of the project, because although a portion of their services will be used in the project, the bulk of the services will be used by MAGA and INDE and other major information users in the basin.

5. Special problems in making estimates

In projects of this complexity, special problems arise in terms of estimating benefits and/or damage avoided as a result of actions undertaken in the context of the project. This is true both in the main areas where the principal activities are to be carried out, and in sites distant from the basin itself, the effects of which could hold considerable economic and strategic implications for Guatemala.

One of the problems already alluded is linked to funding a practical solution to the problem of estimating the impact of soil erosion on the diminution of crop yields in the "without the project" scenario. It is obvious that the current yields (very low even for Guatemala) cannot be maintained. For this to occur, the campesino would have to effect modifications, use more fertilizers each year, or introduce other mechanical practices, quite apart from putting in more work himself. All of this would increase the campesino's production costs.

Theoretically, then, there are two alternative ways of approaching the problem. The first approach estimates the loss of yields and/or annual income which the producer will sustain if he does nothing to correct the effect of erosion. The second approach estimates the cost of replacing lost nutrients and the cost of the additional practices needed to maintain stable yields. The first alternative was chosen for purposes of this study.

In view of the fact that the project's agricultural intervention area comprises five subbasins and sixty-eight microbasins, more than 12,000 campesinos, with plots of land with differing gradients, depths, soil textures and degrees of vulnerability to erosion, it will be necessary to approximate the loss functions (of productivity) for each area and/or major configuration of the relationship between soil characteristics, soil standards, and climatic variables, under different techniques and packages for management of conservationist practices. Such know-how does not exist in Guatemala, not even at a simulated response level. It has therefore been necessary to adopt pragmatic criteria based on a very general underlying model.

Knowledge of human behavior, on the other hand, rests on the premise that the campesinos of the Altiplano region are well aware of the relationships between soil condition, crop type and impact,

and the effects of erosion, since they have spent centuries observing these phenomena and suffering their consequences. However, they have had neither the means nor the opportunity, let alone the specific technical know-how, to bring about the changes by themselves. In the main, they are "risk-avoiders" (in the economic sense of the term), and yet there is no way of compelling them to behave in precisely the same way as producers who are responsive to the values of a western capitalist culture. The campesinos' attachment to the land is very intense, as is their sense of survival. However, their plots of land are so tiny that they are reluctant, and not without reason, to experiment with new agricultural practices on their own land. Their reaction to the loss of natural fertility is to make themselves and their families work harder than ever. Although their land is deteriorating and they are forced to change crops, placing themselves in an inferior economic situation, it is not easy for them to abandon their land, which remains the place where they would prefer to live. Modeling these attributes and behaviors will require research that has not been conducted in Guatemala.

As far as physical relationships are concerned, similar case studies done in other countries indicate that the impact on productivity (yields) due to soil loss because of erosion is increasing over time. One likely outcome is to accept that the marginal productivity of the soil is inverse to the actual depth of the soil. One linearization of this relationship is an initial approximation, which will clearly underestimate the losses on the final stages of horizon A (especially when horizon B is superficial or nonexistent). For this reason a highly conservative hypothesis was adopted, in which the loss function is linearly decreasing between the project's zero year and the year n (80) in which the yield will drop to nil.

For the purposes of the evaluation, the farm models keep their "without project" yields at current levels (i.e., as though they were stable) and automatically incorporate the downward correction. The approach used here is therefore generalized and does not entail introducing changes in annual yields into each production system in those cases where far more data is required. The procedure is crude, approximate, but less manipulable and more straightforward than the alternative method. Tracking the project's activities may provide data that will prove exceedingly useful in terms of improving predictive capacity.

The reason why one includes a differential to reflect the value of the land (as a benefit of the project) is also clear. The value of one hectare of land, in the same location and used for productive purposes, will be very different in year 50 of the project depending on whether the land in question has or has not been conserved.

The second problem in terms of making estimates - a problem which has received considerable effort and attention - has to do with calculating the energy externality due to the decrease in the introduction of sediment into the Chixoy's useful reservoir, and with how these benefits are to be imputed to programs (components) that have very different behavior patterns over time. 3/ Sediment deposits in the useful reservoir adversely affect the equalizing capacity and hence the capacity to generate firm and secondary power. On the other hand, sediment deposits in the "dead reservoir" have a comparatively substantial positive "user cost". 4/

To estimate the benefits of erosion control in terms of additional generation of energy, scenarios with and without the project were simulated. For this purpose, estimates were made of the volume of sedimentation that would reach the reservoir under one or the other scenario. At the same time, a simulation was made of the generation and dispatch of firm and secondary power in Chixoy under various reservoir conditions. An approximation was obtained of the long-term marginal cost for the national interconnected system [sistema nacional interconectado (SNI)] in order to make a valuation of the power that would be lost if no project were carried out. 5/ Taking the figures for total sediments deposited in the reservoir in the "with project" and "without the project" scenarios and the height-volume ratios in the reservoir which these figures imply, it was possible to approximate the differential in firm and secondary power attributable to the project on a year-by-year basis and to calculate its value.

The attempt to obtain an annual prediction of the suspended sediments that would reach the reservoir through run-off from the entire basin and estimating what proportion of those sediments would be prevented by the project's actions is an exceedingly complex exercise and subject to a wide margin for error. There is even a lack of basic information on the movement and travel time of the sediments (from the upper and middle basin to the lower basin)

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- 3/ Preventing a million cubic meters from reaching the useful reservoir in year 5 of the project does not have the same value (in net present value terms) as doing so in year 50.
 - 4/ The forecast made by the designers of the Chixoy dam and the favorable topography of the reservoir vessel meant that the dead reservoir would achieve a capacity of 140 million cubic meters. However, this forecast (reduction of risks) must have cost a number of millions of dollars, invested over 10 years ago. This means that each cubic meter of the dead reservoir has an implicit cost the magnitude of which is equivalent to that of the user cost.
 - 5/ These were 6.2 cents per kilowatt hour of firm energy and 2.06 cents per kilowatt hour of secondary energy (this would appear to be an underestimate for a 50-year projection).

or on the characteristic time lag before which the project's actions are felt at the reservoir. Extraordinary climatic episodes, which may occur over the next 50 years, are very hard to predict. Efforts have accordingly been made to exercise caution in the calculations, which in any case are underestimates.

In addition, as we shall see in due course, the economic impact of these benefits (discounted value of the externality) is very low -- less than five percent of the project total. 6/ There are two reasons for this unexpected result. First, the existence of a sizable and as yet unfilled dead reservoir capacity, which will be offering its services for many years. Second, the well-known depressive effect of a discount rate of 12 percent per year, which will reduce to a minimum the value of the energy generated in the last 20 years of the project, at which time, paradoxically for Guatemala, the risk of breakdown and potential financial losses will be greater following the year 2020, in which the scarcity value or replacement value of this power will be very high. An evaluation in terms of kWh would yield less skewed information than the economic evaluation.

The establishment of soil conservation systems in 7,035 hectares of clean crops, the establishment of 1,550 hectares of agroforestry, the management of 51,000 hectares of forests (extensive, intensive, and plantations), the 18,000-hectare protected zone and the 1,000 hectares of gully rehabilitation, will diminish the inflow of suspended sediments by some 40.5 million cubic meters by year 50. Without the project, the total volume entering the reservoir would amount to 221.5 million cubic meters. With the project, the sediment inflow would be reduced to approximately 181 million cubic meters. By intervening in an area of 15 percent of the total size of the basin, the inflow of sediment into the reservoir is reduced by approximately 18 percent.

In terms of present value 7/ the physical distribution of the externality is as follows: (a) Management of forests and plantations 70.1%; (b) gully rehabilitation 18.4%; (c) agroforestry soil conservation 6.7%; and (d) protection zone by exclusion 4.8%. The

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- 6/ Doubling the price of the kWA doubles the value of the externality, but brings about no significant improvement in the relative share accounted for by these particular benefits in the total net benefits of the project.
- 7/ The expedient of applying the discount factor to physical magnitudes is fully valid as a criterion for apportioning the discounted total value for the externality among the components of the program. By multiplying the coefficient of relative distribution by the value of the additional energy generated one obtains the relative shares accounted for by each program or component in monetary terms.

effect of the gullying control drops dramatically by the end of the program and reaches zero shortly thereafter.

