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## **CHILE**

### **PROGRAM FOR MODERNIZING AND IMPROVING THE AGRICULTURAL SECTOR**

**(CH-0027)**

### **LOAN PROPOSAL**

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CHILE  
PROGRAM FOR MODERNIZING AND IMPROVING  
THE AGRICULTURAL SECTOR

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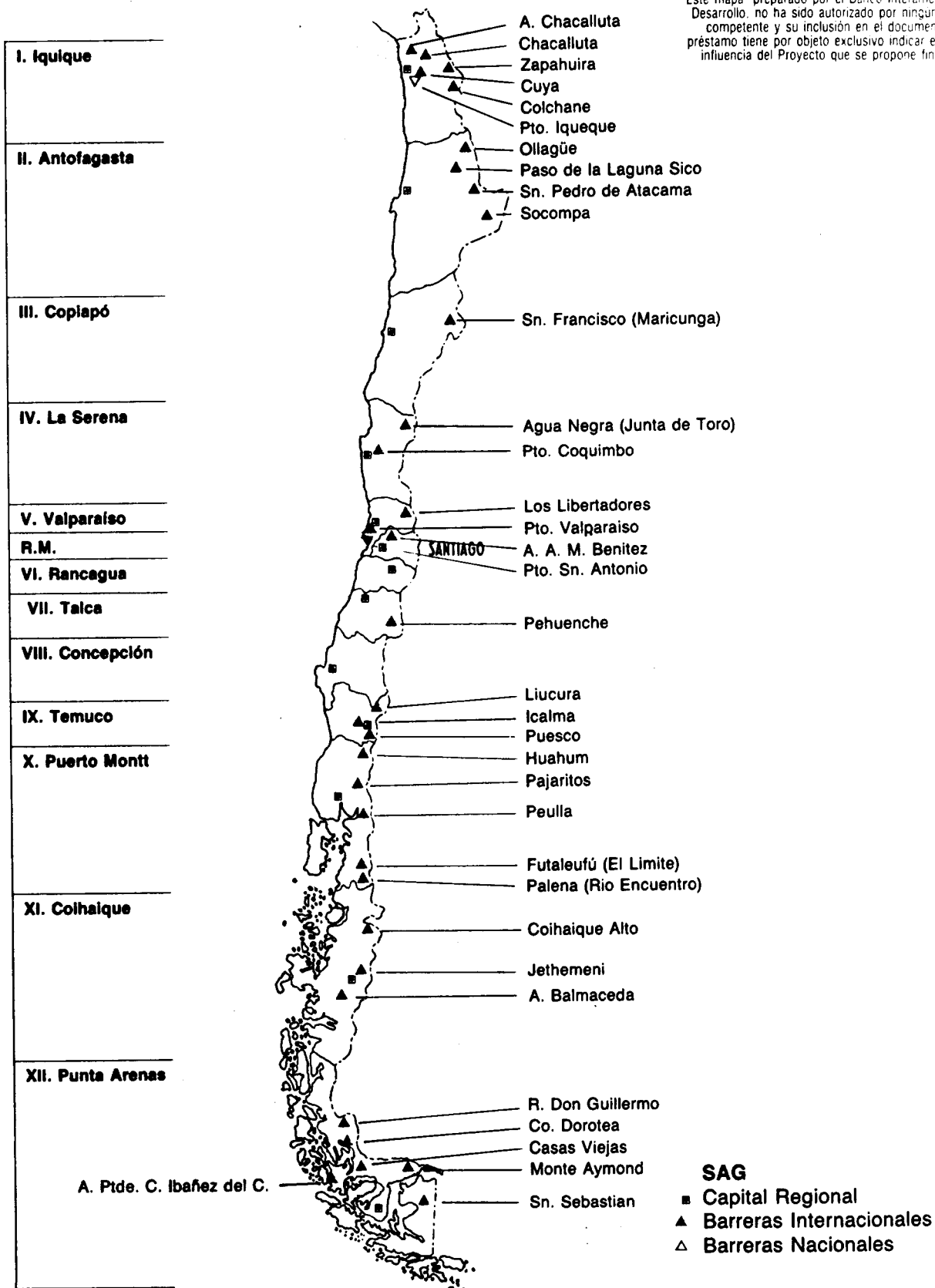
LIST OF ABBREVIATIONS

CATT	Technology Adaptation and Transfer Center
CONAF	National Forestry Corporation
CORFO	Chilean Development Corporation
DEP	Research and Budget Division
EEC	European Economic Community
GTT	Technology transfer group
IEO	International Epizootic Organization
INDAP	Agricultural Development Institute
INIA	National Agricultural Research Institute
MAG	Ministry of Agriculture
OAS	Organization of American States
SAG	Agricultural Service
SEREMIS	Regional Ministerial Secretariats
SIG	Geographic information system
TIE	Sterile Fly Techniques Laboratory
USDA	United States Department of Agriculture

# CHILE

## PROGRAMA DE MODERNIZACION Y MEJORAMIENTO DEL SECTOR PUBLICO AGROPECUARIO DISTRIBUCION REGIONAL DE BARRERAS SANITARIAS DEL SERVICIO AGRICOLA Y GANADERO

Este mapa, preparado por el Banco Interamericano de Desarrollo, no ha sido autorizado por ningún órgano competente y su inclusión en el documento de préstamo tiene por objeto exclusivo indicar el área de influencia del Proyecto que se propone financiar.





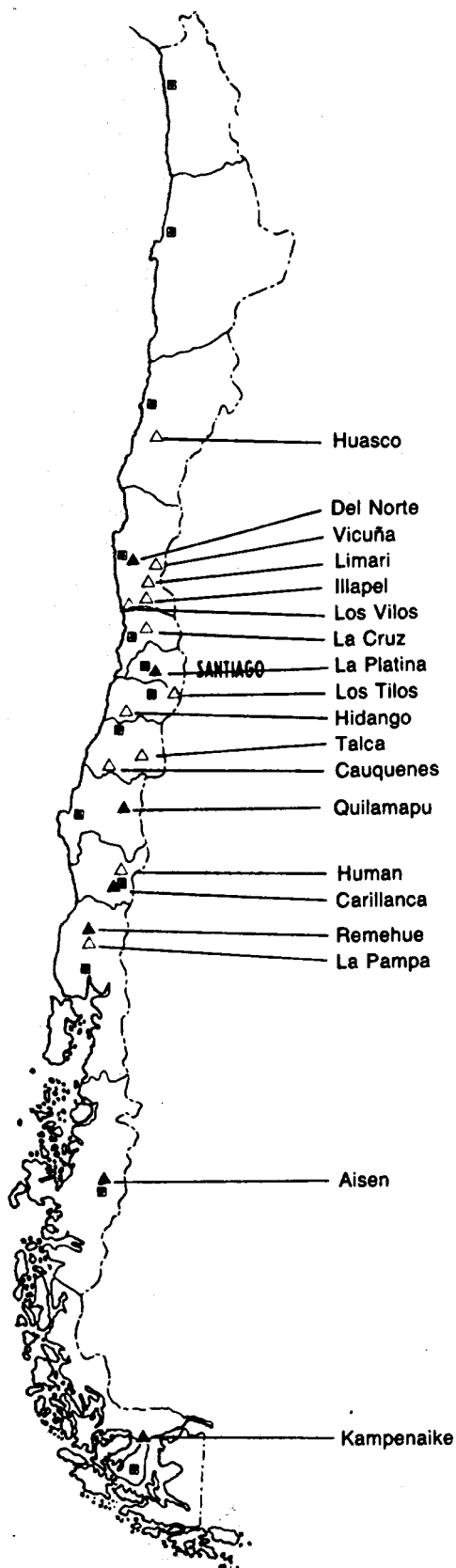
# CHILE

## PROGRAMA DE MODERNIZACION Y MEJORAMIENTO DEL SECTOR PUBLICO AGROPECUARIO

### LOCALIZACION DE LAS INSTALACIONES EXPERIMENTALES DEL INSTITUTO DE INVESTIGACIONES AGROPECUARIAS

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<b>I. Iquique</b>
<b>II. Antofagasta</b>
<b>III. Copiapó</b>
<b>IV. La Serena</b>
<b>V. Valparaíso</b>
<b>R.M.</b>
<b>VI. Rancagua</b>
<b>VII. Talca</b>
<b>VIII. Concepción</b>
<b>IX. Temuco</b>
<b>X. Puerto Montt</b>
<b>XI. Colchagua</b>
<b>XII. Punta Arenas</b>

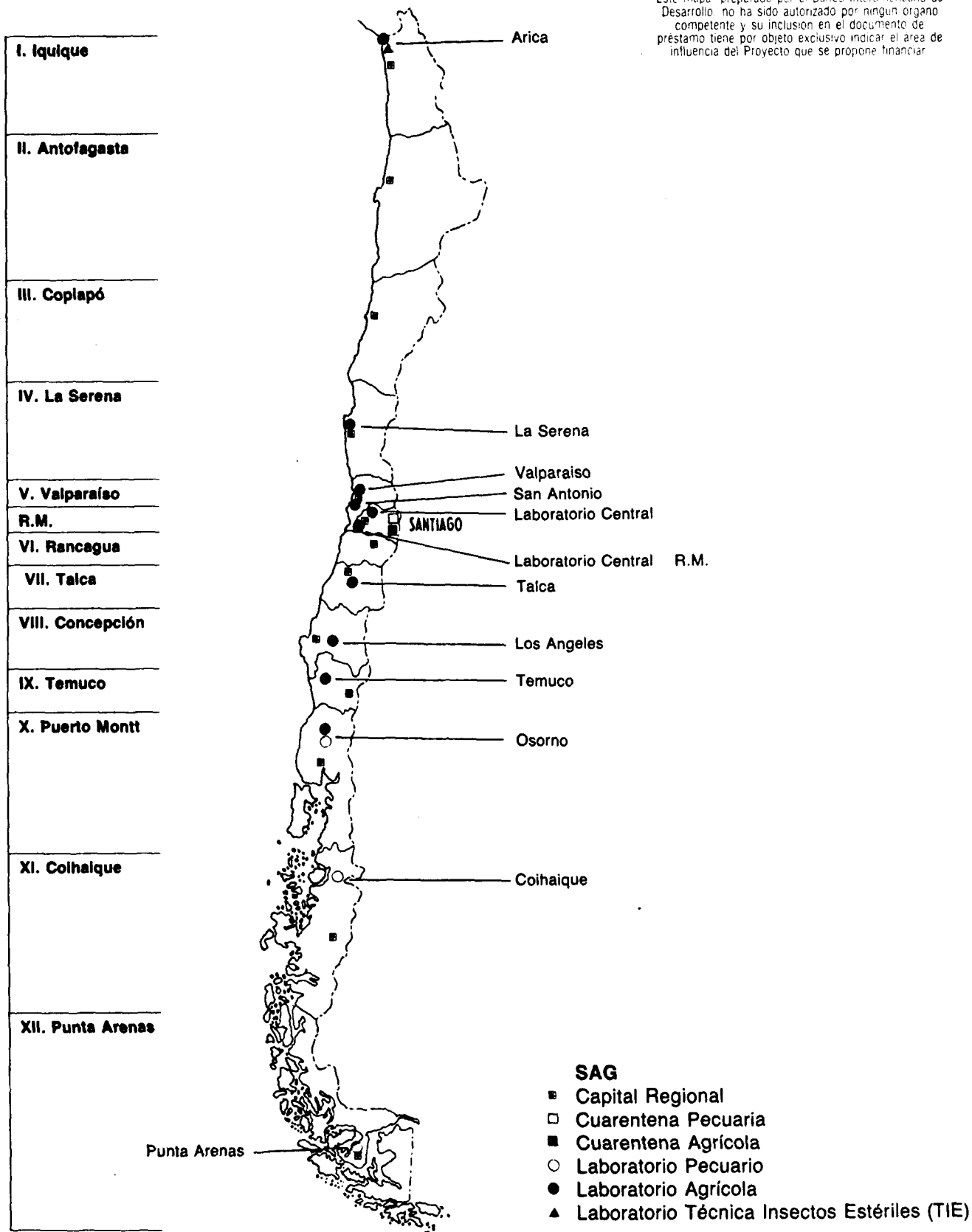


- INIA**
- Capital Regional
  - ▲ Estación Experimental
  - △ Subestacion Experimental

# CHILE

## PROGRAMA DE MODERNIZACION Y MEJORAMIENTO DEL SECTOR PUBLICO AGROPECUARIO DISTRIBUCION REGIONAL DE LABORATORIOS Y ESTACIONES CUARENTENARIAS AGRICOLAS Y PECUARIAS DEL SERVICIO AGRICOLA Y GANADERO

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## Basic Socioeconomic Data of Chile

### 1. General

Total Population Estimated Through June 1991 (Thousands)	13,386.0
Percentage of Urban Population:	
Census April 1982	82.2
Projection June 1991	84.9
Land Area (Km2) (Thousands)*	756,629.0
Population Density by Inhabitant Km2 (1991)	17.7
Population Growth Rate (1985-90) (per thousands inhabitants)**	
Country Total	16.64
Metropolitan Region of Santiago	21.50
Birth Rate per 1,000 inhabitants (1985-90)**	23.83
General Mortality Rate per 1,000 inhabitants (1985-90)**	6.40
Infant Mortality Rate per 1,000 live births (1985-90)**	18.14
Life Expectancy at birth (1985-90)**	71.48
Urban Population Provided with Drinking Water (1985)	
(Percentage of the Total Urban Population)	94.31
Number of persons per Medical Doctor (1982)	1,000.0
Literacy Rate (percentage) (1987)	92.5
Energy Consumption per Capita in Kwh (1983)	1,065.0
Low Income Level per Inhabitant	
(December 1988 in pesos)	141,556
(December 1989 in pesos)	178,000
(December 1990 in pesos)	220,332
<u>Exchange Rate</u> (Pesos per Dollar)	
Average 1984	98.5
Average 1985	160.9
Average 1986	192.9
Average 1987	219.4
Average 1988	245.0
Average 1989	267.2
Average 1990	305.1
<u>Labor Force</u> (Thousands of Inhabitants)	
Country Total (October-December 1990)	4,728.6
Gran Santiago (October-December 1990)	1,786.7
<u>Employment</u> Country Total (October-December 1990) (Thousands of Persons)	
Employed	4,459.6
Unemployed	269.0
Laid-off	229.4
Seeking Employment for the First Time	39.6
<u>Employed Population by Economic Activity</u> (Country Total)	
(Percentage of Total Employment October-December/90)	100.0
Agriculture, hunting, forestry and fishing	19.2
Quarry and Mining	2.3
Manufacturing Industries	16.1
Construction	6.4
Trade	17.7
Government and Financial Services	4.5
Electricity	0.5
Communal and Social Services	26.4
Transportation, Storage and Communications	6.9
Unemployment (National Average, October-December, 1990) (Percentage)	5.7

\* It does not include the Chilean Antarctic Territories.

\*\* INE. Population Projections by Sex and Age. Country Total 1950-2025. Fasc. F/CHI.1. Santiago, Chile, April 1988 (Table 4 p. 41).

onal Accounts	1980	1986	1987	1988	1989
(Millions of Current Pesos)	1,075,269	3,246,106	4,159,762	5,411,025	6,778,442
(Millions of 1977 Pesos)	363,446	376,627	398,230	427,530	470,243

	Composition						Real Annual Growth Rate b/					
	1980	1986	1987	1988	1989	1990	1976-79	1980	1985	1986	1987	1988
Domestic Product (GDP)	100.0	100.0	100.0	100.0	100.0	100.0	7.5	7.5	2.4	5.7	5.7	7.4
Expenditure on GDP a/												
Consumption	84.5	81.6	79.0	75.8	76.0	76.8	7.3	4.0	-1.0	3.8	3.8	9.0
Private	72.2	68.9	67.6	65.3	66.2	67.1	7.7	6.5	-1.1	4.9	4.8	9.6
Public	12.3	12.7	11.4	10.5	9.8	9.7	-1.1	-5.9	-0.3	-2.1	-2.1	4.7
Domestic Investment	18.0	14.6	16.9	17.0	20.3	20.3	18.2	-0.2	-6.6	13.1	25.8	16.7
Fixed Investment	17.2	14.6	16.0	16.8	18.4	19.5	8.7	24.4	14.8	7.1	16.2	10.7
Exports of Goods and Services	21.1	30.6	33.5	37.4	37.9	36.6	15.4	12.7	6.9	9.8	8.8	6.1
Imports of Goods and Services	23.6	26.8	29.4	30.2	34.2	33.7	19.1	8.7	-11.0	9.7	17.0	12.1
Origin b/												
Agriculture, Forestry and Fishing	8.3	9.9	9.6	9.5	9.0	9.1	2.7	1.8	5.6	8.8	3.2	5.5
Mineral Mining	7.2	8.4	7.9	7.7	7.6	7.4	9.0	5.4	2.2	1.4	0.0	4.2
Manufacture	21.5	20.8	20.8	21.0	21.0	20.6	7.9	6.2	1.2	8.0	5.5	8.7
Construction	5.3	5.5	5.8	5.7	5.9	5.9	1.4	25.7	16.1	1.3	10.6	6.1
Electricity, Gas and Water	2.1	2.6	2.5	2.6	2.5	2.5	6.3	5.9	3.5	6.5	3.8	9.3
Transportation, Storage and Communication	5.5	5.7	6.0	6.2	6.4	6.9	8.3	11.1	5.5	8.1	10.1	11.5
Trade	18.5	16.7	17.0	17.4	18.0	18.1	14.6	10.8	1.7	5.5	7.5	9.8
Others	31.6	30.4	30.4	29.9	29.6	29.5	10.3	6.6	-0.8	5.0	5.8	5.8

at current market prices.  
at constant prices of 1977.

Central Bank of Chile. Boletín Mensual (several numbers) and direct proportional information to IDE.

	Millions of Dollars						Annual Growth Rate			
	1980	1985	1987	1988	1989	1990 a/	1980	1985	1987	1988
<u>Exterior Trade</u>										
<u>Exports of Goods (FOB)</u>	4,705	3,804	5,224	7,052	8,080	8,310	22.7	4.2	24.4	35.0
Agriculture	340	515	796	930	995	979	28.8	20.3	16.6	16.8
Manufacture	1,751	1,168	1,824	2,273	2,613	2,741	25.2	-7.3	28.5	24.6
Mining	2,615	2,121	2,603	3,849	4,473	4,590	20.4	8.2	24.2	47.9
(Copper)	(2,125)	(1,789)	(2,235)	(3,416)	(4,021)	(3,795)	-	11.5	27.9	52.9
<u>Imports of Goods (CIF)</u>	6,145	3,268	4,396	5,292	7,144	7,678	30.5	-10.6	27.9	20.4
<u>Consumption</u>	2,070	751	900	1,089	1,492	1,492	-	-26.2	19.4	21.0
Intermediate	2,801	1,867	2,395	2,833	3,703	4,313	-	-9.5	23.0	18.3
Capital	1,274	650	1,101	1,370	1,949	2,322	34.6	13.5	49.7	24.4
Millions of Dollars										
<u>Balance of Payment</u>	1980	1985	1986	1987	1988	1989				
<u>Current Account</u>	1,971	-1,329	-1,137	-811	-167	-905				
Trade Balance	764	849	1,100	1,229	2,219	1,578				
Exports FOB	4,705	3,804	4,199	5,223	7,052	8,080				
Imports FOB	5,469	2,955	3,099	3,994	4,833	6,502				
Net Services	-1,320	-2,239	-2,320	-2,163	-2,563	-2,723				
Net Transfers	113	61	84	126	177	240				
<u>Capital Account</u>	3,241	1,229	797	1,021	1,102	1,278				
Foreign Investment	170	112	319	923	1,011	1,583				
Other Capital Flows	3,071	1,117	478	98	91	-304				
Errors and Omissions	50	-3	88	-91	-110	-74				
Change in reserves	1,321	-103	-252	122	825	437				
Current Account/GDP (%)	7.1	8.3	6.9	4.3	0.7	3.6				
Exchange Rate (Pesos per Dollar Annual Average)	39.0	160.9	192.9	219.4	245.0	267.2				

Preliminary.

Source: Central Bank of Chile.

Central Government (Percentages GDP) <u>a/</u>						
5. <u>Public Finances</u>	<u>1980</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Current	32.9	28.6	28.1	20.4	28.7	28.4
(Tax Revenue)	(24.1)	(20.0)	(21.5)	(20.8)	(19.8)	(20.5)
Current Expenditure	26.5	29.5	27.2	26.2	23.3	20.0
Current Account	6.4	-0.9	0.9	2.3	5.4	8.5
Capital Expenditure	2.8	3.1	3.3	3.4	2.9	2.7
Deficit (-) Overall Surplus (+)						
Total <u>b/</u>	3.6	-3.6	-1.6	-0.5	3.3	6.1

a/ Includes Central Government, municipalities and decentralized institutions.

b/ Adjusted with capital revenue.

Source: Ministerio de Hacienda, Dirección de Presupuesto y Contraloría General de la República.

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	Billions of Pesos as of December 31						Annual Growth Rate Percentage				
	1980	1986	1987	1988	1989	1990	1980	1985	1986	1987	1988
and Credit y System a/											
Sector Money (M1)	78.2	181.7	199.6	364.0	412.2	425.0	-4.0	11.3	41.4	9.8	82.4
ncy	36.1	108.6	135.7	181.5	221.6	231.9	20.9	12.6	36.5	25.0	33.8
and Deposit	42.1	73.2	63.9	182.5	190.6	193.1	-25.0	-8.0	49.2	-26.6	185.6
posit	129.3	462.2	757.6	964.3	1,309.4	1,690.6	75.3	40.1	19.0	63.9	27.3
Private Sector Deposits (M2)	207.5	644.0	957.2	1,328.3	1,721.7	2,348.6	45.5	31.6	24.6	48.6	38.8
al System b/											
n Domestic Currency	324.8	1,256.2	1,586.5	1,987.5	2,742.3	3,054.1	63.3	31.7	15.7	26.3	25.3
n Foreign Currency ions of Dollars)	5,614.0	2,033.0	2,073.0	2,164.0	2,330.0	2,702.0	41.6	-29.0	-0.3	2.0	4.4

es Central Bank of Chile, Banco del Estado and private institutions.  
es monetary system and other financial institutions.

tral Bank of Chile. Boletín Mensual (several issues).

	Annual Rate (Percentage)							December to December (Percentage)				
	1975	1980	1985	1987	1988	1989	1990	1975	1980	1985	1987	1988
e	375.0	35.1	30.7	19.9	14.8	17.0	25.9	340.7	31.2	26.4	17.4	12.7
ator	482.0	39.6	43.4	19.2	5.9	15.1	21.8	410.9	28.1	30.2	18.2	3.3
/	486.1	28.8	33.0	28.1	30.1	25.9	25.1	-	-	-	-	-
	55.94	99.17	64.28	81.09	118.00	129.11	-	-	-	-	-	-

etal Exchange. Cents per pound, annual average.

tituto Nacional de Estadística (INE) and Central Bank of Chile (BOCH).

	Millions of Dollars at Year-end						
	<u>1976</u>	<u>1980</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
<u>Total External Debt</u>	<u>5,233</u>	<u>11,207</u>	<u>20,529</u>	<u>20,829</u>	<u>20,660</u>	<u>18,960</u>	<u>17,518</u>
<u>External Public Debt</u>	<u>4,275</u>	<u>5,186</u>	<u>15,164</u>	<u>17,091</u>	<u>17,832</u>	<u>16,014</u>	<u>13,293</u>
Short-Term	287	343	1,564	1,384	1,655	1,601	1,901
Medium- and Long- Term	3,475	4,720	12,515	14,379	14,725	13,091	10,124
Financial Public Sector	541	1,257	5,269	5,608	5,749	4,809	3,268
Non-Financial Public Sector	2,904	3,391	5,836	5,836	6,302	6,211	5,776
Private Sector with Publicly Guaranteed	30	72	2,001	2,935	2,674	2,052	1,060
International Monetary Fund	513	123	1,085	1,328	1,452	1,322	1,268
<u>Private Debt</u>	<u>958</u>	<u>6,021</u>	<u>5,365</u>	<u>3,738</u>	<u>2,828</u>	<u>2,946</u>	<u>4,225</u>
Short-Term	159	1,328	230	303	362	585	1,072
Medium- and Long-Term	799	4,693	5,135	3,435	2,466	2,361	3,153
<u>Total External Debt Service</u>		<u>1980</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Service (Amortization + Interest) <u>1/</u> (Millions of Dollars)		2,600	2,469	2,467	1,974	2,447	2,620
Service/Exports of Goods and Non-Factor Services (%)		43.6	55.2	46.2	31.3	29.6	27.6

Preliminary.  
In amortization the IMF is excluded.  
. Not available.

Source: Central Bank of Chile (BCCF).



9. <u>IDB Loans Approved from 1961</u> <u>Through December 31, 1989</u>	<u>Millions</u> <u>of Dollars</u>	<u>Relative</u> <u>Composition</u>	<u>Disbursement</u> <u>(Millions of</u> <u>Dollars)</u>	<u>Percentage</u> <u>of Total</u> <u>Commitment</u>
<u>Total Committed</u>	<u>4,018.1</u>	<u>100.0</u>	<u>3,083.6</u>	<u>76.7</u>
Ordinary Capital	3,770.8	93.8	-	-
Fund for Special Operations (FSO)	203.3	5.1	-	-
Social Progress Trust Fund (SPTF)	34.4	0.9	-	-
Other Funds	9.6	0.2	-	-
<u>By Sector</u>				
Agriculture and Fishing	722.5	18.0	-	-
Industry and Mining	668.0	16.6	-	-
Transportation and Communications	724.0	18.0	-	-
Energy	1,027.3	25.6	-	-
Public Health	224.0	5.6	-	-
Urban Development	579.6	14.4	-	-
Education	28.9	0.7	-	-
Export Financing	3.9	0.1	-	-
Preinvestment	3.0	0.1	-	-
Tourism	36.9	0.9	-	-

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Source: Inter-American Development Bank (IDB).

**CHILE**  
**PROGRAM FOR MODERNIZING AND IMPROVING THE**  
**AGRICULTURAL SECTOR**

**(CH-0027)**

**I. INTRODUCTION**

**A. Background**

- 1.1 The proposed program seeks to maintain the agribusiness sector's impetus over the medium and long term by generating innovations designed to support technology transfer for the purpose of increasing productivity and improving competitiveness in external markets. The efficiency of production by small farmers for domestic consumption would likewise be improved. In order to achieve these aims the agricultural public sector will have to develop and modernize its support services, which include agricultural research, dissemination of technological innovations, health protection, price and market information systems, and natural resource conservation management.
- 1.2 The program is designed to strengthen those critical areas of the sector on which achievement of the stated objectives hinges, and to that end it has been divided into three subprograms: Subprogram for Modernizing the Agroforestry Health Protection System, to be executed by the Agricultural Service (SAG); Subprogram for Modernizing the Technology Research and Transfer System, to be executed by the National Agricultural Research Institute (INIA); and the Subprogram for Institutional Strengthening of the Research and Budget Division (DEP) of the Ministry of Agriculture.
- 1.3 The proposed program is consistent with the Bank's current strategy for Chile, which assigns priority to the agricultural sector as an important element in overall economic development. In this connection, control of plant and animal health problems, as well as agricultural technology research and transfer, are considered important factors in maintaining and furthering agricultural sector development, and in sustaining and raising the income level and well-being of agricultural producers, with a view to sustained growth.

**B. IDB operating strategy in Chile**

- 1.4 The Bank's operating strategy in Chile for the period 1991-1993 is designed to support the government's aims which are to increase the investment rate and raise the productivity of resources in a setting of stable prices and fairer income distribution. Therefore, plans call for: (i) modernizing the productive and institutional

infrastructure as well as the requisite legislative framework for fostering the development of sectors engaged in producing goods for merchandise trade, as in recent years, in an open market economy with growing private sector participation; and (ii) improving the socioeconomic condition of the marginal population that has not benefitted from past economic growth.

- 1.5 Accordingly, the IDB will promote: (i) the consolidation of private sector activity, to which end it will support such changes in legislation and regulations as will improve the business climate and increase the ability of private investors, national as well as foreign, to invest in physical infrastructure facilities and in the capital stock of government enterprises; (ii) the reduction of extreme poverty so as to satisfy deferred demands for rehabilitation, expansion and maintenance of health, education and housing services, especially for the low-income population; (iii) the expansion of infrastructure facilities, technology and human resources in the sectors producing goods for merchandise trade; and (iv) the solution of problems associated with environmental pollution and degradation of natural resources. (see Annex I-1, the Chile Operating Program.)