TABLE 1

Run without civil works and forest protection

<u>Program</u>	<u>Direct benefits</u>	<u>Total benefits</u>
Agroforestry programs	62,859,850	20,111,820
Soil conservation costs	-5,873,031	0
Agroforestry extension costs	-25,350,120	0
Forestry program	16,112,850	-1,190,126
Forestry extension costs	-11,850,490	0
Forest surveillance	0	72,268
Protected area plan	0	72,268
Civil works gully rehabilitation	0	72,268
Externality (energy)	722,680	0
Admin. and management costs (UE, DT, SE)	-17,383,240	0
TOTAL (sum control)	19,138,500	19,138,500
Net benefits market prices	-2,717,032	
Net benefits shadow prices	19,138,490	
Benefits salaried labor	5,280,520	
Benefits government	-51,575,370	
Benefits small farmers (1)	62,306,300	
Benefits large farmers (2)	0	
Benefits unassignable	3,127,107	
Sum (control)	19,138,520	

IRR IN MARKET PRICES (%): 11.70
IRR IN SHADOW PRICES (%): 14.49

TABLE 2

Base or reference case run: July - August 1990

<u>Program</u>	<u>Direct benefits</u>	<u>Total benefits</u>
Agroforestry programs	62,859,850	22,001,750
Soil conservation costs	-5,873,031	0
Agroforestry extension costs	-25,350,120	0
Forestry program	16,112,850	-299,181
Forestry extension costs	-11,850,490	0
Forest surveillance	0	72,268
Protected area plan	-1,387,966	-1,859,056
Civil works gully rehabilitation	-5,715,565	-7,880,814
Externality (energy)	722,680	0
Admin. and management costs (UE, DT, SE)	-17,383,240	0
TOTAL (sum control)	12,034,970	12,034,970
Net benefits market prices	-11,863,550	
Net benefits shadow prices	12,034,980	
Benefits salaried labor	7,054,165	
Benefits government	-60,521,000	
Benefits small farmers (1)	62,306,300	
Benefits large farmers (2)	0	
Benefits unassignable	3,195,538	
Sum (control)	12,034,990	

IRR IN MARKET PRICES (%): 10.74

IRR IN SHADOW PRICES (%): 13.43

PROPOSED RESOLUTION¹

GUATEMALA. LOAN /SF-GU TO THE REPUBLICA DE GUATEMALA
(Project for the Management and Conservation
of Renewable Natural Resources in the
Upper Watershed of the Chixoy River)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the República de Guatemala, as Borrower, for the purpose of granting it a loan to cooperate in the execution of a project for the management and conservation of renewable natural resources in the upper watershed of the Chixoy River, hereinafter the "Project". This Financing shall be subject substantially to the following conditions:

1. Amount and Currencies: Up to US\$14,400,000, or its equivalent in other currencies, except that of Guatemala, which are part of the Fund for Special Operations of the Bank, to pay for goods and services acquired through international competition in the member countries of the Bank and for such other purposes as may be specified in the loan contract. Payments of amortization and interest shall be made in the respective currencies disbursed.
2. Source of Funds: The Fund for Special Operations.
3. Guarantee: The general responsibility of the Borrower.
4. Credit Fee: 0.50% per annum on the undisbursed portion of the Financing, commencing to accrue twelve months from the date of this Resolution. The fee shall be paid in dollars of the United States of America on the same dates as the interest.

¹ The provisions contained in this Appendix I and in Appendices II and III shall be final only when the Board of Executive Directors has approved the loan proposal.

5. Amortization: The Borrower shall amortize the loan in a period of 40 years from the effective date of the loan contract, by means of 60 consecutive, semiannual and, insofar as possible, equal installments. The first installment shall be paid 10-1/2 years after the effective date of the loan contract.
6. Interest: 1% per annum during the first 10 years from the effective date of the loan contract and 2% per annum thereafter. Interest shall be payable semiannually on principal amounts outstanding, and the first payment shall be made 6 months from the effective date of the loan contract. At the request of the Borrower, the resources of the Financing may be used to pay interest during the period of disbursement thereof.
7. Disbursement: The term for disbursement of the Financing shall expire 6 years after the effective date of the loan contract.
8. Special Conditions:
 - (a) The Project shall be executed and the resources of the loan shall be utilized in their entirety by the Borrower, through the Ministerio de Agricultura, Ganadería y Alimentación, hereinafter referred to as the "Executing Agency", which shall act through the Executing Unit for the Project for the Management and Conservation of Renewable Natural Resources in the Upper Watershed of the Chixoy River, hereinafter referred to as "UNEPROCH". If modifications in the legal provisions or the basic regulations concerning the Executing Agency or UNEPROCH are approved which, in the opinion of the Bank, may substantially affect the Project, the Bank shall have the right to require the Borrower or the Executing Agency to provide explanatory and detailed information in order to determine whether such modification or modifications have or may have a substantially adverse impact on the execution of the Project. Only after receiving the requested information and clarifications, may the Bank take such measures as it deems appropriate, in accordance with provisions to be set forth in the loan contract.
 - (b) The resources of the loan shall be used to participate in the execution of a project estimated at the equivalent of US\$17,900,000. Consequently, the loan contract shall contain the appropriate provisions to ensure that such additional resources as may be necessary for the complete execution of the Project shall be duly provided, in addition to the loan, in an amount estimated in the equivalent of US\$3,500,000, in accordance with a schedule of investments satisfactory to the Bank.

- (c) Prior to the first disbursement of the Financing, the Borrower, through the Executing Agency, shall present to the satisfaction of the Bank:
- (i) evidence that it has: (1) created UNEPROCH in accordance with terms previously agreed upon with the Bank and appointed the Executive and Technical Directors of UNEPROCH, and (2) presented a schedule for the incorporation of the rest of UNEPROCH's staff and for contracting the individual consultants and non-governmental organizations identified in paragraph 6.01 of Appendix III;
 - (ii) evidence that the Executing Agency and the entities listed below, have signed, in accordance with the models previously approved by the Bank, the following agreements which shall establish, in addition to what is indicated below for each case, the corresponding mechanism for the use of Project resources in each of the respective entities: (1) with the Instituto Nacional de Electrificación, INDE, for the preparation of the baseline data for ordering and zoning the Upper Watershed of the Chixoy River; and (2) with the Instituto de Ciencia y Tecnología Agrícola, ICTA, for carrying out research, technology validation, and the monitoring and evaluation of the soil conservation and agricultural promotion component;
 - (iii) evidence that the Executing Agency has issued the Ministerial Agreements which shall establish the respective functions of the: (1) Dirección General de Bosque y Vida Silvestre, DIGEBOS, for the joint execution of the forestry component; and (2) Dirección General de Servicios Agrícolas, DIGESA, for the joint execution of the soil conservation and agricultural promotion component; and
 - (iv) a draft of the contract for the co-execution of the forestry extension and demonstration, agroforestry production and reforestation systems and improved stoves sub-components, and the short list for the selection and contracting of one or more nongovernmental organizations, "NGOs," to that end.
- (d) In the acquisition of machinery, equipment, and other goods related to the Project and in the awarding of construction contracts, the system of public bidding shall be followed in each case in which the value of such acquisitions or contracts exceeds the equivalent of US\$200,000. The bidding shall be subject to the procedures to be attached as an annex to the loan contract.
- (e) Notwithstanding the provisions of the aforementioned paragraph (d), the Borrower, through the Executing Agency, may use the resources of the Project:

- (i) up to the equivalent of US\$2,700,000, to contract directly labor from the participating Project communities, in order to carry out works to create agricultural and forestry demonstration plots, and to perform erosion prevention works; and
 - (ii) up to the equivalent of US\$2,300,000, to contract directly one or more NGOs to carry out forestry and agroforestry management extension and promotion activities.
- (e) The Bank shall establish such inspection procedures as it deems necessary to ensure the satisfactory development of the Project, and the Borrower shall extend all such cooperation as is required for the effective accomplishment of this purpose. From the Financing, the sum of US\$144,000 shall be credited to the accounts of the Bank to meet expenses of general inspection and supervision.

RECOMMENDATIONS

- A. It is recommended that the following conditions, to be fulfilled to the Bank's satisfaction, be included in the loan contract, in addition to those set forth in the proposed resolution:
1. Unless otherwise agreed by the parties, prior to issuing each call for public bids or, if public bidding should not be appropriate, prior to the procurement of goods or the initiation of construction works or Project works, the Borrower, through the Executing Agency, shall submit to the Bank:
 - (a) the general plans, specifications, budgets, and other documents necessary for the procurement or the construction, as applicable, specific bidding guidelines, and other documents required for the call to bids; and
 - (b) in the case of works, evidence of legal possession, easements, or other rights to the land required for the construction of the Project works.
 2. The Borrower, through the Executing Agency, shall:
 - (a) assure that the works and equipment involved in the Project will be adequately maintained in accordance with generally accepted technical standards; and
 - (b) present to the Bank, during the 10 years following completion of the first of the works of the Project and within the first quarter of each calendar year, the annual maintenance plan for the equipment and works of the Project for that year, as well as a report on their maintenance status, in accordance with the dispositions of Section VII of Appendix III. Should it be found, from inspections conducted by the Bank or reports received by it, that actual maintenance is below the agreed-upon levels, the Borrower and the Executing Agency shall take appropriate action to have the deficiencies fully corrected.
 3. The Borrower, through the Executing Agency, shall undertake to:
 - (a) within the period of 36 months from the effective date of the loan contract, present to the Bank an institutional plan that shall guarantee the continuity of the Project activities;
 - (b) within the period of 48 months from the effective date of the loan contract, present to the Bank evidence that it

has been taken the necessary measures to put into effect the proposed plan mentioned in the preceding subparagraph (a); and

- (c) take the necessary measures to ensure that, within the period of 10 years from the date of final disbursement of the Financing, it shall agree with the Bank on the minimum personnel necessary to provide for continuity of the activities foreseen in the soil conservation and agricultural, livestock and forestry promotion components.
4. The Borrower, through the Executing Agency, shall present evidence that it has contracted, within the periods established in the schedule referred to in Clause 8(c)(1)(2) of Appendix I:
- (a) the additional staff required by UNEPROCH for the proper execution of the Project; and
 - (b) in accordance with the terms of reference and procedures approved by the Bank, the individual consultants and nongovernmental organizations specified in paragraph 6.01 of Appendix III.

The Borrower, through the Executing Agency, may directly reach agreement for the services of ICTA, for the purpose of carrying out studies on soil fertility, run-off and erosion parcels and technology validation, up to the equivalent of US\$1,200,000.