C. Basic data

- 1.6 The borrower: The Republic of Chile.
- 1.7 Executing agency: The Ministry of Agriculture, through the Agricultural Service (SAG), the Agricultural Research Institute (INIA) and the Research and Budget Division (DEP).
- 1.8 General objectives: The program seeks to: (i) modernize and strengthen the agricultural public subsector, by bringing it into line with the requirements of economic growth and exports; (ii) maintain and increase the agroforestry resource base by strengthening the plant and animal health protection system; (iii) increase agroforestry productivity through the generation, adaptation and transfer of technology, with special emphasis on small farming; and (iv) strengthen the sector's ability to generate, analyze and disseminate information.
- 1.9 Program description: The program contains the following three subprograms:
  - a. Modernization of the agroforestry health protection system, to be performed by SAG, in order to establish or improve the agricultural quarantine infrastructure, laboratories, border checkpoints and plant and animal health monitoring. This subprogram includes the following components: (i) strengthening the agricultural and forest health monitoring programs; (ii) strengthening the agricultural quarantine systems and plant and animal health checkpoints; (iii) strengthening the

central and regional laboratories; and (iv) strengthening the support, health education and training services.

- b. Modernization of the technology research and transfer system, to be performed by INIA, made up of the following components: (i) strengthening agricultural research; (ii) strengthening technology transfer, primarily for the purpose of disseminating technology generated by research, with emphasis on small farmers; (iii) strengthening the research and transfer services including the laboratory analysis, library services, publications, biometry and computer services; and (iv) institutional modernization, which involves the strengthening of institutional operations and management through the updating of systems that facilitate planning, execution, evaluation and decision-making.
- c. Institutional strengthening of the Research and Budget Division, to be performed by DEP, which would contain the following components: (i) an agroforestry information system, to compile, process and disseminate information on which to base the design of sector policies; (ii) a geographic information system (SIG); and (iii) the development of information technology.

- 1.10 Total cost and proposed funding: The total cost of the program is US\$ 61 million equivalent. The Bank would finance US\$28.5 million equivalent out of ordinary capital. The counterpart funds would be provided by the Government of Chile in the amount of US\$32.5 million equivalent.

## II. FRAME OF REFERENCE

### A. Agricultural sector: importance and recent performance

- 2.1 Sector size: In 1990 the Chilean agricultural sector contributed 8.3% of the gross domestic product, or \$39.737 billion in 1977 pesos. That share is in line with the figures for the last ten years. The sector employs 19% of the economically active population, or approximately 830,000 workers, and produces about one quarter of the exports. The sector accounts for an estimated 33% of the nation's poor, since 50% of the rural population has incomes below the poverty line. In addition, as the urban population represents almost 85% of the total population of 13.4 million, the June 1991 estimate, the sector now has the important responsibility of supplying the food needs of a large number of people living in towns and villages. Because of the rising trend in agricultural exports, which in 1990 reached US\$2.122 billion, while imports are trending downward and amounted to only US\$374 million in that year, Chile shows a sizable positive balance of US\$1.741 billion in its agricultural trade.
- 2.2 Recent performance: In 1990 the sector grew 4.9%, 2.1% more than the economy as a whole. The livestock subsector grew by 5% and fruits and grains by 4%. Agricultural and forestry exports have increased appreciably in recent years, led by fruits, vegetables and forest products, which contributed 81.8% of sector revenues as follows:

Agricultural and Forestry Exports, 1986-1990 (Millions of US\$)						
Categories	1986	1987	1988	1989	1990	Share of Sector Earnings 1990 (%)
Crops	97.7	95.6	143.0	212.5	228.6	9.7
Vegetables	29.8	40.6	51.2	87.4	116.6	4.5
Livestock	51.4	65.3	72.7	70.5	68.3	4.0
Forest products	393.6	559.7	710.7	761.9	846.4	40.4
Fruits	529.4	598.9	659.8	648.2	862.8	41.4
Total	1101.9	1306.1	1637.4	1780.5	2122.7	100.0

- 2.3 Chilean agricultural imports in 1990 consisted of 113,355 tons of sugar valued at US\$49 million CIF, oils (73,673 tons of soy oil for US\$35.8 million) and other food products valued at US\$80.5 million. Milk imports stood at 130 million liters. Also imported were 21,739 tons of raw cotton for US\$38.3 million and other industrial products worth a total of US\$ 37 million. For the first time since

1983, the importation of 600,000 quintals of wheat was authorized, to cover a seasonal shortfall.

B. Production potential and productive structure

2.4 Natural resource potential: The span of 5,200 kilometers separating Arica from Punta Arenas takes in the Andes in the east, the deserts of the north and the cold regions of the south. This diversity creates numerous microclimates. Described below are four agroclimatic zones, whose location by region is shown on the map included in this report:

- a. Desert, in the north with rainfall of 100-350 mm per year. Agriculture in this zone, which includes Regions I to V, is dependent on irrigation. Recent years have seen rapidly expanding output of table grapes for export.
- b. Semiarid, extending from Region V to the northern part of Region VII. Irrigation makes this the most productive zone in Chile, suited to a wide variety of temperate and subtropical products.
- c. Mediterranean, from the southern part of Region VII to Region X. Precipitation ranges from about 700 mm per year in the coastal rainfed area to 1,500 mm per year in the interior rainfed area, which is sufficient for grasslands and grain and legume crops. The expansion of tree plantations has been concentrated in Region VIII.
- d. Semiarid Patagonian, in Regions XI and XII, where the primary activity is sheep-raising: 70% of the nation's sheep and 10% of its cattle are found here.

2.5 Agricultural sector: productive structure. The sector's productive structure is divided into two rather different main systems. The first is characterized by high levels of investment and advanced technology; it targets its output at external markets with specialized agroindustrial processing and vertical integration. The second is created by some 210,000 small farmers operating outside the modernization process. They engage in cropping and animal husbandry for internal consumption and the domestic market. The small farmer is defined as one who does not employ workers in his production unit, earns no other income and owns less than

twelve HRBs. <sup>1/</sup> An estimated 80% of the small farmers are in Regions VIII and X, in the foothills of the Andes. These are areas of high risk because of climate variation and erosion in the uneven terrain. In recent years, small farmers have contributed a substantial increase in the output of goods produced for the domestic market (wheat and sugar especially), in response to trading terms favorable because of both increasing productivity and adjustments in domestic prices.

C. The agricultural subsector

- 2.6 Wheat is the grain to which the greatest acreage (466,480 ha) is devoted. Output in 1990 was 1,718,214 tons (primarily thanks to a substantial improvement in yield, which rose from 17.7 quintals per hectare in 1980 to 32.7 quintals per hectare in 1989). Maize is the next most important crop (99,590 hectare); output reached its highest level in 1989 with 938,464 tons. Maize production slipped to 823,150 tons in 1990, despite the continual improvement in yield, which rose from 34.9 qq per ha in 1980 to 81.4 qq in 1990. Other grains such as rice, oats, barley and rye are important in crop rotation in the coastal rainfed area. There are also several crops that constitute industrial raw materials, such as colza, sunflower seeds, sugar beets and tobacco. Legumes (beans, lentils and chick peas) are grown mostly on small farms in rainfed areas; their short-term prospects for increased exports are considered good.
- 2.7 Fruit-growing covers a wide range of fruits, headed by table grapes and to a lesser extent avocados, stone fruits (plums, apricots, peaches and nectarines), apples, pears, citruses and nuts. The acreage occupied by industrial orchards increased from 85,400 ha in 1980 to 172,580 ha in 1989, with the greatest increase registered by table grapes (48,800 ha), apples (25,880 ha) and kiwis (10,100 ha). Fruit exports showed an even more spectacular rise, from US\$19 million in 1980 to US\$862 million in 1990. Fruit exports in the season ending on August 31 rose by 10.5% over the period 1989-1990, with 128.5 million cases sold on international markets. Another rise of about 10% is projected for the 1991-92 season, based on more regular rainfall; the opening up of Canadian and Mexican markets, especially for kiwis, apples and grapes; increased shipments to the Far East; and improved prices in Europe.

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<sup>1/</sup> An HRB or hectárea de riego básica [basic irrigation hectare] corresponds to the production equivalent to a hectare of land with use capacity 1, of the Maipo series, without restrictions, with adequate water supply and located in the metropolitan region. The conversion to each category of land by provinces and regions is effected by using a coefficient established in the Agrarian Reform Law (Law 16.640 of 1967) and can signify equivalencies between 0.5 ha with irrigation and excellent climate; 4 ha rainfed; 30 ha in the coastal rainfed area and some 300 ha in the Magellan region.

- 2.8 Reforestation incentives have resulted in an area of 1.3 million hectares planted primarily with pine. One advantage of these exotic species of timber pines is that they reach maturity quickly. Their short logging cycle of 20 years from planting to harvesting largely explains why exports of forestry products increased from US\$580 million in 1980 to US\$862 million in 1990.

D. Livestock subsector

- 2.9 This sector includes dairy-farming, beef cattle raising, sheep, poultry and hog farming. In 1990 the livestock population was estimated at 3.2 million cattle, 5.1 million sheep, 1.5 million pigs and 8.2 million poultry. Cattle is characterized by slow herd growth, so demand must be met through imports. The numbers of cattle and sheep have fallen during the past decade while the pig and poultry population expanded significantly as a result of the concentration of production in large vertically integrated business operations. This change tended to eliminate traditional producers from the market.
- 2.10 Dairy-farming is characterized by its extensiveness and by the large numbers of small farmers with dual-purpose operations. The fragmentation of agricultural property meant an alteration in the levels of livestock productivity, inasmuch as the new producers showed a low level of efficiency, the chief constraints on development being the lack of technology transfer and poor marketing practices. From 1985 forward, production and the industry in general enjoyed considerable development, partly thanks to the favorable prices received by producers, especially in the south. By 1990 output was estimated at 1.380 billion liters. Potential is felt to exist for increased production through emphasis on improvements in feeding, management and breeding.
- 2.11 Chile reports classic swine fever and Newcastle disease as the only diseases which the International Epizootic Organization (OIE) classifies as transmissible with serious economic consequences, in list A. The country has been free of hoof-and-mouth disease since 1981. New outbreaks in 1984 and 1987 were eliminated by preventive slaughtering. Several measures are taken to control hoof-and-mouth disease: an ongoing reporting system, summer pasture control which keeps commercial cattle away from the Andes range near the border with Argentina, in Regions V and Metropolitan to IX, and the use of satellite images with partial digital identification supplemented with field identification. This work was supported by the Space Studies Center of the University of Chile.
- 2.12 The following diseases considered important from the socioeconomic point of view (OIE, list B), and also affecting international trade in livestock animals and products, are present: (i) anthrax; (ii) echinococcosis in canines and hydatid disease in sheep; (iii) rabies in Region VIII; (iv) tuberculosis and brucellosis bovina, with obligatory vaccination of calves in Regions IV and X



(Strain 19) and open-range certification program in Regions VII, IX and X; (v) enzootic leukosis bovine, open-range certification program in Regions VIII, IX and X; and (vi) infectious anemia, with sampling program in the equine population.

- 2.13 Conclusions concerning the potential of and the constraints inherent in the productive structure: Chile has used its productive resources with great efficiency. However, there is an imbalance in the distribution of benefits, with booming agriculture for export side-by-side with severe poverty in the important small-farming segment. There is room for optimism with respect to the potential for adapting technology which might strengthen export crops, increasing their yields and even supporting the introduction of new lines capable of sustaining the current effort. This decision is necessary given Chile's espousal of more open trade. Politically, too, willingness exists to improve conditions for small farmers by introducing easily made changes in production and adaptable technologies that promise favorable results under conditions of low rainfall and uneven terrain.
- 2.14 Fruit-growing is expected to continue, given major comparative advantages offered by Chile's ability to provide the northern hemisphere with off-season fruit, lower production costs thanks to relatively cheap labor, availability of sufficient volume to fill specific market niches, a favorable climate and excellent administrative ability. <sup>2/</sup> However, fruit-growing for export may be approaching overproduction, especially in new crops such as table grapes and kiwi, which could bring lower prices and quality.

E. Agricultural institutions and services

- 2.15 The public institutional structure of the sector is defined by MAG and its official agencies. MAG is responsible for coordinating all agricultural sector activities. It is structured with a small office at the highest level, namely the Undersecretariat of Agriculture, which includes an administrative unit, a legal office and a research and budget division. In 1982, 13 regional secretariats were created specifically to provide channels of communication, with the aim of introducing the policies and norms set at the central level to the regional level. The policy executing agencies are INIA, SAG, the National Forestry Corporation (CONAF) and the Agricultural Development Institute (INDAP).
- 2.16 Research Services. The main agency charged with research is INIA, which is currently a corporation under private law supervised by MAG, with the specific objectives of creating, adapting and

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<sup>2/</sup> C. Barriga et al., KIWIS. Situación actual y perspectivas, Corporación de Fomento de la Producción, Santiago, 1989; and BERRIES. Situación actual y perspectivas, idem.

transferring technologies to the agricultural sector. INIA is active in the following areas: vegetable production, animal production, environmental resources, technology transfer and documentation and information. In carrying out technology transfer, INIA provides services directly to farmers, distributes basic seeds in more than 50 varieties which it has created or introduced, and offers laboratory services including soil fertility analysis, physical soil tests, fertilizers, foliating and others.

- 2.17 **Extension services.** INDAP is a decentralized agency supervised by MAG. Its coverage is nationwide but it focuses on technology transfer in poor rural areas. It assists small farmers in matters relating to agricultural technology and the farmers' financing needs. Under the heading of rural development it attempts to offer solutions to the problems of small agricultural enterprise. INDAP serves some 26,000 farmers and wishes to increase its coverage to 180,000. It works in coordination with INIA to support technology transfer to small farmers and to integrate the adoption mechanism in terms of defining local problems, additional research needs and the training of extension workers.
- 2.18 **Agroforestry health services.** SAG is responsible for agroforestry health action and, as a result of its efforts, Chile has attained a very adequate level of plant and animal health. SAG exercises surveillance in airports and at border points, runs a post-entry agricultural quarantine system, and maintains domestic checkpoints and laboratories designed to identify pests and diseases. It works closely with export associations to ensure the inspection of fruit before plant health certificates are issued. These procedures have been intensified as a result of the recent signing of the economic complementarity agreements with Argentina, especially Protocol No. 1 on "the transit of products of vegetable origin in hermetically sealed containers." The major health risk in these economic opening-up procedures stems from the presence of pests and diseases in neighboring countries.

F. Design and strategy of the program

- 2.19 Policy objectives. Current policy aims are to: foster and sustain the growth of sector output on a continuing basis with the expansion of domestic and external markets; manage the increase in productivity according to the criteria of environmental sustainability; seek a better and more equitable distribution of income by addressing rural poverty problems and increasing the productive capacity of small farmers and by achieving the institutional strengthening of public agencies.
- 2.20 Policy measures. The Chilean economic outlook would seem to be one of moderate medium-term growth, given the impact of fluctuating copper and oil prices. In order to prevent a significant decline it is necessary to offset the growth in exports with a high rate of

investment, but the role of the private sector in maintaining the investment level must be determined. In order to give sustained support to this effort, it is advisable to strengthen the generation of new technologies designed to augment efficiency and upgrade the productive sectors in the second stage of export development. The trend is toward a social market economy as regards allocation of productive resources, but the need to address the negative redistributive effects of that course is recognized.

- 2.21 In accordance with these government policies, INIA should reorient its programs to meet the requirements of small and medium-sized producers. The institute must therefore adapt to those new needs by streamlining its activities and research efforts. It is essential to attend to the technological needs of small farmers with a significant potential for increased production. The policy of supporting lower-income producers is also justified because the problems of rural poverty are concentrated in this subsector, so that any improvement in family income has a very favorable impact on the well-being of a sizable portion of the rural population.
- 2.22 A basic premise of the proposed program is that carefully executed agricultural research can be an efficient source of economic development and can help meet the objectives of national development. There is no doubt that research services should be expanded in order to meet those objectives. One of the groups benefiting from these investments in research and dissemination of findings would be low-income consumers, who typically spend a higher proportion of their income on food.
- 2.23 It is necessary to consolidate the export process and expand it to new products by supporting it with animal and plant health measures. This area has accordingly been given a high priority for public investments in the sector. It is necessary to protect the country's high health standards, support the amount of current investments, keep up quality and maintain the ability to respond to the requirements of importing countries. It is also necessary to take preventive steps in order to avoid damage to the environment stemming from pollution of the soil or of the final product. The benefits obtained depend on the country's health situation and on the organizational structure of official inspection and control of farms and marketing. Program activities as a whole will not affect the agricultural frontier, since the improvement of production systems and the intensification of production tend to maintain or reduce the amount of land in use.
- 2.24 The effort made both by the public and the private sector to improve agroforestry health has made it possible, through specific projects, to control and eradicate pests and diseases. This has tended to reduce losses, by making it easier to overcome international market constraints. The level attained calls for modernization of the present system and the stepping-up of efforts to lower the controllable levels of risk of introducing plant and

animal pests and diseases. The aims proposed would be achieved through the timely detection of pests or diseases by thorough plant and animal health monitoring, together with agricultural protection through in-transit control by means of strategically located barriers at borders, ports, airports and post-entry quarantine stations. This should be supplemented with immediate-analysis laboratories and with efforts supported by an information, communication and dissemination system.

- 2.25 It is also desirable to strengthen the sector with technical cooperation and training in order to obtain proper insight into the subsequent stages of development. The steps planned include new projects and the rehabilitation of irrigation districts; the strengthening of credit and technical assistance in INDAP; and environmental conservation and watershed management by means of integrated and multisector actions. The proposed program, in accordance with sector policies, would strengthen participating institutions through the integration of the physical and human resources necessary to further the generation and dissemination of technological know-how, as well as plant and animal health control and monitoring, and at the same time bring greater benefits to lower-income groups. This program, consisting of three subprograms and eleven components, has been designed with those ends in mind.

G. Evaluation of loans 506/OC-CH and 171/IC-CH

- 2.26 Loans 506/OC-CH and 171/IC-CH were approved on October 9, 1985 in the amounts of US\$3 million and US\$14,600,000. Disbursement of these loans was completed according to the original schedule (March 22, 1991) in the amounts of US\$2,933,743 and US\$13,065,604, respectively. These loans financed a program to strengthen research in and transfer of agricultural technology, the goals and objectives whereof were achieved in a satisfactory manner, with respect both to the generation and transfer of technology and to production support services.
- 2.27 The PCR prepared by the country office indicates that the agricultural sector generally responded positively to the policies addressed to it, so that levels of output initially considered "probable" and "optimistic" were surpassed in regard to wheat, barley, maize, sunflower seeds, rice, oats, potatoes and grapes. No crop failed to reach the initial output levels.
- 2.28 The PCR recommends that any new operation be directed at the following aims: (a) target the most backward sectors, in small producers; (b) strengthen the mechanisms for transferring technology to the small-producer sectors by employing proven means of communication consistent with socioeconomic reality; and (c) with respect to the INIA's shortfall, (i) identify the causes of the current shortfall and possible remedies for it, and (ii) introduce a financial accounting system that would produce a continuing flow

of data on the institute's actual condition. For more on this evaluation, see the copy of the PCR in the ENP/AGR files.

- 2.29 The proposed program seeks to take account of the experiences and recommendations previously mentioned in the PCR. Its primary aim is to redirect research and technology transfer toward the low-income sectors, i.e., small producers, that were previously not the direct beneficiaries.

### III. PROGRAM, COST AND FINANCING

#### A. General objectives

- 3.1 The program pursues the following objectives: (i) to bring about the modernization and institutional and operational strengthening of public services engaged in the assessment, control and inspection of animal and plant health; (ii) to help consolidate increased agricultural production by improving productivity, with emphasis on small farming; (iii) to further the protection and conservation of the environment and renewable natural resources; and (iv) gather and disseminate technical information and data on market behavior for the purpose of fine-tuning the State's policies, programs and projects.

#### B. The program: description and components

- 3.2 The program is made up of three subprograms, which in turn consist of the following components:
- a. Subprogram for Modernizing the Agricultural Health Protection System (SAG): (i) component for strengthening agricultural, livestock and forest health monitoring systems; (ii) component for strengthening agricultural quarantine systems and plant and animal health checkpoints; (iii) component for strengthening central and regional laboratories; and (iv) component for strength-ening support, health education and dissemination services.
  - b. Subprogram for Modernizing the Research and Technology Transfer System (INIA): (i) component for strengthening agricultural research; (ii) component for strengthening technology transfer; (iii) component for strengthening support services for research and transfer; and (iv) institutional modernization component.
  - c. Subprogram for Institutional Strengthening of the Research and Budget Division (DEP): (i) agroforestry information system; (ii) geographic information system, (SIG); and (iii) information systems development component.
- 3.3 A brief description of each subprogram and its components and sub-components follows:
- 1. Subprogram for modernizing the agroforestry health protection system (SAG)
- 3.4 This subprogram seeks to improve agricultural output by resolving plant and animal health problems and by eliminating obstacles that impede easy access to markets, especially those relating to agricultural products sold on the domestic and international markets.

To achieve these objectives, this subprogram is made up of the following four components:

a. Component for strengthening agricultural and forest health monitoring systems

- 3.5 This component is designed to maintain and increase health resources by strengthening the agroforestry health protection system operated by SAG, through the following subcomponents: (i) the agricultural and forest monitoring component seeks to expand agricultural monitoring and implement a new forest monitoring system based on the maintenance of continuing monitoring in cleared ports and border posts, pilot facilities and post-entry quarantine stations; (ii) the livestock monitoring subcomponent seeks to expand coverage of the current monitoring system through the compiling, processing and interpretation of epizootiological data, with a view to more efficient analysis of animal health problems, as well as planning, and the adoption of measures to prevent, control and eradicate diseases.

b. Component for strengthening agricultural quarantine systems and plant and animal health checkpoints

- 3.6 This component is aimed at strengthening and improving agricultural quarantine systems through entry quarantine infrastructure and equipment, and the monitoring of border posts, ports and airports. The component consists of three sub-components: (i) the agricultural quarantine is designed to detect and eliminate health problems in plant materials entering the country; (ii) the livestock quarantine sub-component is designed to immediately detect the presence of animal health problems or transmissible disease in animals entering the country; (iii) the plant and animal health checkpoints sub-component is designed to detect articles entering or moving about in the country which are dangerous to plantlife, as well as animals, products and subproducts not in compliance with the established regulations.

c. Component for strengthening central and regional laboratories

- 3.7 This component is designed to increase and modernize the diagnostic and analytic capacity of laboratories and to produce sterile flies for fruit-fly control, through the construction and equipment of central laboratories and the remodeling and expansion of regional laboratories. Its two sub-components are: (i) the agricultural laboratories subcomponent, which seeks to expand the diagnostic capacity and make the external trade system more flexible in matters related to imports of reproductive material, while the Sterile Fly Techniques Laboratory (TIE) is to deal with the fruit-fly problem, the eradication of that pest being essential in order to prevent Chile from being subject to health legislation prohibiting imports from countries where it is present; (ii) the livestock

laboratories subcomponent, which seeks to expand the coverage of diagnostic services, increase the efficiency of the units responsible in order to give timely support to monitoring efforts, and carry on with controls over veterinary biologicals and pharmaceuticals associated with the health mobilization.

d. Component for strengthening support, health education and dissemination services

- 3.8 This component supports SAG activities, especially those involving plant and animal health education, in order to secure the participation of producers and the community in general; maintenance of an expeditious system of information and communication for timely decision-making, especially at distant points such as checkpoints, summer pastures, rural properties, etc.; coordination of work with producer organizations, public institutions and neighboring countries; in-country training courses; international training; and the use of consultants for specific tasks. The component is divided into the following four sub-components: (i) health education and dissemination will seek to spur the active participation of producers in order to achieve an optimal health situation that will facilitate marketing and improve control efforts by SAG and public or private enterprises; (ii) information technology would seek to collect and process technical, administrative, financial and economic data useful for facilitating timely decision-making at the sectoral, regional and central levels, with a technical documentation center; (iii) communications seeks to facilitate expeditious and immediate contact among remote regions and places; and (iv) training, technical assistance and institutional coordination involves training that would benefit each of the subcomponents indicated.

e. Goods and services required for SAG subprogram

- 3.9 The subprogram provides for the execution and equipment of important projects, including: (i) the central agricultural laboratory, with entomology, bacteriology, mycology, nematology, virology, and weeds and seeds units; (ii) the central livestock laboratory, with departments devoted to the diagnosis of viral, bacterial and parasitic diseases, biological control, pharmaceuticals, chemicals and pollutants, pathology, facilities for the inoculation of large and small animals, and breeding facilities; (iii) administration and services; (iv) the agricultural quarantine station; and (v) the livestock quarantine station. Also provided for is the construction in Arica of the sterile-insects technique laboratory and civil works and improvements on regional agricultural laboratories in specific locations throughout the country, (see Map 1 and Annex III-12). In addition, eight control posts are planned. Included is the refurbishing of 10 checkpoints, which entails the installation of seven containers converted into offices and living space. The location of the checkpoints is shown on Map 2.



- 3.10 Investment in machinery and equipment has been provided for. The former includes a tractor and tools for the livestock quarantine station; the second includes equipment for central and regional laboratories and quarantine stations, equipment for plant and animal health checkpoints, particularly the purchase, installation and training for the management of three dual-screen type Z X-ray machines (two for Santiago International Airport and one for the Libertadores complex). Audiovisual aids, office equipment and furnishings would also be purchased, the last especially for the new facilities. The information technology sub-component would call for the purchase of a minicomputer, microcomputers, terminals, printers, modems and basic software. The communications sub-component would require 13 HF central exchanges, 56 HF fixed bases, 43 HF mobile units, 9 VHF (25 watts) and 28 VHF (5 watts) and their installation.
- 3.11 The strengthening of the activities requires the purchase of 91 additional vehicles, of which 54 are to replace old equipment, for field work, materials transport and the movement of staff from the central laboratories and quarantine stations. Of the total number of vehicles, 70% would be devoted to plant and animal health monitoring and 20% to tasks connected with the quarantine system. Laboratory inputs (biological, glass equipment, etc) would also be supplied, as would field inputs for sampling, identification of parasites, isolation boxes, aerosols, chemicals for disinfection, etc. Dissemination, training and computing materials would be provided. Also included for purchasing are books and subscriptions to technical journals.
- 3.12 Both external and local consultants would have to be recruited. Study grants abroad would focus on sending grantees to specialized laboratories or institutes as well as programs executed in other countries in collaboration with universities, specialized enterprises, consultants to be hired and SAG staff.
- 3.13 To ensure adequate execution of this subprogram, the SAG would require a total of 61 professionals, 67 technicians, 16 administrators and 34 auxiliaries. The incremental costs arising from the use of staff, vehicles, maintenance of investment, office supplies and printed material have been provided for. Also included are the amounts needed to contract for services relating to animal health monitoring surveys. ENP/AGR archives contain the list of equipment, inputs and goods required.
2. Subprogram for modernizing the research and technology transfer system (INIA)
- 3.14 This subprogram seeks to spur agroforestry productivity through the generation, adaptation and transfer of technology, with special emphasis on small farming; to strengthen and consolidate technology

transfer and the adjustments it requires; and foster to the protection and conservation of the environment and renewable natural resources as well as advanced research relevant thereto. The following four components were devised to pursue those objectives:

a. Component for strengthening agricultural research

- 3.15 This component would be aimed at: matching small farming with research efforts in accordance with the prevailing agroecological and socioeconomic conditions; developing research intended to maintain and improve the environment, as well as the regeneration of natural resources; conducting research aimed at reducing dependence on foreign technology; generating the experience necessary to develop advanced technologies; and helping to maintain and develop the country's scientific base. This component is in turn divided into the following three sub-components: (i) small farming systems, which would be designed to make technology appropriate to the socioeconomic conditions available to small farmers, in coordination with technology transfer efforts; (ii) environmental conservation, whose projects are aimed at disseminating knowledge about basic resources and limitations and developing technologies to protect natural resources; and (iii) technical innovation, training and organization, in which the projects to be executed are aimed at increasing technological know-how and reducing dependence on foreign sources as well as training, supervision and program coordination, the training of professionals and technicians, and the creation of a planning unit.

b. Component for strengthening technology transfer

- 3.16 This component's objectives are to adjust and validate the new production options to the specific prevailing agroecological and socioeconomic conditions in order to make those options available to farmers, professionals and technicians once they have proved to be economically viable, ecologically sustainable and socially acceptable. The component also attempts to establish an efficient information flow with the aim of incorporating the needs and circumstances of the farmers into the programs for generating technology and keeping the farmers, transfer workers and extension organizations properly informed of new technological options. This component is made up of the three following subcomponents: (i) technology transfer for small farmers will link small farmers to INIA's work, resulting in service to an estimated 98,000 small farmers as against the 25,600 currently reached by INIA; (ii) technological dissemination and development is designed to develop research in geographic areas with high technological demand which are currently not covered or require strengthening; and (iii) methodological appraisal of transfer is designed to develop and upgrade technological demand, identify technical and socio-economic constraints, measure effective technology adoption rates and conduct adaptational research.