5. The Borrower, through the Executing Agency, shall submit to the Bank, no later than November 30 of each calendar year during the execution of the Project, the Annual Operating Plan to be implemented in the following calendar year, based upon the guidelines set forth in paragraph 8.01 of Appendix III.
6. The Borrower, through the Executing Agency, shall submit to the Bank:
- (a) within the period of 12 months from the effective date of the loan contract, a report on the conditions existing at the beginning of the Project, which shall include a detailed description of the methodology to be used for the comparison of annual data, and an assessment of the impact of the activities associated with the different components of the Project;
 - (b) within the period of 24 months from the effective date of the loan contract, and annually thereafter until 36 months after the date of the final disbursement of the Financing:
 - (i) an update on: (1) socioeconomic information on the Project beneficiaries, and (2) progress made in the components relating to soil conservation and agricultural and livestock promotion, forestry, gully rehabilitation and management of protected areas; and (ii) data on

production, productivity, cost, and maintenance of the activities listed in subsection (i) of this paragraph; and

- (c) within the period of 36 months from the date of the final disbursement of the Financing, an ex-post evaluation report on the Project results, based upon the methodology referred to in paragraph 7(a) of this Appendix and in accordance with the guidelines established in paragraph 9.01 of Appendix III.
- 7. Between the thirtieth and the fifty-second months after the effective date of the loan contract, the Borrower, through the Executing Agency, shall carry out jointly with the Bank interim reviews of the Project, to examine the information requested in the reports specified in paragraph 6 of this Appendix corresponding to the first 24 and 36 months of Project execution, respectively, for the purpose of evaluating the status of Project execution and to propose changes and improvements that are necessary for the most satisfactory accomplishment of the basic objectives of the Project. To this end, the Borrower, through the Executing Agency, shall agree to implement any corrective action that may be proposed as a result of the above-mentioned review.
 - 8. The financial statements of the Project, during its execution, shall be submitted annually to the Bank, audited by an independent firm of public accountants acceptable to the Bank, and applying procedures satisfactory to the same. The financial statements shall contain a breakdown of the expenses and disbursements for each participating institution.
- B. The loan contract shall include an annex substantially similar in content to Appendix III (The Project), to this document.

THE PROJECT
(Annex A of the Loan Contract)

I. Objectives

- 1.01 The main objective of the Project is to contribute to the management of renewable natural resources and the development of the rural population living in the area of the upper watershed of the Chixoy River, by means of: (i) the establishment of systems to boost productivity and allow sustained use of the renewable natural resources utilized in agriculture, livestock and forestry activities; and (ii) the reduction of the present rates of deforestation, erosion and sedimentation, which adversely affect the utilization of the resources, the useful life of the Pueblo Viejo Dam, and other infrastructure works in the area.

II. Description

- 2.01 The Project consists of the following components:

- (a) Soil conservation and promotion of agriculture and livestock: This component consists of the execution, with the active participation of approximately 480 facilitators and 24 field supervisors, of works connected with soil conservation and sustainable agricultural practices in an area of approximately 7,035 hectares under hillside cultivation and the management and improvement of approximately 1,628 hectares of livestock pasture land. Also included is technical and management support in the form of training, by a specialized entity, in various aspects of agriculture and livestock, to be carried out by six agricultural extension agents, each of whom would be assigned to one of the six project operation centers. Approximately four livestock extension agents under the direction of an agrologist/zootechnician will provide instruction on livestock management;
- (b) Forestry and management of protected areas: This component consists of: (1) the management of forests, including the preparation of plans for the management of approximately 50,000 hectares of woodlands, in approximately 115 rural communities, the establishment of some 190 forest management demonstration plots, and providing training to the beneficiaries; (2) the establishment of agro-forestry production systems on approximately 1550 hectares for the purpose of generating sustainable income for about 3,100 small-farming families; (3) producing about 2.1 million plants for the reforestation of approximately 1,100 hectares by the communities and the distribution of about 6,000 units of

improved energy-efficient wood-burning stoves serving as demonstration models; (4) the establishment of a fire-protection system and a forest pest-control system and the control of woodlands use in an area of 146,000 hectares, including the construction and outfitting of approximately eight forest-fire observation towers; and (5) the management of protected areas, including the formulation of a plan for the management of the Cuchumatanes Multiple Use Reserve and the area adjacent to the Pueblo Viejo Reservoir and the conservation of woodlands and vegetation on approximately 18,000 hectares located in the direct drainage area of the Pueblo Viejo Dam;

- (c) Gully rehabilitation: This component consists of the rehabilitation, in distinct areas of the watershed, of approximately 1,000 hectares of eroded and unproductive areas, including the construction of small infrastructure works to reinforce the terrain affected by the process of erosion and to allow the regeneration of the natural vegetation; and
- (d) Investigation, follow-up, evaluation and research: this component consists of: (1) the establishment of a system of follow up and evaluation of the Project's impact; (2) the carrying out of activities and studies for the planning and zoning of the watershed area, as well as the construction of 7 meteorological stations and 5 stream-flow check points, outfitting the sediment-testing laboratory and training 2 experts in sediment technology; (3) studies on fertility, physicochemical and erosive classification of soils and soil erosion and the analysis of range management systems; and (4) prehispanic archeological exploration of the watershed area.

III. Total Project Cost

- 3.01 The total cost of the Project is estimated at the equivalent of US\$17,900,000, as itemized below by category and sources of financing:

**Project for the Management of the Chixoy
River Watershed**
(in thousands of US\$ equivalent)

Total per Fund

CATEGORIES	FSO	LOCAL	TOTAL	%
1. ENGINEERING & ADMINISTRATION	1340	1130	2470	13.8
1.1 ADMINISTRATION.....	292	1130	1422	7.9
1.2 SUPERVISION.....	1048	0	1048	5.9
2. DIRECT COSTS.....	9410	160	9570	53.5
2.1 CONSTRUCTION & IMPROVEMENTS	4940	0	4940	27.6
2.2 VEHICLES & EQUIPMENT.....	1020	0	1020	5.7
2.3 CONSULTING & TRAINING.....	1450	30	1480	8.3
2.4 STUDIES.....	2000	130	2130	11.9
3. CONCURRENT COSTS.....	370	1790	2160	12.1
3.1 SALARIES & PER DIEM	0	1650	1650	10.0
3.2 OPERATING EXPENSES.....	370	140	510	2.1
4. UN-ALLOCATED.....	2660	270	2930	16.4
4.1 CONTINGENCIES.....	1000	150	1150	6.4
4.2 COST ESCALATION.....	1660	120	1780	9.9
5. FINANCIAL COSTS.....	620	150	770	4.3
5.1 INTEREST.....	476	0	476	2.7
5.2 CREDIT FEE.....	0	150	150	0.8
5.3 ISF.....	144	0	144	0.8
TOTAL.....	14400	3500	17900	100.0
PERCENTAGE.....	80	20	100	

IV. Procurement and Contracting

- 4.01 (a) When goods and services to be procured or contracted are to be financed in whole or in part with resources of the Financing, the procedures and specific requirements for the invitation for bids or other form of purchase or contracting shall permit the unrestricted participation of goods and services,

including those related to any mode of transport, originating in member countries of the Bank. Consequently, no conditions that would either limit or restrict the supplying of goods or the participation of contractors originating in such countries may be imposed through such procedures and specific bidding requirements.

- (b) When sources of financing other than the local counterpart are used, the Borrower may arrange with such sources the procedure to be employed in respect of procurement and contracting. However, at the request of the Bank, the Borrower shall demonstrate the reasonableness of the price agreed to or paid for the purchase of goods, and of the financial terms and conditions established, and that the quality of the goods is in conformity with the technical requirements of the Project.

V. Consulting services

- 5.01 In selecting and contracting for consulting services to be financed either in whole or in part from the Financing, the procedures set forth in the loan contract shall be used, with the understanding that the Borrower may set no conditions or stipulations that may limit or preclude the participation of consultants from the member countries of the Bank.
- 5.02 When consulting services are to be financed using the local counterpart resources, the Borrower must submit to the Bank for approval, the names of the individual consultants or consulting firms selected, the terms of reference for their appointment, and the fees agreed upon.

VI. Individual consultants and nongovernmental organizations

- 6.01 The individual consultants referred to in clause 8(c)(i)(2) of Appendix I and paragraph 4 of Appendix II, shall include:
 - (i) an international expert to design and implement an information system;
 - (ii) an international expert to design and carry out studies and special samples for the annual evaluation system;
 - (iii) an international expert to construct the simulation model for natural resources in the upper watershed of the Chixoy River;
 - (iv) an international expert specializing in protected areas management;
 - (v) a national expert specializing in natural resources planning;
 - (vi) an ecologist from Guatemala;

- (vii) a national fish-farming expert;
- (viii) a Guatemalan economist, specializing in natural resources;
- (ix) a Guatemalan rural sociologist;
- (x) a Guatemalan forestry engineer;
- (xi) an international expert specializing in agro-forestry systems;
- (xii) a Guatemalan forestry engineer specializing in natural woodlands management;
- (xiii) one or more non-governmental organizations for the coexecution of the forest management and agro-forestry production subcomponents;
- (xiv) a Guatemalan linguist;
- (xv) a Guatemalan fruit-growing expert;
- (xvi) a Guatemalan expert specializing in fuel-efficient wood-burning stoves;
- (xvii) an international forest-fire protection expert;
- (xviii) an international expert in watershed planning and management;
- (xix) an international expert in institutional development;
- (xx) an international expert in evaluation and monitoring systems;
- (xxi) an international archeologist;
- (xxii) a Guatemalan chief archeologist;
- (xxiii) two Guatemalan archeologists;
- (xxiv) a Guatemalan demographer;
- (xxv) a Guatemalan stone expert; and
- (xxvi) a Guatemalan expert in restoration.

VII. Maintenance

- 7.01 The basic purpose of maintenance shall be to preserve the Project works in substantially the same condition as they were upon completion.

7.02 The first annual maintenance plan shall be for the fiscal year following the year in which the first Project works commence operation.

7.02 The annual maintenance report shall include:

- (a) a description of the department responsible, indicating the individuals responsible for maintenance, the type, condition, and the number of pieces of equipment to be used therefor;
- (b) the location, dimensions, and conditions of workshops, depots, and maintenance yards;
- (c) the amount available for maintenance in the current year's budget, and the budgetary appropriation to be allocated for maintenance in the following year; and
- (c) the conditions of maintenance, on the basis of a sufficiency evaluation system.