c. Component for strengthening services to support research and transfer

- 3.17 This component would have the purpose of improving actions in support of the incremental effort, primarily strengthening laboratories, libraries, documentation services, communications, statistical analysis and computer systems. This component is divided into two subcomponents: (i) laboratories, designed to improve laboratory infrastructure and equipment nationwide, would emphasize the upgrading of chemical and physical analysis of soils and plants with their associated services, textile crops and dietetics; and (ii) support services would strengthen and modernize library, statistical, computing and communication services by means of projects including the organization of information technology, the strengthening of communication and information systems, production of publications, videos, etc., book purchases and library subscriptions.

d. Institutional modernization component

- 3.18 The object of this component would be to modernize the institute's operations by equipping and training the administrative staff so that they could work more efficiently. This component is divided into two sub-components: (i) modernization of research and transfer would improve substantive research and transfer activities by equipping and upgrading the infrastructure at various experimental stations and substations, and encouraging scientific exchange, external cooperation and short-term study grants for specific training as well as upgrade the structure and equipment of the experimental substations and fields through, e.g., administrative strengthening; and (ii) administrative modernization would buttress INIA's administrative work by strengthening the central administration; this sub-component would seek to rationalize operational and administrative functions as well as the programming and supervision of the proposed actions.

e. Goods and services required for the INIA subprogram

- 3.19 The subprogram provides for construction in each of the components, as follows: In the agricultural research component, works would be carried out primarily under the sub-component for research in small farming, in La Plantina (Hidango and La Cruz), Quilamapu and Remehue (La Pampa). The technology transfer component, dealing specifically in technological dissemination and development, would focus on the central office and Quilamapu. At the El Norte experimental station, construction would proceed at the Limarí, Illapel, Vallenar and Aysen substations. In the support services component, works would be executed at La Platina and Remehue. In the institutional modernization component, construction would proceed at La Platina (Los Tilos, Hidango), Quilamapu (Talca, Santa Rosa, Cauquenes), Carillanca and Remehue (La Pampa). See Map 3 for the location of stations and substations.

- 3.20 Provision has been made for investment in machinery and tools in connection with the procurement of 14 tractors and related equipment. Included are additional field, laboratory, and office equipment, computer hardware and software, audiovisual aids, furnishings, and communication and printing equipment. The ENP/AGR archives contain a tentative list of machinery, tools and equipment and their distribution, in accordance with needs by subcomponent and station.
- 3.21 Stepped-up activity would require the procurement of 182 working vehicles, of which 22 would be incremental and 160 would be replacement items. These (156 work vehicles, three buses and one truck) would be distributed over the period of execution in the research subcomponents in small farming, environmental research and small agriculture technology transfer.
- 3.22 The required inputs would be acquired for stepped-up laboratory work, materials for the introduction of technology adjustment and transfer centers (CATTs). These would be concentrated mainly in the agricultural research and technology transfer components. Animals would be required for the support service component, sub-components for small-farming research and innovation, training and organization. Book purchases and subscriptions to technical periodicals are also provided for.
- 3.23 Efforts on behalf of small farmers and the environment require staff training in field and laboratory work, economics and information technology, for which 45 study grants abroad - for Ph.D., master's and short-term programs - are provided. National and international consultants will be hired for specific tasks. The international consultants would in most cases come from institutions with which INIA has scientific ties.
- 3.24 The La Platina, Carillanca and Norte experimental station projects would sign agreements with the nation's universities, in order to take advantage of their infrastructure and the experience of the teaching staff. Also required is contracting for specific services for the projects to be carried out at the La Plantina and Quilamapu stations, such as surveys, soil grading, remote sensing in agriculture, etc. For the proper execution of this program, INIA will require additional staff.

3. Subprogram for institutional strengthening of the research and budget division (DEP)

- 3.25 The institutional strengthening of DEP is intended to modernize the system for compiling, processing and analyzing agricultural information and ensuring its appropriate dissemination based on the needs of public and private agents. The subprogram has three components, viz.:

a. Agroforestry information system component

- 3.26 This component would strengthen the agroforestry sector's capacity to generate, analyze and disseminate information in support of statistics research and sector policy studies and definition, and would make it possible to provide economic, productive and academic agents working in agriculture with more information, by: (i) creating a data base centralizing the data of institutions that generate sectoral statistics, in a system under which they could be updated, processed and disseminated to users; (ii) improving the capacity for the internal analysis of data, the design of economic and production forecasting models, and the development of methods for the periodic evaluation and monitoring of variables affecting the policies and actions of private agents; and (iii) redesigning the information dissemination system in order to optimize access to sector data.

b. Geographical information system component (SIG)

- 3.27 The SIG component provides a modern tool for the study of agricultural conditions. This tool makes it possible to relate, simulate and infer qualitative variables in a spatial setting. That component will lead to a significant improvement in the quality of the information used by the DEP and by other entities of MAG. The specific actions carried out under this component would: (i) set the SIG in motion and extend the use of this technology to the other institutions, and (ii) carry out pilot projects such as follow-up on wheat-growing (DEP), monitoring of forest operations (CONAF), fire control in tree plantations (CONAF), summer pasture control (SAG) 3/, and the study of rainfed and foothill areas (INIA).

c. Information technology component

- 3.28 The component's objective is to strengthen DEP with the technical and operational infrastructure necessary for the introduction, operation and development of computer systems intended to optimize the processing, preparation and dissemination of the information used at various levels of public and private decision-making. The component seeks to spur: (i) the establishment of a central data communications network encompassing all DEP units, and a regional network encompassing the 13 SEREMIS; (ii) the establishment of data base administration systems centrally managed by DEP and encompassing central and regional levels of aggregation and consolidation; and (iii) a strategy of investment in hardware and software based

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3/ Propuesta de Sistema Piloto para la Cartografía Nacional de Veranadas Cordilleranas y Ordenamiento de Empastadas [Proposed pilot system for the national mapping of mountain summer pastures and controlled use of grasslands]; DEP, Santiago, September 1991.

on the use of standards in the areas of operating systems, data bases, communications and user interface. 4/

d. Goods and services required for DEP subprogram

- 3.29 Provision is made for the procurement of computer equipment for the compiling and updating of data, for statistical studies and the dissemination of reports and publications, for telephone and fax communications, for the printing of publications and for office furnishings. A vehicle will be purchased for information-gathering, regional tours to conduct training in statistics management and follow-up on production and marketing activities. The necessary software is included for the operation of personal computers and related computer equipment. The purchase of specialized technical books and subscriptions to national and international periodicals is also provided for.
- 3.30 The training is designed to supply the necessary tools in areas relating to statistics and the economy. It includes training in advanced statistics: econometrics, statistical sampling and variance analysis and mathematical forecasting methods. This training will take the form of four- to six-month courses offered in Chile by the universities and by the OAS Inter-American Center for Statistical Studies.
- 3.31 Provision is made for the procurement of a central minicomputer server with high on-line graphics and processing capacity. In this manner the three stations will share one copy of the software (multiuser) and the data stored in the server. It is estimated that a 1.2 GB disk will be needed to store the mapping base (alpha-numeric data and environmental software). Operation of the SIG in multiuser mode makes it necessary to have a main memory of appropriate size in the server, estimated at 64 MB. The appropriate magnetic media are also required as information support and for massive data entry.
- 3.32 With respect to inputs, expenses are mainly for software and SIG information inputs, mapping, aerial photography, and satellite data and images. Subscription to an international data base covering remote sensing and geographical information is provided for. Consulting services and training will be specifically devoted to supporting the design, start-up and operation of the SIG and remote sensing technology. To this end, consulting services in areas supporting SIG design and start-up are provided, as well as the design and introduction of pilot systems.

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4/ See details in "Recomendaciones de Estandarización para Proyectos Informáticos del Ministerio de Agricultura" [Recommendations for standardization for information technology projects of the Ministry of Agriculture], preliminary version, Marcelo San Martín R., División de Estudios, DEP, Santiago, May 1991.

- 3.33 The component has defined two training levels: specialized and technical. The specialized level will be designed for the training of professionals in application and information, which will include data base design, procedures for analyzing remote sensing imagery, SIG model design and environmental control. The technical level, intended for practical training in the handling of certain computer and mapping tasks, covers techniques in classification, photo interpretation, spectral analysis, image processing and mapping.

C. Total cost and financing

- 3.34 The estimated total cost of the program is US\$61 million which is broken down in the following table, in accordance with the three subprograms.

TABLE OF COSTS (in thousands of US\$)				
CATEGORY	BANK	LOCAL CONTRIBUTION	TOTAL	%
1. <u>Engineering and administration</u>	-	788	788	1.3
SAG subprogram	-	477	477	-
INIA subprogram	-	90	90	-
DEP/MAG subprogram	-	221	221	-
2. <u>Direct costs</u>	24,727	4,277	29,004	47.6
SAG subprogram	13,346	2,217	15,563	-
INIA subprogram	9,681	1,463	11,144	-
DEP/MAG subprogram	1,700	597	2,297	-
3. <u>Recurrent costs</u>	518	13,398	13,907	22.8
SAG subprogram	123	5,947	6,070	-
INIA subprogram	193	6,224	6,417	-
DEP/MAG subprogram	-	1,218	1,218	-
Contingent technical cooperation	202	-	202	-
ATN/SF-3185-RE 5/	-	-	-	-
4. <u>Unallocated</u>	2,970	5,959	8,929	14.6
Contingencies	-	3,049	3,049	-
Cost escalation	2,970	2,910	5,880	-
5. <u>Financial costs</u>	285	8,087	8,372	13.7
Interest	-	7,729	7,729	-
Credit fee	-	358	358	-
Inspection and supervision	285	-	285	-
Total a/	28,500	32,500	61,000	100
Percentage	46.7	53.3	100	-
a/ The total estimated cost of the program does not include costs relating to tariffs and value added taxes.				

5/ The cost of this technical cooperation will be recovered by the Bank in accordance with established practice. See Recommendation 9, Appendix II.

D. Bank financing

- 3.35 To fund this program it is proposed that the Bank grant Chile a loan in the amount of US\$28.5 million equivalent, under the following conditions:

	OC Foreign currency
Amount	US\$28.5 million
Interest rate	Variable <u>6</u> /
Credit fee	0.75%
Terms: (i) Disbursement	5 years
(ii) Amortization	20 years
(iii) Grace period	5 years
Inspection and supervision fee	1%

- 3.36 The foreign currency will be used mainly to finance expenditures for construction, purchase of machinery and equipment, vehicles, inputs, publications and training programs.

E. Local counterpart

- 3.37 The local counterpart is estimated at US\$32.5 million equivalent. It will be used to finance engineering and administrative costs, part of the construction, maintenance and operation of machinery and vehicles, part of the inputs and all of the local and international consulting, as well as almost all associated costs, national training, interest on the loan and credit fee. This local counterpart amounts to 53.3% of total cost, which takes account of a special request by the borrower that, regardless of the matrix for Chile, IDB funding should be in an amount not exceeding 50% of total cost. 7/

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- 6/ The real interest rate will be the one in effect on the date of the respective resolution, variable during the disbursement period but fixed during the amortization period, pursuant to IDB regulations.
- 7/ Amounts for tariffs and value added tax (VAT) were estimated in the appropriate categories. Although these entries are covered in the annual budget of each body, they were not included as program costs.



#### IV. PROGRAM EXECUTION

##### A. Plan of execution

##### 1. Executing agencies

- 4.1 The executing agency of the program will be the Ministry of Agriculture, through the coordinating unit DEP, however each of the participating agencies will be responsible for the execution of their individual subprograms, that is, SAG, INIA and DEP.

##### 2. Coordinating unit

- 4.2 DEP, in its capacity as the Ministry's Division of Budgets and Studies and in charge of monitoring the institutions of the sector, will have the overall responsibility for the coordination of the program and act as a liaison with the Bank, in addition to being responsible for the execution of its own subprogram. The creation of this unit will be a condition precedent to the first disbursement. <sup>8/</sup> The Director of DEP will be nominated coordinator and will be supported by a professional with an assistant and auxiliary support for this purpose.

##### 3. Participating agencies

- 4.3 Each of the institutions will create a small executing unit. The creation of this unit will be a condition precedent to the first disbursement. <sup>9/</sup> In the case of SAG, the Director of the Planning and Budget department will be responsible for the coordination of the execution of their subprogram and will have a staff of two people (one of whom will be a professional) for administrative, accounting and reporting matters. In the case of INIA, the chief of the newly created Planning and Evaluation unit will be responsible for its respective subprogram; under him, a unit will be created which will consist of the same staff of two involved in the execution of INIA loan (506/OC-CH), that is, one agronomist and one administrative officer with a knowledge of accounting. This unit has acquired considerable experience and proved capable of carrying out these functions. Both, the Director of Planning of SAG, as well as the chief of the Planning and Evaluation unit of INIA, report directly to the Directors General of the institutions.
- 4.4 These units will be responsible for preparing the annual plans, budgets and activities, preparing separate financial statements for the subprograms, preparing all necessary reports to be transmitted to the Bank through DEP, monitoring the overall execution and performance of the subprograms, analyzing shortfalls in actual

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<sup>8/</sup> See paragraph 8(c)(i) of the proposed resolution in Appendix I.

<sup>9/</sup> See paragraph 9(c)(ii) of the proposed resolution in Appendix I.

execution as compared to the operating plans, and preparing disbursement requests to be forwarded directly to the Bank with a copy to DEP. Also, they will prepare and transmit all the necessary documentation for all acquisitions except vehicles and computer equipment, as mentioned earlier. All incoming documentation for the subprograms will be examined and approved by these units and no disbursements will be made without their approval. This will secure an adequate control making these units fully aware of the program activities at all times. Expenses, once approved, will be forwarded through the normal channels to the existing accounting departments for processing which through a separate accounting codification will be able to keep separate accounting records for their respective subprograms.

#### 4. Execution

##### a. Subprogram for modernizing the agroforestry health protection system

- 4.5 The Agricultural Service (SAG) would be responsible for execution of the subprogram. The following units report to the Director of SAG at the central level: the Office of the General Manager, the Programming and Studies Department, and the Advisory Units on Technical Extension, Legal Affairs and Telecommunications. The Departments of Agricultural Protection and Livestock Protection are responsible for execution, with each of them having responsibility for the protection, assessment and studies, laboratories and specific projects sections. Execution in the field is the responsibility of the regional offices, which are supervised by the national director and the sector chiefs.
- 4.6 In order to guide its activities, SAG, through the Department of Programming and Studies, prepares the medium-term action plan (five years), following the definition of specific projects and relevant support actions. This document covers the organization of the institution, the functions and responsibilities of the units constituting it and the responsibilities deriving from the programs executed. The annual action programming framework, which details the activities to be carried out at the central, regional and sectoral levels, is being prepared in conjunction with that plan, as are the requirements with respect to goods and services. The annual plan will be submitted to the IDB in the first sixty days of each calendar year, through the Program Coordinating Unit, with the assistance of the Public Health Board. <sup>10/</sup> SAG will be required to undertake, in coordination with the Public Health Institute, to continue supervising the analysis of biological products to screen them for veterinary use, and to prepare a manual of technical-analytic procedures to standardize the operation of the agricultural laboratories, both central and regional. To formalize

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<sup>10/</sup> See Recommendation 3, Appendix II.

control over veterinary biologicals, the relevant document is required for efficient operation of quarantine stations. Operating regulations would be drawn up along with the specified manuals for the laboratories. 11/

(i) Status of the designs

- 4.7 The final designs for the construction of laboratories and quarantine stations, which are the component's centerpiece, are ready in their entirety, that is to say, their dimensions (ground plans, frontages, cross sections and general layout), finishings and costs are known. Still to be completed would be the execution plans, which can be done in some six months of work by the Directorate of Architecture of the Ministry of Public Works. 12/

(ii) Site availability

- 4.8 The sites on which the buildings of the service would be constructed are the property of the institution, so that there is no problem regarding the physical initiation of work.

(iii) Works execution

- 4.9 Established Bank procedures will be used for awarding construction work contracts when they are partially or totally financed with loan resources in foreign currency. When funding is carried out in local currency, contracts will be subject to applicable national law.
- 4.10 Contracts for construction services, as well as the supervision of the construction and acceptance of the works, will also be a responsibility of the Architecture Directorate, through its engineers in each region, so that no problems are foreseen that might cause delays in terms of engineering or compliance with specifications.

b. Subprogram for modernizing the research and technology transfer system

- 4.11 The execution of this subprogram would be carried out by the central office of INIA and its experimental stations: La Platina, Quilamapu, Carillanca, Remehue, Kampenaike, Norte and Aysen. Each of the stations and substations would be responsible for completing the programs (24), projects (141), and experimental units, in accordance with the annual plans which they would submit for consideration by the coordinators of the national programs: research (22), technology transfer (3), and support (3), and these in turn of the general coordinators of research and technology transfer,

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11/ See Recommendation 5, Appendix II.

12/ See Recommendation 1(a), Appendix II.

for their approval and supervision, with the support of the planning unit to be established with the program. This annual plan will be submitted to the IDB in the first 60 days of each calendar year through the Program Coordinating Unit. 13/

- 4.12 The execution of the specific research and technology transfer projects, following the procedures indicated above, would be the responsibility of each of the research stations and substations. These would receive support, from the national coordinators and from the consultants provided for, most of whom would come from specialized institutions with which INIA maintains relations and scientific exchanges. Agreements providing for joint research or scientific support would be signed with universities.
- 4.13 INIA's research program staff would work in close cooperation, as regards the specific project in question, with the staff of the institute's technology transfer program. INIA would make the new alternatives available to farmers, professionals and technicians of the sector. These alternatives should be economically profitable and technically feasible. With respect to technology transfer, INIA would continue to expand its activities with medium-sized producers by forming technology transfer groups (GTTs) and by organizing talks, courses, demonstrations or adaptations of technology at the farm level, including formal training for extension agents.
- 4.14 The subprogram stresses the development of small producers through the introduction of technology adaptation and transfer centers (CATTs), in close cooperation with other public and private organizations, especially with INDAP, whose agreement establishes joint commissions in the service area of each CATT, grouping 10 to 15 farms. INIA's transfer staff would have the following duties: (i) to describe and assess the situation of small farming; (ii) to identify the supply of technology available; (iii) to transmit technological proposals to extension agents assigned to agricultural development, public or private, of the area; and (iv) to provide feedback to the research program regarding the level of acceptance of technology and any problems in that respect, so that the required adjustments can be made.
- 4.15 Firms of professional agricultural consultants offering extension services, through which INDAP executes its programs, and technical support consultants hired by INDAP to supervise those firms, would remain in close contact with INIA through the design of demonstration plots and the planning of annual training courses (technical analysis and evaluation meetings, field trips to CATTs or stations, courses and distribution of written and informative materials).

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13/ See Recommendation 3, Appendix II.

(i) Status of the designs

- 4.16 The executing agency already has the final designs as well as the technical material necessary to prepare the invitations to bid. With respect to the remodeling and installation of technical material for infrastructure, the executing agency will solicit bids in accordance with the laws of the country so that interested contractors may submit their technical and economic bids. The budgets prepared by the executing agency correspond to the quantities of work to be done, and to prevailing unit prices at the time of the analysis mission, for the regions in which the construction would be carried out.

(ii) Site availability

- 4.17 INIA has legal possession of 11 of the 17 sites where construction would be carried out. Formalities leading to legal possession by the institute in the six remaining sites is in an advanced stage and no problems in that regard are anticipated 14/

(iii) Works execution

- 4.18 The works to be undertaken will for the most part be subject to international public bidding, in accordance with established Bank practice for works funded in whole or in part with foreign currency under the loan, while those funded solely with counterpart funds will be subject to applicable national law.
- 4.19 The technical engineering and architecture support required during construction will be provided by the engineers currently working for the institute, with professionals in the region called in to fill special needs. Concerning the maintenance of the work to be carried out under the program, no expenditures are expected under that heading during the first year, and associated costs will begin to accrue during the second year. The cost of maintaining physical infrastructure during the years of execution have been entered in the financing table on that basis.

c. Subprogram for the institutional strengthening of the research and projects division (DEP)

- 4.20 This subprogram will be executed under the direction of the division chief, with the support of the division's present staff plus the two high-level consultants provided for. The process begins with the preparation of technical specifications for the purchase of computer equipment, including hardware and software, and the two vehicles, as well as office furnishings. Given the specialized nature of the computer equipment and based on documents prepared by

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14/ See Recommendation 1(b), Appendix II.

DEP itself, a standardized approach is possible, which facilitates the process.

- 4.21 The training of DEP staff, provided for in the proposed program, will make it possible to start up the required computer systems. However, the specialized firms providing the equipment have in-service training systems and mechanisms whereby this knowledge transfer process will be strengthened. Electrical and communication hookups for telephones, electronic information networks and transmission by modem with the SEREMIS will also be taken into account.

B. Bids

- 4.22 Procurement will be subject to the bidding procedures outlined in Annex B of the loan agreement.
- 4.23 The following categories will be used to simplify the procurement of machinery, inputs, equipment and vehicles: (i) field machinery and equipment; (ii) office equipment and furniture; (iii) laboratory equipment; (iv) vehicles; (v) audiovisual aids and related items; and (vi) laboratory supplies, reagents, chemicals and other biological articles. All bidding packages must include the appropriate parts and accessories. The entry into force of those grant regulations will be a contractual requirement. 15/

C. Recognition of previous costs

- 4.24 The borrower has requested the Bank to recognize the amounts referred to below as eligible for spending prior to approval of the proposed loan, in accordance with applicable policies of the Bank:
- a. INIA requests that it be allowed to charge approximately US\$150,000 to the loan for use in funding the purchase of certain items of equipment, subscriptions to periodicals and training abroad. 16/ INIA has requested that US\$350,000 equivalent be charged against the local counterpart funds for use in purchasing various items of equipment of local origin, subscriptions to periodicals, purchases of inputs, staff and operating costs, payments to consultants and training. 17/
  - b. SAG has requested that US\$100,000 equivalent be charged against the loan for investments in the execution of works, 15/ and that approximately US\$100,000 equivalent be charged against local counterpart funds for studies, plans, works and consultancy. 16/

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15/ See Recommendation 3, Appendix II.

16/ See Recommendation 2, Appendix II.

17/ See paragraph 8(e) of the proposed resolution in Appendix I.

D. Maintenance of works and equipment

- 4.25 The borrower, through each of the executing agencies, will include in the financing agreements an undertaking to the effect that works and equipment funded under the program will be operated and maintained in accordance with generally accepted technical standards and that the appropriate personnel and the necessary materials will be available for their efficient operation. In addition, the borrower will be required to submit to the Bank, throughout the execution of the program and until five years following its completion, a report on the maintenance carried out during the previous year. 18/

E. Disbursement schedule

- 4.26 In accordance with the investment schedule prepared for each of the subprograms and components, the following consolidated disbursement schedule is submitted for the program as a whole.

Disbursement schedule (in thousands of US\$)				
First year	IDB - OC	Local	Total	%
1	7,800	4,500	12,300	20.2
2	10,400	6,200	16,600	27.2
3	6,800	7,300	14,100	23.1
4	2,600	7,300	9,900	16.2
5	900	7,200	8,100	13.3
Total	25,500	32,500	61,000	100.0
%	46.7	53.3	100.0	

F. Fund transfers

- 4.27 The costs of each of the subprograms are clearly identified by each respective institution and by component. Disbursement requests therefore will be forwarded separately by each institution directly to the Bank. The funds will be channeled through the Central Bank to the Ministry of Finance, which will maintain separate accounts by institution so that the funds for each institution can be identified and transferred directly through its annual budget allotments. Similarly, the local counterpart funds will be allocated to each institution through their annual budget and identified separately. This methodology will allow a direct flow

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18/ See Recommendation 6, Appendix II.

of funds to each institution and a clear identification between the loan and the local counterpart allocations.

- 4.28 The contingent expenses budgeted for each subprogram and institution will be for the express use of that subprogram and institution only; no fund transfers of any type will be made between institutions without the express approval of the institutions, the Ministry of Finance and the Bank.

G. Natural disasters

- 4.29 In spite of the number and functional importance of building construction scheduled under the program, the structures are not very tall (no more than two floors). They may be regarded as simple structural designs that will pose no construction complications. In addition, when the architectural drawings for each building are prepared, an analysis of the soil beneath the building is done and each structural component is designed to be earthquake-resistant. Official building permits are granted for each building only when there is compliance with Chilean building construction codes. The codes have been drawn up to ensure the structural stability of buildings in the event of earth movements of similar intensity to the most destructive ones recorded thus far. Therefore, the proposed program does not call for additional measures to allow for such events.

H. Advance funding

- 4.30 To facilitate the execution of the program, the Bank could disburse up to 10 percent of the loan amount as an advance, thus enabling the executing agencies to cover the initial costs of the operation.

I. Ex post evaluation

- 4.31 The proposed evaluation to measure the impact of the program was reviewed with each of the executing units. The basic purpose of this exercise is to measure the ex post impact attained with investments financed out of IDB resources and compare the actual results with the ex ante goals. Information was requested from the SAG about the crop, livestock and forest health monitoring components in order to ascertain the national plant and animal health status. For the INIA, an analysis will be done of significant production technology, adjusted or developed during the first five years, for representative crops. An analytical description, drawing on typical cases of the relationships between the technology component at the CATT level and the impact thereof on the producers, has also been requested. Information has been requested at the central level about the impact of the program on the INIA management systems, with the main emphasis on resource allocation and the organization of the experimental stations. The DEP would prepare a detailed case study of the application of the Geographic Information System (SIG), wherein coordination with one of the



program-associated agencies will be identified. Suggestions will include control over a foot-and-mouth disease outbreak or support for an environmental research project employing remote sensing technology. (see normative documents, Appendix II, Recommendation A.7 describing the presentation of reports).

J. Accounting and audits

- 4.32 Financial statements for the program, throughout program execution, and those of SAG and INIA for five years following the date of the last disbursement, must be submitted annually to the Bank, audited by the Office of the Comptroller General of the Republic. 19/

K. Environmental aspects

- 4.33 The program is environmentally viable and should have a positive overall impact. The research, transfer and agroforestry health protection components would largely contribute to improving the environment. The environmental profile of this program was approved by the Environmental Management Committee at its meeting 6/91 of March 25, 1991, when it was assigned a category II rating. Paragraphs 6.14 to 6.16 set forth the program's environmental rationale.

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19/ See Recommendation 8, Appendix II.

## V. THE BORROWER AND THE EXECUTING AGENCY

### A. Ministry of Agriculture

- 5.1 The Ministry of Agriculture has the responsibility to coordinate all the activities in the agricultural sector; it is structured with a small nucleus at the top level, the "Subsecretaría", which includes an administrative unit, Legal and the Budget and Studies Division, with three centralized services (SAG, INDAP, CONAF), and one decentralized institution (INIA).
- 5.2 The budget allotted by the government for the agricultural public sector for fiscal year 1991 amounts to US\$107.5 million approximately, at January 1991 values, and it represents 1.3% of the total government budget. Of this, 3% is absorbed by the Ministry itself for its operations and for small transfers to other institutions and foundations (FIA, FUCOA, etc.); the remaining 97% is allotted to the other centralized and decentralized agricultural services and institutions.

### B. Budget and Studies Division (DEP)

#### 1. Organizational structure and objectives

- 5.3 DEP is a division integrated within the ministry's organizational structure without specific budget allotments but funded instead through the ministry's general budget fund and subject to the audit of the Auditor General. Its present functions are to monitor the budgets of all the institutions of the agricultural public sector, propose policies and projects, support and promote exports and collect and process data and information which are relevant towards the formulation of policies by the ministry authorities.
- 5.4 The proposed DEP subprogram will have a considerable impact on DEP's operations in terms of modernization of its equipment as well as the volume of information to be processed, which will upgrade the institution's capability and performance and give it a considerable increase of data and information for its studies and decision-making process. In addition, due to DEP's function as the sector's monitoring body, it will act as the coordinator for the execution of the entire program through a small coordinating unit to be created under the direct responsibility of the director of DEP (see chapter on execution).
- 5.5 DEP has a total of 59 people, of which 48% are professional, 13% technical, and the rest are administrative. Sixty-three percent of the personnel is employed by the Department of Studies and the rest is distributed equally among the remaining three departments. The proposed subprogram will increase DEP's personnel by six people or 10%. This increase will be permanent.