VIII. Annual plan of operations

8.01 Each Annual Plan of Operations referred to in paragraph 4 of Appendix II shall include:

- (a) an assessment of the extent to which the goals set in the Annual Plan of Operations for the previous year have been achieved based on the level of advancement of the Project works;
- (b) the goals, costs, and the institution responsible for performing the works associated with each component and sub-component of the Project;
- (c) the technical basis on which the Project activities will be coordinated for the sub-watershed and micro-watershed regions according to the priority that has been assigned each; and
- (d) the justification for the location and least-cost solution for the small civil works, the operating schedule of incentives designed to attain the goal of achieving the participation of producers, and the actions needed to ensure the necessary support services for production.

IX. Ex-post evaluation

9.01 To comply with the objectives of the Project evaluations referred to in paragraphs A.6(b) and (c) of Appendix II, at least the following aspects of each respective Project component shall be evaluated:

(a) Agriculture and livestock extension component:

- effectiveness in the selection of the facilitator and supervisors
- effectiveness of the training programs
- strength of the consulting services by farmer
- quality of the extension agent's message
- change in agricultural and livestock methods
- yield of principal crops
- areas in which soil conservation practices are in use
- use of natural and chemical fertilizers
- producer income and standard of living
- production costs and prices of principal products
- costs of carrying out Project activities
- reduction in the rate of soil loss per hectare;

(b) Forestry and reforestation management component:

- effectiveness in the selection of communities and farmers
- effectiveness of the training programs
- strength of the consulting services
- quality of the expert's message
- change in forest management techniques
- forest yield
- areas under management
- production costs and firewood and lumber prices
- reforestation types and coverage of each
- reduction in protected forests and vegetation
- change in the coverage and use of land
- preparation of management plans
- legal registration of protected areas
- regeneration of native flora and fauna;

(c) Gully rehabilitation component:

- number of small dams built
- length of live barriers
- length of dead barriers
- success in containing sediment; and

(d) Special studies:

- simulation of hydrologic and sedimentation models
- theoretical verification of economic analysis.
- specific indices that demonstrate the results reached in the achievement of the Project objectives, including sustainability.

ANNEX B
TENDER PROCEDURES

(Project for the Management and Conservation
of Renewable Natural Resources in the
Upper Watershed of the Chixoy River)

I. APPLICABILITY

A. Amount and Types of Entities

- 1.01 These procedures shall be used by the Executing Agency ^{1/} in all procurement of goods and contracting of construction and other services (except consultants' services) for the Program whenever the value of such goods or services exceeds the equivalent of two hundred thousand United States Dollars (US\$200,000) and provided such Agency is part of the public sector. Included in the public sector are corporations and other entities in which government participation exceeds 50 percent of their capital.
- 1.02 The Executing Agency may apply, in addition to the provisions of these procedures, formal requirements or procedural details prescribed under local law, when their application does not contravene basic bidding guarantees or relevant Bank policy. ^{2/}

II. GENERAL RULES

A. Public International Bidding

- 2.01 The system of public international bidding shall be used whenever the acquisition of goods or execution of services is to be partially or totally financed with foreign exchange from the Financing and its cost exceeds the equivalent of two hundred thousand United States Dollars (US\$200,000).

^{1/} For purposes of this procedure, the term Executing Agency may also refer to the Borrower whenever the latter is in charge of bidding.

^{2/} Because this procedure is uniformly employed by the borrowing countries, where bidding legislation varies from country to country in both form and detail, the rules and procedures established herein, set forth the general guidelines of the bidding process, its basic guarantees (such as publicity, equality, competition, formality, confidentiality, and free access) as well as the relevant policies of the Bank. For this reason, local laws may supplement the provisions of this procedure in regard to certain practices or procedural details, such as the membership of bidding boards or technical committees, formalities for registration of firms, periods for the award or evaluation of bids, formal requirements of the minutes of the meeting to publically open bids, and so forth.

- 2.02 When goods to be procured or services to be contracted are to be financed in whole or in part with foreign exchange from the Financing, the procedures and specific requirements for the bidding or other form of purchase or contracting shall permit the unrestricted participation of goods and services, including those related to any mode of transport, from member countries of the Bank. Consequently, no conditions that would limit or restrict the offer of goods or the participation of contractors from such countries may be imposed through such procedures or specific requirements.

B. Public Bidding that may be Restricted Locally

- 2.03 The acquisition of goods or execution of services to be totally or partially financed with local currency from the Financing, or with local counterpart funds whose total exceeds the equivalent of two hundred thousand United States Dollars (US\$200,000), shall be accomplished through public bidding which may be limited to the national economy.

C. Other Procedures for Execution of Services or Procurement of Goods

- 2.04 Whenever the procurement of goods or the execution of services is financed exclusively by resources other than those of the Financing or local counterpart funds ^{2/}, the Executing Agency may follow procedures agreed upon with the supplier of such resources, provided that such procedures are tailored to the technical requirements of the Program and guarantee that both the cost of the goods or services and the financial terms and conditions governing the resources are deemed reasonable by the Bank. The Bank may request that the Executing Agency provide it with information on the applicable procedure and the results obtained therefrom.

D. Procedures Applicable to Bids of US\$200,000 or Less

- 2.05 The procurement of goods or execution of services for amounts less than or equal to the equivalent of two hundred thousand United States Dollars (US\$200,000), shall be governed in principal by the provisions of local law. Insofar as possible, the Executing Agency shall establish procedures permitting the participation of several bidders and give appropriate consideration to economy, efficiency, and price. Whenever foreign exchange from the Financing is to be utilized, the procedures employed shall permit, in addition, the participation of bidders for goods and services from the Bank's member countries.

E. Participants and Eligible Goods

- 2.06 Goods and services to be procured for the Program that are to be financed by proceeds from the loan, must originate in the Bank's member countries. The following rules shall be followed in determining such origin:

^{2/} Such as commercial banks, suppliers, and other international financial institutions.

1. Bidding on Works

2.07 Only firms from the Bank's member countries may bid on works. To verify the nationality of the bidding firm, the Executing Agency must use the following criteria:

- (a) That the firm be incorporated or otherwise organized in an eligible country;
- (b) That the firm have its principal place of business located in an eligible country;
- (c) (i) That the firm be more than 50% beneficially owned by a firm or firms in one or more eligible countries (which firm or firms must also qualify as to nationality) and/or by citizens or bona fide residents of such eligible countries; and (ii) the firm be an integral part of the economy of the eligible country where located;
- (d) That there be no arrangement whereby any substantial part of the net profits or other tangible benefits of the firm will accrue or be paid to persons not citizens or bona fide residents of eligible countries; and
- (e) That not less than 80% of all persons who will perform services under the contract in the country where the construction is to be carried out, whether employed directly by the contractor or by a subcontractor, be citizens of an eligible country. For purposes of the computation, with respect to a firm from a country other than the site of the construction, citizens or permanent residents of the country where the construction is to be carried out will not be counted.

The foregoing criteria apply to each member of a joint venture or consortium (a collaborative effort of two or more firms) and to every firm which is proposed to subcontract part of the work.

The requirements set forth in this Section, must be communicated to interested parties, who shall provide the Executing Agency with the information necessary for verification of their nationalities on the prequalification, registration and bid forms.

2. Origin of Goods and Services

2.08 With respect to materials and/or equipment to be acquired, "origin" thereof, is the country in which the material and/or equipment has been mined, grown, or produced whether through manufacturing, processing or assembly. The origin of a "produced" article is necessarily the country in which, through manufacturing, processing or assembly, another commercially recognized article results which differs substantially in its

basic characteristics, purpose or utility from any of its imported components.

F. National and Regional Margins of Preference for Bidding on the Procurement of Goods

2.09 The Executing Agency may apply the following margins of preference in public international bidding on the procurement of goods.

1. National Margin of Preference

2.10 Where suppliers in the country of the Executing Agency participate in public bidding, such local suppliers of goods may be entitled to a national margin of preference which is provided to them, utilizing the following criteria:

- (a) Goods shall be considered to be of local origin if the cost of the local materials, labor and services used to produce the item constitutes not less than 40% of the cost of the finished product;
- (b) In comparing local and foreign offers, the bid or offered price of goods of local origin shall be the delivered price at the project site, with deductions for: (1) import duties paid on significant raw materials or manufactured components, and (2) local sales, consumption and value-added taxes incorporated in the cost of the item or items being offered. Proof of the amounts to be deducted under (1) and (2) shall be established by the local bidder. The foreign bid or offered price shall be the CIF price (excluding import duties, consular fees and port taxes) to which will be added port handling charges and any local transportation from the port or frontier to the project site;
- (c) The conversion of currencies to provide price comparisons shall be made on the basis of the conversion rate utilized by the Bank itself in its loan contracts; and
- (d) In adjudicating bids, a 15% margin of preference or the actual import duty, whichever is the lesser, may be added by the borrower to the CIF price of the foreign offers expressed in their local currency equivalent.

2. Regional Margin of Preference

- (a) For purposes of this Contract, the Bank recognizes the following regional or subregional integration agreements: (i) Central American Common Market; (ii) Caribbean Community; (iii) Cartagena Agreement, and (iv) Latin American Integration Association. If the country where the Executing Agency is located has signed more than one integration agreement, either the subregional margin of preference or the regional margin may apply depending on the country of origin of the article to be procured.