## 2. Budget and projections

- 5.6 DEP's budget is small in comparison to the ministry's overall budget, it represents only 0.9% of the sector's budget and about one third of the ministry's budget after all transfers of centralized and decentralized institutions are accounted for. The budget had a tendency to decrease and 1990 represents only 66% of the 1986 budget in real terms. 1991 displays a 12% increase over 1990 mostly due to investments in anticipation of the proposed project.
- 5.7 The first year of the project carries the highest expenditure because of the equipment purchases, 90% of which occur during that time. The second year shows a drastic reduction due to limited equipment purchases and years 4 and 5 are limited to contract services for the computer equipment.
- 5.8 The above projections assume that DEP's investments will be limited to those of the subprogram only, that is, no other investments will be made until the subprogram is fully executed. From the sixth year onwards, it is estimated that an investment level of US\$75,000 annually will be required for software and computer-related expenditures. Supplies and services will increase by 88% mainly due to computer equipment maintenance, and salaries will increase by 8% due to the additional staff of six people which are permanent. The coordinating unit will operate until the fifth year and will then cease operations. Total expenditures therefore, will increase by 15.5% in real terms over FY 1991. Considering, however, that the investment level for that year was abnormally high due to some PC purchases, DEP will require an increase of about 25% over its normal budget for its operations following the execution of its subprogram, which represents an increase of only 0.16% of the agricultural sector's budget.

### C. Servicio Agrícola Ganadero (SAG)

#### 1. Organizational structure and objectives

- 5.9 SAG is an agency that reports to the Ministry of Agriculture but has its own legal status and assets. Its basic objective is to contribute to the country's agroforestry development by protecting, maintaining and improving the health and sanitary conditions of animals and plants and their products, subproducts and derivatives.
- 5.10 SAG operates with headquarters in Santiago and has regional offices in all the 13 regions of the country. The institution is headed by a director who reports to the minister, and is composed of the following divisions: (i) Agricultural Protection Division; (ii) Livestock Protection Division; (iii) Renewable Natural Resources Division; (iv) Land Holding Division; and (v) Finance and Administration Division. In addition, it has the following support units: Internal Audit, Telecommunications, Program Planning,

Public Relations, Legal and Secretariat. The heads of all of the above units and divisions report directly to the director.

- 5.11 SAG operates through subprograms and projects. Each of the divisions is considered a subprogram. In addition, the Agricultural and the Livestock Divisions, which are the largest (56% of the total budget and 55.5% of the personnel), are subdivided into projects.

## 2. Budgets and financial administration

- 5.12 The budget is prepared at headquarters by the Program Planning Unit and is based on the previous year's activities plus or minus any new projects. Once the amount is approved by the Ministry of Finance, a detailed listing of activities by project is drawn up based on the man-years and funds allocated. The reports generated are detailed enough to permit good monitoring. Also, activities are monitored through random sample comparisons, audit visits and through the sector head in the field, who has to report the annual targets achieved.
- 5.13 The head of the Program Planning Unit will be responsible for the execution of the SAG subprogram assisted by two additional employees and his staff. The current system appears to be fairly good and functional and will continue for the proposed subprogram which will be amalgamated to it. Separate accounting records will be kept, however, during the execution period.
- 5.14 The Financial Administration Division includes Assets and Acquisitions, Personnel, Benefits and a Computer Unit. Adequate and detailed reports are available by location, as well as by program so that management and project leaders can control and monitor their operations.

## 3. Personnel

- 5.15 SAG's personnel totals 1,337, of which approximately 73% is in the field. Of the total, 55.4% is employed in agricultural and livestock activities, while only 6.7% is in RNR and Land Holdings. The above staff will be increased by an additional 178 people, or 13.3%, due to the proposed subprogram.

## 4. Financial aspects

### a. Rates

- 5.16 SAG has a fairly extensive rate and service fee system which is governed by legislation, through various laws, decrees, and resolutions. These decrees state that it is the director of SAG's responsibility to propose rates which will be applied for services rendered (certification, analysis, inspections, etc.) at the request of the user.

- 5.17 The present rate system is calculated on variable cost recovery by subprogram, excluding any activities totally unrelated to it. Inspection fees are based on standard hours required times a specified number of monthly tax units which automatically increases with inflation. The number of tax units is based on the total budget at a specific point in time. This means that, whereas increases account for inflation through the tax unit rate, any changes of the budget because of volume of increased expenditure is not accounted for, since the number of tax units remains fixed.
- 5.18 Increases in rates and fees, therefore, are not easy and always highly political. The last major change, however, was effective November 1, 1990, and it is beginning to have a very positive impact on SAG's revenues versus allotments.
- 5.19 The proposed program will not have a great impact on rates as it will not introduce any new ones; it will, however, increase total revenues due to an increase in the overall volume of operations which will be expanded. Its effect, therefore, on revenues will be approximately US\$300,000 in the fifth year of operation or 1.45% of the total projected revenues for 1997.

b. Revenues and expenditures

- 5.20 Revenues generated by SAG from rates, services and other sources, have jumped from 18% during 1986 to a projected 41% for 1991, thus reducing government allocations from 74% to the 48% budgeted for 1991. Other revenues represent mostly the premium paid by exporters for inspections done outside the normal operating hours. Thus, overtime is paid by the beneficiaries themselves. These revenues, in turn, can only be used by SAG for this very purpose.
- 5.21 Most of the budget is spent on salaries (58.5% for 1990) and operational supplies (26.3%). Investments in assets are very low, mostly in construction and improvement of field facilities. Fiscal year 1991 has an increased budget of US\$1.9 million in fixed assets or 10.2% of the total, which was in anticipation of the proposed program, and it finances certain items such as the inspection station at "Los Libertadores" and other construction works. SAG also transfers payments to farmers in the eastern areas for not using their land in order to create an area uninhabited by animals as a barrier against diseases. These payments have increased considerably as they are now paid for the entire season of January to April and October to December.
- 5.22 The largest percentage of the budget is consumed by the agricultural subprogram followed by the Directorate and the Administration. The Livestock subprogram is about half that of the agriculture subprograms, followed by the RNR and land holdings, which are very small. Expenditures were increased in 1987 (by 14%) in real US\$ and then dropped again in 1988 and remained fairly steady until 1990. Some of the fluctuations occurring within any

one year are due to emergencies where resources were shifted to tackle an identified problem.

## 5. Projections

- 5.23 The proposed subprogram will have a considerable effect on the institution's budget as it involves its most active divisions, that is, Livestock and Agriculture. It is assumed that no other investment will be made other than the proposed subprogram.
- 5.24 Operating revenues are increasing mainly because of the volume of operation. The last rate increase made its full impact in 1991, and no further increases or new rates are forecasted, volume, however, is expected to increase by 4% for 1993 and at a decreasing rate thereafter. The project is expected to have a marginal contribution in revenues attributed to increased volume.
- 5.25 The proposed subprogram itself has its biggest impact in the second year, with US\$8.6 million or an increase of 45% in an otherwise normal budget. The total budget of years 1996 and 1997 is almost equal, indicating that the last year of the project has little investment and it is mostly recurrent costs which are picked up by the budget allocations of 1997, which increase from US\$6.8 million to US\$8.7 million. Overall government budget allocations will drop from US\$11.1 million in 1986 to US\$9.1 million in 1991 to a projected US\$8.7 million in 1997 (or 42% of total revenues), while SAG-generated revenues will increase to 11.6 million to make up the difference of the projected US\$20.6 million expenditure budget required for 1997.
- 5.26 The biggest impact of the proposed subprogram will be with the Livestock Division followed by the Agricultural Division. Over the five-year execution period, the Livestock budget will be increased by about 58.5% and Agriculture by 28.1%.
- 5.27 The total expenditure increase in 1997 is 8.4% over FY 1991 or US\$1.6 million, which represents an increase of 1.58% of the agricultural sector's budget. Because of the high content of investment expenditures made by SAG in anticipation of this subprogram, its 1991 investment budget was higher than usual. Assuming, therefore, a normal investment level similar to FY 1990, incremental expenditures following the execution of the project will be US\$2.7 million, or 15.1% over FY 1991 budget.
- 5.28 Since the government's budget allocations, as mentioned earlier have decreased in both real dollars as well as percentage of total revenues, it means that these recurrent expense increases will be absorbed by SAG's operating revenues.

## 6. Audit

- 5.29 SAG is subject to both internal as well as external audits. Its internal audit program includes both financial as well as operation audits. As a government institution, SAG is also subject to the audit of the Auditor General of the Republic, who has two auditors permanently stationed within SAG exercising this function. The proposed project will be subject to both of the above audits for the period of its execution.

### D. Institute of Agricultural Research (INIA)

#### 1. Institutional structure

- 5.30 INIA was created in April 1964 as a nonprofit corporation. It has its headquarters in Santiago and it presently operates five principal experimental stations, as well as eight substations. The objective of INIA is to help increase crop and livestock production in the country through the creation, adaptation and transfer of technologies; and engage in research and studies in general, to better the use of agricultural resources.
- 5.31 The institution is governed by a board of directors presided by the Minister of Agriculture. The president of INIA is the top executive authority, under him the general manager is responsible for all the administrative and technical operations of INIA.
- 5.32 INIA operates under the program system. Each major activity is considered a program and each program is subdivided into projects and then activities. All programs are identified by major areas such as animal research, plant research, environmental research. There are 29 such programs, which are identified by specific item such as rice, fruit, etc. Each program has a national coordinator, whose responsibility is the technical performance and execution of the research activities throughout the experimental stations. The national coordinators report directly to the coordinator general at headquarters for all technical issues. Transfer of technology operates in the same manner.
- 5.33 INIA experienced a rather long period of transition since the new management took over in mid-1989. During that period, it operated without a defined organizational structure, which impaired the institution from operating smoothly and efficiently. Recently, however, and with the assistance of the Bank, INIA approved a new organizational structure and functions, which place more emphasis on regional participation in the decision-making process.
- 5.34 According to the new structure, under the general manager there are two support units, the External Relations Unit and the Program and Planning Unit. In addition, there are: the Coordinator General of Research, the Coordinator General of Transfer of Technology, which forms the operations area, and finally the Director of Finance and

the Department of Human Resources. The experimental stations report directly to the general manager. Also, six standing committees were created to discuss and decide technical and administrative problems.

- 5.35 The Planning and Programs unit is newly created and its functions are to plan all the technical activities of INIA, evaluate the results of the projects, propose new areas of action, study new projects and, in general, be INIA's short-and-long range technical planner. The total staff of this unit has been set at four, in addition to the coordinating unit for the proposed subprogram. A two-month consultancy is planned for this unit to assist in a planning methodology and strategy for the technical activities of the institution.

## 2. Personnel

- 5.36 The total personnel as of the first quarter of FY 1991 was 1,443, of which 822 or 57% were laborers and 231, or 16%, were professionals. The institution is very decentralized with only 3% of its total personnel at headquarters. La Platina has the largest concentration of personnel with 41.7% of the total and is situated in the Santiago area. In addition, there are about 500 part-time laborers who are employed during the high season.
- 5.37 INIA experienced a considerable personnel increase since the Bank's Stage I (506/OC-CH). Its total personnel increased from 1,150 during 1984 to 1,443 in 1990 (25%), of which 82 people was due to the Stage I financing. This increase is due to a great extent to personnel hired for certain fixed-term agreements and cooperations who become permanent at the end of their term.
- 5.38 INIA's skilled personnel has increased partly due to the Bank's first stage financing. The total number of Ph.D.'s and M.S.'s has increased from 67 in 1985 to 100 in 1990 or almost 50%. The staff is stable with low turnover, despite the top-level management and overall operative policies and changes. The proposed subprogram will result in a permanent increase of an additional 117 people, or 8.12%. Of these, 30 are professionals, 43 manual laborers and the remaining are administrative and auxiliary staff.

## 3. Budget and financial administration

- 5.39 INIA builds up its budget by activity and program, estimating first its total sales and variable production costs, thus applying any excess inflows towards research activities before determining its net requirements, which come in the form of government allotments. The records and systems it maintains are more than adequate for expenditure control; they are, however, inefficient for determining the true cost of its production, which generated 40% of its revenues for FY 1990. Compounding this problem are: (a) expenses common to all activities, including labor; and (b) common efforts



by researchers in both production and research where budgets for one activity may be used for another. To help solve the above problem, INIA created a new cost and marketing position whose function is to improve production cost information, as well as attempt to market INIA's research results.

- 5.40 The total personnel involved in all of the above functions is 13 and appears to be adequate. There are funds in the component that deals with administrative strengthening in this subprogram that will be used for the design and implementation of an improved cost system to assist INIA in determining more accurate production costs.

#### 4. Revenues and expenditures

- 5.41 INIA has seen considerable increases in self-generated revenues since 1985; these, however, have begun to fall and further reductions are forecasted for 1991 and 1992 to about 1985 levels. The increases were due to extra efforts placed on increasing revenues to offset increasing research costs, which were not completely funded by the government. Most of INIA's revenues are from: seeds (35%), milk (33%), and beef (8%); the remainder includes a variety of products such as fruit, wine, services, etc. A combination, however, of falling prices in milk, low demand for seeds as well as some volume reduction of both seed and beef resulted in a reduction of overall revenues, which was the major cause of a US\$1 million deficit for 1990. In addition, the present administration is trying to place more emphasis on research rather than production.
- 5.42 INIA attempted to reduce costs during 1991 in both personnel and operating costs; a general labor increase, however, which was unfunded by the government, offset these efforts, which together with further reduction in sales, services and contracts, generated an additional deficit, for a cumulative total of US\$1.8 million for FY 1991.
- 5.43 Even though INIA does not have a full costing system for its production, the examination of its records allowed us to conclude that: (a) it operates with a high fixed expense base; (b) it has a low variable labour cost; and (c) production activities result in positive operating margins. Since most production activities are very closely related to research, any reduction or elimination of any of them should be done selectively and after careful study.
- 5.44 INIA's personnel costs have increased considerably from 47% of its total budget during 1985 to 56% for 1991; operating costs, on the other hand, were reduced from 34% to 28% because of lack of funding. Research consumes 34.8% of the total budget, production 32.3%, transfer of technology 6.4%, and contracts and agreements 5.9%.