(b) Where suppliers of a country (other than the country of the Executing Agency) that is a party to an integration agreement, to which the country of the Executing Agency is also a party, participate in such bidding, such suppliers of goods are entitled to a regional margin of preference utilizing the following criteria:

- (i) Goods shall be considered to be of regional origin if they originate in countries that are parties to an integration agreement to which the borrower is also a party and comply with the standards governing origin and other matters relating to trade liberalization programmes established in the respective agreements;
- (ii) The local value added is not less than that stipulated for the national margin of preference; and
- (iii) In comparing foreign offers, the borrower may add to the price offered for goods originating in countries not parties to the respective integration agreement, either 15% or the difference between the import duty applicable to such goods when they originate in countries not parties to the integration agreement and that which is applicable to those goods when they originate in countries which are parties to the agreement, whichever is lower.

III. PUBLIC INTERNATIONAL BIDDING

A. Prequalification. Registration of Bidders

1. Applicability. General Rule

3.01 The Executing Agency shall use, in bidding conducted for the execution of works, a system of prequalification or registration of bidders in the case of large or complex civil works. In the case of contracts for smaller amounts, the Executing Agency and the Bank may agree to waive this requirement. The Executing Agency may also use this system in bidding conducted for the procurement of goods if deemed appropriate.

3.02 Prequalification Simultaneous With Bid: Two-Envelope Procedure

- (a) Unless prohibited by the laws of the respective country, the Bank and the Executing Agency may agree to a procedure of prequalification or registration simultaneous with the submission of bids whenever, in the judgment of the Executing Agency and the Bank, circumstances so dictate.
- (b) By means of this procedure, which must be clearly established in the bidding documents, every bidder shall submit, at the time the bids are opened, two envelopes containing the following:

Envelope 1 - information on the financial, legal and technical qualifications of the firms, such as: financial solvency, general and specific experience, key personnel and machinery available for the project, contracts fulfilled, ongoing contracts, current obligations and litigation.

Envelope 2 - the bid itself, with the respective price quotation.

- (c) At the opening of bids, which shall take place in a public ceremony at the set day and time, Envelopes No. 1 shall be opened and verified whether the bidders have included all documents required by the bidding specifications. If the envelopes do not contain the required documentation, the fact will be recorded in the minutes along with a description of the missing or incomplete information, and Envelope No. 2 shall be returned to the bidders unopened. Upon completing these procedures the first ceremony shall be adjourned, and Envelopes No. 2 of bidders that have presented all the required information shall remain sealed.

Based on the information presented in Envelope No. 1, prequalification of bidders shall take place within the periods set forth in the bidding documents to evaluate the financial, legal and technical capacity of the firms. Once the prequalification has been completed and approved by the Bank, the second public ceremony shall take place at the date, time and place set in the bidding documents. At this act, Envelopes No. 2 shall be returned unopened to the firms not prequalified. Once the representatives of the firms that did not prequalify have withdrawn, Envelopes No. 2 of the firms that did prequalify shall be opened, the price of each offer shall be read aloud, and a record of the prices and main points of the tenders shall be made in the minutes.

- (d) The final evaluation of the proposals and the award shall be made within the time period set forth in the bidding documents, and once the Bank has given its consent to the proceedings.

2. Registration of Bidders

- 3.03 No conditions that would impede or deter the participation of foreign companies or violate the principle of bidder equality shall be established in the procedures for registration or prequalification of bidders.

3. Term for Prequalification

- 3.04 The Executing Agency shall conclude the prequalification within a term compatible with the timetable of investments mutually agreed upon by the Executing Agency and the Bank.

4. Content and Publicity of the Invitation to Bid

a. Prior Approval of the Bidding Documents by the Bank

- 3.05 The bidding documents, including the public notices and bidder prequalification or registration forms, as the case may be, shall be mutually agreed upon by the Executing Agency and the Bank prior to the publication of the call for registration of prospective bidders. The bidding documents shall comply with the provisions of paragraph B.3 (Bidding Documents) herein.

b. Content of the Public Notice

- 3.06 The public notice of prequalification or registration of prospective bidders shall include, as a minimum, the following information:

- (a) General description of the Program and of the work which is the subject of the bidding, its site and its principal characteristics. In the case of bidding on materials, their description and distinguishing characteristics, if any;
- (b) the method proposed for prequalification;
- (c) approximate dates of the invitations to bid, opening of tenders, commencement of the services which are the subject of the bidding, and completion of construction;
- (d) the fact that the Program is being partially financed by the Bank and that the procurement of goods or contracting for services covered by said Financing shall be subject to the provisions of this Contract;
- (e) the place, time and date on which firms may obtain the prequalification or registration forms agreed upon by the Executing Agency and the Bank, as well as their cost; and
- (f) any other requirements to prequalify or participate in public bidding.

c. Publicity

- (a) Newspapers and Trade Journals. The public notice of prequalification or registration or the invitation to bid, when prequalification has not taken place, shall be published in at least one of the most widely circulated newspapers in the country on at least three separate occasions. There must be a space of at least three calendar days between each of the three public notices. In the case of bidding for works for amounts estimated to be above the equivalent of one million United States Dollars (US\$1,000,000) or for the acquisition of goods for amounts estimated to be above the equivalent of two hundred thousand United States Dollars (US\$200,000), the public notice of prequalification, registration and submission of

bids, when applicable, shall be published in two of the following publications:

- (a) well-known technical magazine;
 - (b) the United Nations' journal "Development Business";
 - (c) large circulation daily newspaper; or
 - (d) trade publication of wide international circulation.
- (b) Embassies. The Executing Agency shall deliver copies of the notices of prequalification, registration or submission of bids, as the case may be, to the embassies or, if there are none, to the consulates of each of the Bank's member countries on the same date they are delivered to the press for publication.

5. Content of the Prequalification or Registration Form

3.07 The prequalification or registration form, as the case may be, shall contain, inter alia, the following data:

- (a) Legal background on the creation, juridical nature and nationality of the bidding firm. A copy of the firm's by-laws and statutes shall be attached. The information on the nationality of the firm shall comply with Chapter II, paragraph E 2.07 herein ^{4/};
- (b) technical background of the firm;
- (c) financial condition of the firm;
- (d) available staff and equipment;
- (e) experience in the construction, manufacture and installation of goods or services similar to those which are the subject of the bidding;
- (f) work under way or present obligations assumed by the firm;
- (g) evidence that the firm has sufficient staff and equipment to satisfactorily carry out the services envisaged in the Program and an indication of where such staff and equipment are located; and
- (h) description, in broad terms, of how the firm would execute the services.

^{4/} In the rare instances when prequalification is conducted on bidding for the procurement of goods, the information to which reference is made in this subparagraph (a) must include information on the origin of the goods, rather than nationality of the firm, pursuant to Chapter II, E 2.08.

6. Deadline for Delivery of the Forms

- 3.08 Interested parties shall have at least 45 calendar days, from the final publication of the notice, to file prequalification or registration forms. This deadline may be reduced to 30 days when the bidding is restricted to a national context.

7. Selection of Prequalified Firms

a. Qualified Firms

- 3.09 Only those firms that have demonstrated the necessary technical, financial, legal, and administrative qualifications to carry out the services, in accordance with existing laws in the respective country and the norms established herein, may be prequalified or entered on the register of bidders. Documentation presented with material defects, omissions or evident errors may be accepted only if such defects, omissions or errors do not reflect upon questions of substance and, when corrected, do not alter the principle of equality among bidders.

b. Technical Report

- 3.10 The Executing Agency shall prepare a technical report on firms that filed for prequalification, indicating which were declared prequalified or duly qualified in the registry of projects and which were not, together with the grounds for such action. The report shall be sent to the Bank promptly for its approval or rejection.

c. Notification of Results

- 3.11 Once the Bank approves the technical report, all participating firms shall be notified of the results simultaneously.

d. Later Disqualification

- 3.12 Once prequalified, a firm may not be disqualified from bidding unless prequalification or registration was based on incorrect information filed by the firm or unless compelling circumstances that would justify such a decision occur after the date of prequalification or registration.

e. Duration of Eligibility

- 3.13 If one year has elapsed since prequalification or registration, and an invitation has not been issued, the Executing Agency shall issue a new call for prequalification or registration so that prospective new bidders may be admitted and those firms already prequalified or registered may update the information they provided originally. The new call shall meet the prerequisites established herein.

f. Absence of Prospective Bidders

- (a) If fewer than two prospective bidders were prequalified or registered in the first call, a second call shall be made, following the same procedure, unless the Bank authorizes private bidding on the terms set forth in the following subparagraph or authorizes the hiring of the sole successful bidder; and
- (b) if after the second call, two or more firms fail to qualify, the prequalification may be declared null and void, and with the prior approval of the Bank, private bidding may be conducted with at least three firms being invited to bid, including the firm prequalified previously if there was one.

3.14 Prequalification for Various Biddings

- (a) The Executing Agency may agree upon with the Bank to undertake one sole prequalification of contractors for various biddings when it is foreseen that, within a short period of time, it shall complete various biddings for the construction of a group of works of the same nature which, because of their geographic location or other factors acceptable to the Bank, can not be undertaken by means of one sole bidding.
- (b) Those contractors thereby prequalified may participate, if so established in the bidding requirements, in one or more of the programmed biddings. The Executing Agency may require, in each call for bids, that the bidders bring up to date all background which may have changed since the time of prequalification, as well as a demonstration that the executing capacity of each contractor continues to satisfy the standards established in the bidding requirements.

B. Bidding

1. Invitation to Bid

a. When prequalification took place

- 3.15 If prequalification has taken place, the Executing Agency shall send or deliver invitations to bid to only those firms that were prequalified. Prior to sending or delivering such invitations, the Executing Agency shall transmit to the Bank, for its approval, the text of the invitation to bid, together with the bidding documents if they were not transmitted earlier. At this stage, notices need not be published, and the embassies need not be advised as is stipulated in paragraph A 4(c) above.

b. Without Prequalification

- 3.16 In the absence of prequalification, the invitation to bid shall be publicized as set forth in paragraph A 4(c) herein. The bidding documents

shall clearly specify the minimum prerequisites which would qualify bidders to carry out the services or supply the goods involved. For this purpose, the documents shall include a questionnaire similar in content to the form specified in paragraph 3.07 of this Chapter, which is to be filled out by interested parties and delivered by them along with their respective offers.

2. Notices of the Call to Bid and Invitations to Bid

3.17 Calls to bid published in the press or invitations to bid delivered or forwarded to prequalified firms must specify, at a minimum, the following information:

- (a) Description of the Program, purpose of the bidding and source of funds to cover the cost of the procurement of goods or services;
- (b) the fact that the Program shall be partially financed by the Bank and that the procurement of goods or contracting of services payable from said Financing shall be subject to the provisions of the loan contract entered into with the Bank;
- (c) general description of the equipment, machinery and materials required, as well as of the services, the volume or quantity of work, its principal parts and deadline for its completion;
- (d) the office or place, date and time at which the bidding documents, including the bidding guidelines, plans, specifications, and draft contracts may be obtained;
- (e) the office where the bids are to be delivered and the authority responsible for their approval and award; and
- (f) the place, date and time at which the bids will be opened in the presence of the bidders or their representatives.

3. Bidding Documents

a. Bank Approval

3.18 The bidding documents, including inter alia instructions to bidders, conditions of contract, schedule of requirements/bill of quantity, technical specifications, if any, bid form, contract form and security formats, shall be approved by the Bank prior to their release to interested parties.

b. Clarity of the Documents

3.19 The borrower should ensure that the bidding documents are coherent and comprehensive. Particular care must be taken to ensure that the goods and services to be supplied are described with sufficient clarity and in

sufficient detail to form the base for competitive bids. The cost of such documents must be reasonable.

c. Free Access to the Executing Agency

- 3.20 The Executing Agency shall be available, once the bidding documents have been collected by bidders and up to the time the bids are opened, to answer questions or clarify the bid documents for bidders. These inquiries shall be answered promptly by the Executing Agency, and clarifications, if any, made available to the other interested parties and the Bank.

d. Standards of Quality

- 3.21 If particular standards with which equipment or materials must comply are cited, the specifications should state that goods meeting other authoritative standards, which ensure an equal or higher quality than the standards mentioned, will also be accepted.

e. Specifications for Equipment: Brand Names

- 3.22 Descriptions contained in specifications should not prescribe brand names, catalogue numbers, or types of equipment of a specific manufacturer unless it has been determined that this is necessary to ensure inclusion of certain essential design, performance or construction features. In such a case, the reference should be followed by the words "or equivalent," and a measure to determine the "equivalence" included. The specifications should permit offers of alternate equipment, articles or materials which have similar characteristics and provide equal performance and quality to those specified. In special cases, with previous approval of the Bank, specifications may require that a proprietary item be supplied.

f. Currency Clause

- 3.23 The bidding documents should state the currency or currencies to be used in payment, taking into account the provisions of this Contract. Whenever expenditures in both local currency and foreign currency are involved, the bidding documents should require that the documents of these expenditures be detailed separately.

g. Bid Bonds

- 3.24 Bid bonds or other tender guarantees should not be set so high ^{2/} or their validity stretched out over long periods, as to discourage suitable bidders from tendering. In addition, bid bonds shall be returned:
- (a) to the winning party once the contract is executed;
 - (b) to the second- and third-place bidders, within a term of no more than three months from the date of the award or upon execution of the contract, if the latter occurs prior to such deadline. Nevertheless, if such bidders indicate lack of interest, the bond shall be returned within five days following the award;
 - (c) to other bidders within five days following the award.

h. Performance Guarantees

- 3.25 Specifications for construction works should require performance bonds or other surety to guarantee that the work will be carried on to completion. Even though the amount of the bond will vary with the type and magnitude of the work, it should be defined in the bidding documents and be sufficient to afford the borrower adequate protection. The amount of the bond should be sufficient to ensure completion of the work, at no increase in expense to the Executing Agency, in case of default by the contractor in the performance of the work. The life of the bond or surety should extend sufficiently beyond completion of the contract to cover a reasonable warranty period. If necessary, performance bonds or sureties may be required in connection with contracts for supply of equipment, although in such cases the bidding documents should provide, if possible, that a percentage of the total payment be held as retention money to guarantee performance.

4. Deadlines for Submission of Bids

a. Normal Term

- 3.26 The normal deadline for filing offers in international public bidding shall be not less than 45 calendar days from the date of the invitation to bid or the date of availability of bidding documents, whichever is later.

^{2/} Some bidding practices limit the amount of the bid bonds (tender guarantees) to 1 percent of the price of the contract. Others recommend that the Executing Agency set a fixed amount in cash for all bidders instead of requiring the bidder to base his guarantee on a given percentage of the value of his bid. This is to avoid undue publicity of the price of each tender prior to the opening of the bids, should the amount of the guarantee or bid bond become public knowledge.

b. Term for Large Civil Works

- 3.27 Where large civil works are involved, a minimum of 90 calendar days shall be allowed for contractors to conduct technical, labor availability, and any other investigations at the site.

c. Deadline for Filing of Domestic Bids

- 3.28 When the bidding is limited to the national economy, the Executing Agency may reduce the deadline for filing offers to a period of up to 30 calendar days.

5. Confidentiality of Bid and Prequalification Documents

- 3.29 The officers in charge of receiving the envelopes containing prequalification or registration forms or tenders, shall verify that such envelopes are delivered by the tenderer properly sealed. These envelopes shall be kept in a safe place until opened and recorded. Once opened, no copies shall be taken of these documents, and other suitable measures should be envisaged to ensure that their contents are not divulged to persons other than those officially responsible for their examination. Except as may be required by law, no information relating to the examination, tabulation, clarification and evaluation of bids and recommendations concerning awards, should be communicated to any person or persons not officially concerned with the procedures, after the public opening of bids and before the announcement of the award of contract to the successful bidder.

6. Modification or Extension of the Bidding Documents

- 3.30 Any modification or extension of the bidding guidelines, specifications, or the filing date must first be approved by the Bank and communicated to all interested parties who are in possession of the bidding documents. In the event that such modification or extension is substantial, in the opinion of the Executing Agency, or the Bank, there must be an interval of at least 30 calendar days between the date of notice to interested parties and the date bids are opened.

7. Consultations should not Modify the Bidding Documents

- 3.31 Consultations on the interpretation of bidding documents addressed to the Executing Agency by interested parties may not be used to modify or expand the bidding guidelines and specifications. Consultations and replies thereto shall in no case cause a suspension of the term for presentation of bids.

8. Single Bid

- 3.32 When only a single bid is received in response to an invitation to bid, the Executing Agency may not award the contract without the prior consent of the Bank.

9. Opening of Bids

- 3.33 Offers shall be submitted in writing in sealed envelopes. They must be signed by the legal representatives of the bidders and comply with the prerequisites set forth in the bidding documents. They shall be opened in public on the scheduled date and hour. Representatives of the bidders and of the Bank may attend the bid opening and shall be entitled to inspect the bids. Bids received after the filing date shall be returned unopened. The names of the bidders, the price of each bid, the term and amount of guarantees, and any substantial change submitted separately, before the deadline but after the principal bid is submitted, shall be read aloud. All of the above shall be recorded in the proceedings, which shall be signed by the representative of the Executive Agency and by any bidders present who wish to do so.

10. Clarification of Bids

- 3.34 The Executing Agency may request clarifications from the bidders with respect to their tenders. Clarifications requested or given shall not alter the essence of the offer or its price, nor shall they violate the principle of bidder equality.

11. Analysis and Comparison of Bids

a. Purpose

- 3.35 Bids shall be analyzed and evaluated to determine whether they comply with the terms and conditions stipulated in the bidding documents, and the value of each bid shall be fixed for the purpose of awarding the winning bid.

b. Lowest Evaluated Bid

- 3.36 In addition to the bid price, adjusted to correct arithmetical errors, the Executing Agency may also consider other relevant factors in determining the low bid:
- (a) These factors preferably should be expressed in monetary terms or, as a minimum, given a relative weight according to criteria specified in the bidding documents. No criteria may be used in bid evaluation that are not set forth in the bidding documents. The amount of escalation for price adjustments, if any, included in the bids, should not normally be taken into consideration; and
 - (b) The currency or currencies in which the price offered in each bid would be paid by the Execing Agency if that bid were accepted, should be valued in terms of a single currency selected by the Executing Agency for comparison of all bids and stated in the bidding documents. The rates of exchange to be used in such valuation should be the selling rates published by an official source, and applicable to similar transactions on the day bids are opened or at such later

date (30 or 60 days after bid opening) as shall be specified in the call for bids.

c. Rejection of Bids

- 3.37 Bidding documents should provide that the Executing Agency may reject all bids where no bids meets the intent of the specifications, or where there is evidence of lack of competition and/or collusion. The Executing Agency may, after consultation with the Bank, reject all bids if the low bids exceed the official estimate by an amount sufficient to provide reasonable justification for such action. In such cases, new bids should be requested from at least all who were invited to submit bids in the first instance and a reasonable amount of time should be allowed for the submission of the new bids. In the absence of a 100 percent performance bond, individual bids may be rejected in cases where the particular bid is so much lower than the official estimate, that it is reasonable to conclude that the bidder will not be able to complete the works or supply the product, within the specified time at the price offered.

12. Bid Evaluation Report

- 3.38 The Executing Agency shall prepare a detailed report on the analysis and comparison of bids, describing precisely the reasons for selection of the lowest evaluated bid. The report, as approved by the Executing Agency, shall be submitted to the Bank for consideration prior to the contract award. If the Bank determines that the proposed award is not consistent with the terms of this Contract, it will promptly inform the Executing Agency of its determination and state the reasons therefore, and the contract will not be eligible for financing by the Bank. The Bank may cancel an amount of the Financing which, in the Bank's reasonable opinion, represents the amount of such ineligible expenditures.

13. Award of Contract

a. Bank Approval

- 3.39 The award shall be made to the bidder whose responsive bid has been determined to be the lowest evaluated bid, once the Bank has approved the corresponding notice of award.

b. Notification of Award and Signature of the Contract

- 3.40 The Executing Agency shall promptly notify all bidders of the award, at the addresses they have provided. It shall promptly send to the Bank, for its approval, a draft copy of the contract for signature by the winning bidder. The contract to be signed shall not modify the winning bid or the terms and conditions stipulated in the bidding documents. Once the Bank approves the draft contract, it shall be signed. The Executing Agency shall promptly send a copy of the signed contract to the Bank.

14. Modification of the Award

- 3.41 If for any reason the winning bidder does not sign the contract within the period set for that purpose, the Executing Agency may award it, without a new invitation to bid, to the next lowest responsive bidder.

15. Bidding Declared Null and Void

a. Report to the Bank

- 3.42 Whenever the Executing Agency has reasonable grounds for declaring the bidding null and void, it shall request prior approval of the Bank for such action by sending it a complete report including the reasons and grounds for proposing such a measure.

b. Effects of the Declaration

- 3.43 Once the bidding is declared null and void, the Executing Agency shall issue a second invitation to bid following the provisions set forth in these procedures. If the second bidding is declared null and void, the Executing Agency and the Bank shall agree on the procedure to be followed for the procurement involved.

IV. DUE PROCESS

- 4.01 Local regulations applicable to bidding under these Procedures must guarantee the legal protection of bidders, establishing the proper review remedies to guarantee such protection.
- 4.02 The Executing Agency shall not impose conditions which would impede, restrict or increase the cost of submitting protests by participating firms, under bidding for goods or works with resources from the Program.
- 4.03 The Executing Agency shall notify the Bank promptly of any protest or claim lodged in writing by the participating firms and of any responses to such protests or claims.

V. NONOBSERVANCE OF THIS PROCEDURE

- 5.01 The Bank reserves the right not to finance any award in which, in its opinion, there has been noncompliance with the provisions set forth in these procedures.

ANNEX C

SELECTION AND CONTRACTING OF CONSULTING
FIRMS AND/OR INDIVIDUAL EXPERTS

In the selection and contracting of consulting firms, specialized institutions and/or individual experts (hereinafter referred to without distinction as "Consultants") necessary for the execution of the (Project) (Programme), the following shall be applicable:

I. DEFINITIONS

The following definitions are established:

- 1.01 A consulting firm is any legally constituted association, composed primarily of professional personnel, for the purpose of offering consulting services, technical advice, expert opinions, and professional services of other kinds.
- 1.02 A specialized institution is a non-profit organization such as a university, foundation, autonomous or semiautonomous organization or an international organization which offer consulting services. For the purpose of this Annex, the same rules shall apply to specialized institutions as to consulting firms.
- 1.03 An individual expert is any professional or technician specialized in some form of science, art or craft.
- 1.04 A Beneficiary is any recipient of a subloan or credit made with the resources of the Programme. 1/
- 1.05 An intermediary financial institution (hereinafter referred to as "IFI") is a credit institution which, in certain global loans granted by the Bank, relends the resources of the Programme. 2/

II. CONFLICTS OF INTEREST

- 2.01 The resources of the Bank shall not be used to contract Consultants from the country of the Borrower if: (i) they are part of the regular or temporary staff of the State or of the institution which receives the Financing 2/, or if such institutions are to be the beneficiaries of the services to be provided by the experts; or (ii) they have pertained to such entities within the six months prior to one of the following dates: (a) that of the presentation of the application; or (b) that of the

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- 1/ This section shall be included only in operations in which beneficiaries or IFI are to contract the Consultants directly.
 - 2/ In Technical Cooperation Agreements, the appropriate term shall be used (Contribution, Credit, etc.)

selection of the individual expert, unless the Bank agrees to reduce that period.

- 2.02 A fully-qualified professional services firm which is a subsidiary or affiliate of a construction contractor, equipment supplier or holding company normally will be considered acceptable only if it agrees in writing to limit its role to the provision of professional consulting services and agrees in the contract to disqualify itself and its associates from any construction work, material or equipment supply or financial participation in the same (Programme) (Project).

III. ELIGIBILITY AND NATIONALITY REQUIREMENTS

- 3.01 The (Borrower) 3/ (Executing Agency) (IFI) (Beneficiary) shall not establish in the implementation of the procedures set forth in this Annex, provisions or conditions which may restrict or impede the participation of Consultants from member countries of the Bank.
- 3.02 Only Consultants who are nationals of countries that are members of the Bank may be contracted. To determine the nationality of a consulting firm the following criteria shall be considered:
- (a) The country in which the firm is duly established or legally organized.
 - (b) The country in which the firm maintains its principal place of business.
 - (c) The nationality of any firms or the citizenship or the bona fide residency of individuals possessing ownership, with the right to participate in profits, of more than 50% of the consulting firm, as established by the certification of a duly authorized officer of such firm.
 - (d) The existence of arrangements whereby a substantial portion of the profits or other tangible benefits of the firm accrues to firms or individuals of a given nationality.
 - (e) A determination by the Bank that the firm constitutes an integral part of the economy of a country, as evidenced by bona fide residency in the country of a substantial portion of the executive, professional and technical personnel of the firm, and that the firm has available in the country the operating equipment or other elements necessary to provide the services to be contracted.
- 3.03 The nationality requirements established by the Bank shall also be applicable to firms proposed to provide part of the respective services in joint venture with or under sub-contract to a qualified consulting firm which itself meets the nationality requirements.
- 3.04 The nationality of an individual expert shall be established by means of the individual's passport or other official document of identity. The

3/ In Technical Cooperation Agreements, the appropriate term shall be used ("Beneficiary", etc.)

Bank, however, may allow exceptions to this rule in those cases in which the individual expert, not being eligible by reason of nationality: (i) has established his domicile in an eligible country, is legally entitled to work there (as other than an international civil servant) and has no known intention of returning to his country of origin in the immediate future; or (ii) has established permanent domicile in an eligible country and has resided therein for at least five years.

IV. PROFESSIONAL QUALIFICATIONS

- 4.01 An analysis of the professional qualifications of a consulting firm for a specific project will take cognizance of the firm's: (i) experience and that of its principals in providing successful consulting services for projects of a comparable size, complexity and technical specialty as those of the task involved; (ii) assigned number of professionally qualified personnel; (iii) previous experience in the region and in foreign areas; (iv) language capability; (v) financial capacity; (vi) present work load; (vii) ability to organize sufficient personnel to do the work within the required time; (viii) high ethical and professional reputation, and (ix) position being completely free from any potential conflict of interest.

V. PROCEDURES FOR SELECTION AND CONTRACTING

A. Selection and Contracting of Consulting Firms

- 5.01 In the selection and contracting of consulting firms:

((a) Prior to the selection of the firm, the (Borrower) (Executing Agency) shall submit the following for the agreement of the Bank:) 4/

((a) Prior to the selection of the firm, the (IFI) (Beneficiary) (Executing Agency) shall submit the following for the approval of the (Borrower) (Executing Agency) (Beneficiary), which in turn shall require the agreement of the Bank:) 5/

- (i) The procedure to be used in the selection and contracting of the firm, including:

(A) the role of the Executing Agency Staff or the Selection Committee designated to:

1. review and approve documents;
2. select a short list of firms;
3. determine the order of merit of the short listed firms; and
4. approve the firm finally selected.

4/ This alternative shall be used when the Borrower or the Executing Agency will directly contract the consulting firm.

5/ This alternative shall be used when the intermediary agency or Beneficiary will contract the consulting firm.

The entity contracting the Consultants shall furnish the Bank with the names and positions of the people it chooses to participate in the preselection and selection processes.

- (B) the specific points system to be used in preselecting the firms. This system shall include, as a minimum, the following aspects:
 - 1. general background of the firm;
 - 2. similar work done;
 - 3. prior experience in the country where services are to be rendered, or in similar countries;
 - 4. general knowledge of local language; and
 - 5. the utilization of local consultants.
- (C) the specific point system to be used as selection criteria. This system shall include at least the following factors:
 - 1. qualifications and experience of personnel to be assigned;
 - 2. evaluation methodology (where applicable);
 - 3. proposed method of implementation;
 - 4. execution schedule;
 - 5. language proficiency; and
 - 6. management support systems to assure quality control during execution of the consulting services (regular reports, budget controls, etc.).
- (D) the specific local laws, taxation requirements and procedures which may be relevant to the selection and contracting of the consultant firm.
- (E) if it is estimated that the cost of the services will exceed two hundred thousand United States dollars (US\$200,000) or its equivalent, calculated in accordance with the provision of Article 3.05(a) of the General Conditions, 6/ the selection and contracting shall be advertised in the Development Business of the United Nations and in the national press. These announcements should state the intention of contracting professional consulting services along with a brief description of the services required and inviting interested firms and consortia to apply and to furnish detailed information regarding their technical ability, prior experience with similar work, etc. within 30 days of the date of publication. This announcement should also advise interested firms and consortia of the requirement of maintaining an updated DACON registration form with the

6/ In the case of Technical Cooperation Agreements, the pertinent Section of the Agreement shall be quoted.

Bank and of submitting a copy of this form to the contracting entity with their statement of interest. A copy of the announcements shall be sent to each embassy of the member countries of the Bank accredited in the country. Clippings of these advertisements shall be sent to the Bank specifying the date and the name of the publication in which they have appeared;

- (ii) The terms of reference (specifications) describing the work to be done by the firm, together with an estimate of the cost; and
 - (iii) A list of at least three and no more than six firms from which proposals for the work would be invited.
- (b) Once the Bank has approved the foregoing requirements, the approved firms shall be invited to present proposals in conformity with the procedures and terms of reference approved. The approved firms shall be informed regarding the specific selection procedure and evaluation criteria adopted, specific local laws, taxation requirements and procedures relevant to the selection of consulting firms as well as the names of the other firms invited to present proposals.
- (c) In the invitations to present proposals the use of one or the other of the following procedures shall be specified, as appropriate:
- (i) If the first procedure is utilized, a single sealed envelope including only the technical proposal, without a price quotation, shall be used. The (Borrower) (Executing Agency) (IFI) (Beneficiary) shall examine the proposals received and establish their order of merit. If the complexity of the case so requires, the (Borrower) (Executing Agency) (IFI) (Beneficiary) may resort, with the prior approval of the Bank and at its own expense, to the use of consulting services to review the proposals and provide technical and expert advice in establishing the order of merit.

Once an order of merit has been established among the firms, the firm listed as first shall be invited to negotiate a contract. During these negotiations the details of the terms of reference shall be reviewed completely to assure full and mutual understanding with the firm; the contractual and legal requirements of the agreement shall be reviewed; and finally, detailed costs shall be developed. If agreement cannot be reached with the firm on the terms of the contract, it shall be notified in writing that its proposal has been rejected and negotiations shall be initiated with the second firm and so on until a satisfactory agreement has been reached;

- (ii) If the second procedure is utilized, two sealed envelopes shall be used for presenting proposals, the first containing the technical proposal exclusive of costs and the second containing the proposed costs for the services.

The (Borrower) (Executing Agency) (IFI) (Beneficiary) shall analyze the technical proposal and establish their order of merit. Contract negotiations shall commence with the firm offering the best technical proposal. The second envelope presented by this firm shall be opened in the presence of one or more of its representatives and shall be utilized in the contract negotiations. All the second envelopes presented by the other firms shall remain sealed and, if an agreement is reached with the first firm, they shall be returned unopened to the respective firms. If an agreement on the terms of the contract is not reached with the first firm, it shall be notified in writing of its rejection and negotiations shall be initiated with the second firm and so on until a satisfactory agreement is reached.

- (iii) Inability to agree on detailed costs or compensation for services or a judgment on the part of the (Borrower) (Executing Agency) (IFI) (Beneficiary) that such costs or compensation are inappropriate or excessive, shall be sufficient cause for the rejection of the proposal and for the initiation of negotiations with the firm which follows in the order of merit. Once a firm has been rejected it shall not be recalled for further negotiations on such contract.
- (d) Before initiating negotiations with a firm based on the order of merit, the (Beneficiary) (Borrower) (Executing Agency) (IFI) shall provide the Bank with a copy of the report summarizing the evaluation of technical proposals submitted by the short listed firms identified in Section 5.01(a)(iii) of this Annex.
- ((e) The final draft of the contract negotiated with the consulting firm shall be submitted for the approval of the Bank by the (Borrower) (Executing Agency) before the contract is signed. A true copy of the text, as signed, shall be promptly sent to the Bank.) 7/
- ((e) The final draft of the contract negotiated with the consulting firm shall be submitted by the (Beneficiary) (Executing Agency) (IFI) for the approval of the (Borrower) (Executing Agency) (Beneficiary), which in turn shall require the agreement of the Bank before it is signed. A true copy of the text as signed shall be promptly sent to the Bank.) 8/

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- 7/ This alternative shall be used when the Borrower or Executing Agency will directly contract the firm.
 - 8/ This alternative shall be used when the IFI or a beneficiary will contract the firm.

B. Selection and Contracting of Individual Experts

5.02 In the case of the selection and contracting of individual experts:

((a) Before the selection of the experts, the (Borrower) (Executing Agency) shall submit the following for the consideration of the Bank:) 9/

((a) Before the selection of the experts, the (IFI) (Beneficiary) (Executing Agency) shall submit the following for the approval of the (Borrower) (Executing Agency) (Beneficiary), which in turn shall require the agreement of the Bank:) 10/

(i) The selection procedure;

(ii) the terms of reference (specifications) and the schedule of the services to be performed in the respective study;

(iii) the names of the experts tentatively selected, setting forth in detail their nationality, domicile, background, professional experience and knowledge of languages; and

(iv) the form of contract to be used in retaining the experts.

(b) Once the (Borrower) (Beneficiary) (Executing Agency) and the Bank have approved the foregoing requirements, the (Borrower) (Executing Agency) (Beneficiary) (IFI) shall proceed to contract the experts. The contract to be entered into with each of them shall be consistent with the form of contract which the Bank and the (Borrower) (Beneficiary) (Executing Agency) shall have agreed upon. A true copy of the signed text of each contract shall be sent promptly to the Bank.

5.03 Notwithstanding paragraphs 5.01 and 5.02 above and at the request of the (Borrower) (Executing Agency), the Bank may assist in the selection and contracting of the Consultants as well as in drafting the pertinent contracts. It is understood however, that the final negotiation and signing of such contracts, under terms and conditions acceptable to the Bank, shall be the sole responsibility of the (Borrower) (Executing Agency) (IFI) (Beneficiary) and that the Bank assumes no commitment on this matter.

9/ This alternative shall be used when the Borrower or the Executing Agency will directly contract the expert.

10/ This alternative shall be used when the IFI or a beneficiary will contract the expert.

VI. CURRENCIES OF PAYMENT TO CONSULTANTS

6.01 The following provisions are established with respect to the currencies with which the Consultants shall be paid: 11/

(a) Payments to Consulting Firms: Contracts entered into with consulting firms shall reflect one of the following formulations, as the case may be:

- (i) If the consulting firm is domiciled in the country in which it is to perform the services, its compensation shall be paid exclusively in the currency of that country, except for expenses incurred in foreign exchange for foreign travel or per diem expenses abroad which shall be reimbursed in dollars, or its equivalent in other currencies that form part of the Financing 12/, except that of the country wherein the study is made;
- (ii) if the consulting firm is not domiciled in the country in which it is to perform the services, the highest possible percentage of its compensation shall be paid in the currency of such country and the rest in dollars or the equivalent in other currencies that form part of the Financing, except that of such country, with the understanding that the part corresponding to per diem expenses shall be paid in the currency of the country or countries in which the respective services are to be performed. In the event that the percentage to be paid in the currency of the country in which the services are to be performed is less than 30% of the total compensation of the consulting firm, a complete and detailed justification shall be submitted (to the Bank for its examination and comments) 13/ (to the (Borrower) (Beneficiary) (Executing Agency), which in turn shall submit it to the Bank for its examination and comments); 14/
- (iii) in the case of a consortium composed of firms domiciled in the respective country and firms not domiciled therein, the part of the compensation which corresponds to each of the members shall be paid in accordance with paragraphs (i) and (ii) above, as pertinent; and

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- 11/ Technical Cooperations financed with certain funds may establish other forms of payment to Consultants, such as payment in only one currency (e.g. Yen). In such cases, Paragraph VI should be modified to reflect such forms of payment.
 - 12/ In Technical Cooperation Agreements, the appropriate term shall be used (Contribution, Credit, etc.)
 - 13/ This form shall be used when the Borrower or the Executing Agency will directly contract the Consultants.
 - 14/ This form shall be used when the IFI or beneficiaries will contract the Consultants.

- (iv) the provisions of Article 3.05(a) of the General Conditions 15/ shall apply with respect to the rate of exchange.

(b) Payments to Individual Experts:

- (i) If the expert is domiciled in the country in which his/her services are to be performed, his/her honoraria shall be paid exclusively in the currency of that country;
- (ii) if the expert is not domiciled in the country in which his/her services are to be performed and is hired to work for less than six months, his/her honoraria and per diem shall be paid totally in United States of America dollars;
- (iii) if the expert is not domiciled in the country in which his/her services are to be performed and is hired to work six or more months, his/her honoraria and post adjustment shall be paid in the following manner: (1) 40% in the currency of that country; and (2) 60% in United States of America dollars. Per diem, installation and change of residence allowances and withholding of compensation when applicable, shall also be paid in United States of America dollars;
- (iv) fixed lump sum compensation for services, including honoraria, transportation tickets and per diem, may be paid in United States dollars; and
- (v) the provisions of Article 3.05(a) of the General Conditions shall apply with respect to the rate of exchange. 16/

VII. RECOMMENDATIONS OF CONSULTANTS

- 7.01 It is understood that the opinions and recommendations of the Consultants obligate neither the (Borrower) (Executing Agency) (Beneficiary) (IFI) nor the Bank, and that they reserve the right to put forward such observations or exceptions as they deem appropriate.

VIII. SCOPE OF COMMITMENT OF THE BANK

- 8.01 It is agreed that the Bank assumes no commitment to finance all or part of any programme or project which, directly or indirectly, might result from the services performed by the Consultants.

15/ In the case of the Technical Cooperation Agreements, the pertinent Section of the Agreement shall be quoted.

16/ In the case of the Technical Cooperation Agreements, the pertinent Section of the Agreement shall be quoted.

IX. SPECIAL CONDITIONS AND REQUIREMENTS

- 9.01 The final payment for services to the Consultants shall be contingent upon prior acceptance by the (Borrower) (Beneficiary) (Executing Agency) and the Bank of the Consultant's final report. Such payment shall consist of not less than 10% of the total amount to be paid to the Consultants in the accordance with their respective contracts.**