- 5.45 The government has not yet funded the total deficit to date and is in the process of studying cost reduction alternatives, including possible sale of assets. INIA has about US\$29 million worth of assets, of which US\$15 are in land and holdings and US\$2.1 in livestock.
- 5.46 INIA's present projections do not include any major cost-reduction programs other than a further decrease in self-generated revenues for 1992, followed by modest increases thereafter with modest decreases in personnel costs. If the government maintains the same level of budgetary allotments to INIA as in 1992 and no investment expenditures are made other than the subprogram, the modest expense reduction will result in constant deficits of US\$1.4 million until 1996, as shown in Annex V-5. For fiscal year 1997 the deficit will increase to US\$2.9 million which is composed of, US\$1.2 in incremental costs due to the project, US\$0.3 in capital expenditure which will have to be funded by the government (the total of which will represent an increase of 1.39% of the agricultural sector's budget) and the continuing operating deficit of US\$1.4 million.
- 5.47 The incremental funding therefore required by INIA for the next six years, in addition to the present budgetary allotments of US\$4.4 million is:

(in US\$ millions)							
	1992	1993	1994	1995	1996	1997	Total
Annual Deficit	1.5	1.4	1.4	1.4	1.4	1.4	8.5
Local Counterpart	2.5	2.8	2.6	2.0	1.8	-	11.7
Expenditure Increase	-	-	-	-	-	1.2	1.2
Investments	-	-	-	-	-	.3	1.3
Total	4.0	4.2	4.0	3.4	3.8	2.9	21.7

- 5.48 It is recommended, therefore, that: (a) the government provide adequate funds to cover INIA's present deficit; and (b) the institution present to the Bank's satisfaction a plan of action which reduces the projected deficit. 20/

#### 5. Audit

- 5.49 INIA has created an internal audit unit reporting directly to the president of the institution which will take over the inspection visits made by the headquarters Finance Directorate. INIA is also subject to the audit of the Auditor General of Chile, whose 1990 audit did not state any weaknesses in the institution's financial

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20/ See paragraph 8(d) of the proposed resolution in Appendix I and Recommendation 4, Appendix II.

controls. In addition, INIA as an autonomous entity is audited by an independent audit firm. The proposed subprogram will be subject to the same audit performed by the above organizations.

## VI. PROGRAM RATIONALE

### A. Technical rationale

- 6.1 Chile's potential growth is closely linked to the development of agricultural exports. Efforts to increase the volumes of agricultural exports would provide a stimulus to exporting farmers and, therefore, enhance the development prospects of the sector and of the economy in general. The inclusion of small agricultural producers in the export process is of paramount importance, for this group represents significant potential by virtue of its numbers and the level of development of its members.
- 6.2 The improvement and modernization of agricultural services, particularly those that by their nature further and support the processes under consideration, represent fully justified efforts in that they give rise to technologies and products which are expected to lower production costs, protect the resource base and have a greater impact on income distribution.
  1. Subprogram for modernizing the agroforestry health protection system (SAG)
- 6.3 As a result of the conceptual analysis of SAG components, in which strategies are established involving the participation of bodies such as INIA, INDAP, universities, private professionals and producers, the proposed strengthening is viewed as feasible from a technical standpoint. Recognizing the reduced technical facilities currently available to SAG, the analysis conducted on this subprogram has identified the existing constraints and made recommendations to overcome the problems and make their proper execution possible.
- 6.4 Despite its scanty resources, SAG has done useful work which the program would strengthen in such a way as to make health controls more effective and, should a plant or animal health emergency occur, ensure timely control of the problem, reducing the risk of its spreading and keeping costs down. The proposed investments in animal health monitoring would make it easier to keep the country free of hoof-and-mouth disease, African swine fever, Newcastle disease and highly pathogenic avian influenza viruses, as well as eradicating diseases such as classic swine fever, anthrax and infectious anemia, while controlling bovine brucellosis, tuberculosis and leukosis.
- 6.5 The infrastructure in central and regional laboratories, quarantine stations, checkpoints, support systems and training in specific fields would optimize resource use by allowing more efficient use of inputs, introducing an epidemiological monitoring system that would facilitate the timely detection of animal health problems by establishing the required preventive plans, supporting INIA's and

INDAP's technology transfer programs, improving herd management and helping to improve productivity and production coefficients. Support for efforts to control and prevent diseases that are transmissible to humans, such as brucellosis, tuberculosis and rabies, would make continued protection of human capital possible, especially human capital involved in the activities of the sub-sector.

- 6.6 SAG is familiar with the technical elements necessary for the subprogram and applies them efficiently. The country's central zone, which produces most of its fruit, is free of the fruit-fly problem (primarily the genus *Anastrepha* spp.). The subprogram is designed to maintain this prevailing state of plant health. Introduction of the sterile-insect technique and the strengthening of quarantine checkpoints will serve to keep this pest out of the zone and prevent outbreaks in the country. With respect to the bud-destroying moth [*polilla del brote*], which attacks pine trees, SAG conducts emergency campaigns involving plant health checkpoints and biological control systems (the parasite *Orgilus obscurator* feeds on the moth). SAG has also moved to keep the forest pest *Sirex noctilio* and the borer wasp [*avispa taladradora*] out of the country.

2. Subprogram for modernizing the research and technology transfer system (INIA)

- 6.7 The objectives of the subprogram are consistent with the national effort to give impetus to: (i) transfer of available technology, particularly to small farmers, by conducting research aimed at reducing production costs by creating exportable surpluses and combining sustainable land-use systems with the productive system in order to ensure proper use, management and conservation of renewable natural resources; (ii) development of new technologies based on advanced know-how, particularly with regard to the efficiency necessary to keep down costs.
- 6.8 Based on this aim of developing modern technologies conducive to higher productivity, lower costs and sustainable agriculture, the program has been structured into four components, 11 sub-components and 141 specific projects, which would orient and strengthen the actions initiated by INIA. Its execution would work to strengthen research and technology transfer in all projects and programs for which the institute is responsible, while the planned actions, including training, would serve to reaffirm the achievements of the previous program.
- 6.9 INIA maintains livestock research results and technology which require adaptation to the needs of small farmers. This calls for stepped-up effort in the northern areas of the country involving smaller species integrated with crops, by seeking the adaptation of higher-yield pasture, animal management and cross-breeding with more prolific breeds. In the central area, research in grasslands

rotation would make it possible to maintain soil potential and keep out of weeds and pests; the conservation of fodder and silage and the improvement of small dairy farms would resolve seasonal problems and raise productivity. Work relating to the introduction of legumes for animal feed and stocks of rhizobia, integrated with agricultural crops, would improve soils by reducing investment in fertilizers. Research into the improvement of grasslands, beef cattle, sheep and camelidae in the regions of the south require continuity in order to confirm its findings and support producers. More importance has to be given to the southern region, in view of the pressure exerted by sheep and cattle on the natural vegetation. This is underscored by the ecological conditions, the need to develop land for pasture from shrub cover and the gradual degradation of existing grazing lands.

### 3. Equipment of DEP

- 6.10 The proposed computer system was reviewed with the technical support of PRA/GCP. It is generally considered to be well suited to open system interconnection with regard to the operating system and brands. A universal protocol (TCP/IP) has been used which is compatible with the proposed infrastructure. The system would permit the addition of future components, which means reduced costs in relation to workload. The system design also benefited from previous standardization efforts mounted directly by DEP staff for software multiuser and multitasker applications. In general terms, the design has been described as adaptable to the desired standards, flexible and adequately configured for the future.
- 6.11 DEP's technical difficulties as regards the development of applications in connection with the data base and the SIG will be dealt with through the proposed consulting services. The availability of consulting resources (18% of operating costs) will be strengthened with fee payments (19% of those same costs), which come from local staff, at less cost than inter-national staff, but, given the country's existing conditions, are technically adequate. In the case of some firms that are providing hardware and software, technical support would also be available for in-service training of DEP staff assigned to operate them.
- 6.12 DEP staff has prepared an internal report 21/ establishing the basic ideas concerning the data base design. This report analyzes the unreliability of the present situation, both in DEP and in the SEREMIS. Among the serious difficulties noted are the fact that these agencies do not have their own equipment, the poor performance of the equipment currently in use, and the impossibility of

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21/ Recomendaciones para el Diseño de Sistemas de Administración de Base de Datos [Recommendations for the design of data base management systems], information technology development sub-component, DEP, Santiago, September 1991.

using modern applications. As part of the new design, the general layout of the network provides local and national links. It also includes a description of the way the market news system will be managed, based on its own statistics and the external trade system, which requires special preparation because of the large volume of information, users and consultations involved.

- 6.13 It is important to emphasize in general terms how great a contribution the technology of the SIG component would make. As an example, US\$ 6.3 million is devoted annually to fire control; it is expected that the efficiency of these resources would be improved with a more efficient and timely administration of the information. Furthermore, the management through SIG of information on the occurrence of fires would enable CONAF to improve the speed with which it could reach and control those fires. The annual loss of forest resources through fire has been estimated at some US\$25 million in terms of ecological damage, species extinction, loss of genetic material of flora and fauna, and the destruction of thousands of hectares of grazing lands.

B. Environmental rationale

- 6.14 The program provides for measures which would enhance the positive environmental effects. The subprogram for modernizing the research and technological transfer system provides for monitoring the use of resources aimed at improving production systems in a sustained manner; in accordance with the agroecological conditions and not restricted to individual products. Projects are included with the following aims: (i) to preserve and regenerate biotic resources that protect soils; (ii) to control extensive grazing by sheep, goats and cattle, by introducing varieties that adapt to the environment with better yields, in order to prevent soil erosion, through the introduction of higher-yield fodders and appropriate animal management practices; (iii) to diversify soil use in order to maintain its potential, through technical crop rotation and the introduction of legumes and other animal species that help conserve the resource; (iv) to plan for irrigation and water management on small properties; and (v) to rationalize the use of agricultural chemicals. The proposed research would also permit the development of higher-productivity crops and pastures without affecting the agricultural frontier.
- 6.15 Although export product control has been well established, the subprogram for modernizing the agroforestry health protection system would strengthen the control of pesticide residues on products for domestic consumption, thanks to the facilities that would be added. Pest and plant disease control would be significantly improved through the partial replacement of chemicals having potentially harmful effects on the environment with biological techniques which INIA is planning to develop. SAG would set up the sterile-insect techniques laboratory (TIE) designed to

irradiate, control, suppress and eradicate the fruit fly (principally the genus *Anastrepha spp.*). A regular duty of field staff would be to demonstrate the correct use of pesticides in order to minimize their effect on the environment.

- 6.16 The livestock and agricultural laboratories to be installed or expanded would, in the first case, introduce strict biological containment measures in order to prevent the escape of viruses or bacteria capable of producing diseases outside the work site. In the second case they would introduce adequate means of preventing the escape of biological and chemical agents that might have negative environmental effects outside the work site. The chemical and physical treatment of effluents and wastes from the quarantine station and laboratories are included in the projects designed to prevent pollution and ecological alteration of the environment in which they will be installed.

C. Institutional rationale

- 6.17 Each of the institutions involved in the execution of the program is the leading specialist in its field, and the activities of each subprogram are designed to be coordinated and amalgamated as an expansion of their overall operations. No organizational modifications were required by the institutions and no activities out of their field of specialty were added which would increase risk. In particular, INIA has already successfully executed IDB loan 506/OC-CH and its executing unit, mostly with the same staff, will carry on with this stage. The functions of DEP, as the monitoring branch of the ministry for the agricultural sector, make it the natural coordinator of the program, enhancing its abilities with the institutional strengthening component.

D. Financial rationale

1. Local counterpart

- 6.18 The program will require an average annual counterpart of US\$3.4 million in current dollars, excluding financial charges, which represents an increase of 3.1% over 1991 in the agricultural sector budget of US\$107.5 million, which in turn represents 1.3% of the total public sector expenditures. The government is expected to provide the entire counterpart to the executing agencies through their normal budgetary allotments.

2. Financial risks

- 6.19 The risks involved in the institutional-financial area are centered in INIA. The institution on one hand experienced a management change which, like every other, brings in new concepts and ideas. In addition, it operated for about two years without a defined organizational structure or defined responsibility levels for its middle management. Such transition should be carefully monitored



by both the executive management of INIA as well as the Bank, to avoid any possible bottlenecks in the initial stages of the subprogram.

- 6.20 On the other hand, INIA has a substantial deficit, a fact that was well known to the Ministry of Finance all along. Its solution is nevertheless still pending, as the latter is reluctant to finance it in its entirety, since it perceives that a similar deficit will not only continue in the future under the present level of activities, but will increase as a result of the project. Any solution involving a cost-reduction program will require a careful examination by the Bank, perhaps even a full analysis, to ensure that the integrity of the proposed program will be maintained.

### 3. Technical risks

- 6.21 The SAG subprogram is faced with the need to expand integration agreements with other countries, including, inter alia, the movement of agricultural products through their ports, especially fruits. This could increase the danger of introducing pests or diseases of which the country is currently free. It could also divert attention and both human and physical resources, to the detriment of the program. In addition, a reduction in the budgeted resources could weaken control of border points, especially as regards the movement of animals, the result of which could be problems similar to, or greater than, those previously faced.
- 6.22 One of the constraints that the INIA subprogram might encounter could be the time required for redirecting the work of the research staff when technology transfer is incorporated into the design and adjustment of research, through feedback resulting from dissemination. However, it is felt that INIA could adapt to this situation with relative ease.

### E. Economic rationale

#### 1. Subprogram for modernizing the agroforestry health protection system run by SAG

- 6.23 The objective of this subprogram is to maintain the national resource base at an appropriate level and to help increase it. It also seeks to prevent the deterioration that could be caused by reverting to the health levels of former years. The combined benefits of monitoring, protection, assessment and support are therefore analyzed in terms of the impact obtained in controlling major pests and diseases which could cause serious problems if they were introduced into Chile.
- 6.24 The base run prepared by SAG staff was used, with updates and adjustments in the new total investment and cost figures. The entire TIE laboratory investment was included, because the overall social impact is obtained with all costs. Brucellosis benefits

were also recalculated in accordance with a projection of the national herd and, with respect to the decline in pear trees, the impact of the loss of output was limited in order to recognize the possible application of measures additional to those provided for in this subprogram. By and large, the calculation of benefits corresponds to the production losses that a pest or disease can cause, plus the costs associated with their control.

- 6.25 Foreign currency discounting and adjustments for the use of unskilled manpower were used as factors in calculating social returns. Transfers through taxes and duties were excluded in investments and costs. Costs for the replacement of vehicles, inputs and equipment have been assumed in accordance with a normal replacement schedule for projections during the period additional to subprogram execution. Additional staff in the last year of the program was maintained for the entire 20-year projection horizon. The result of the base run of this subprogram indicates very favorable rate of return, with an EIRR of 78% equivalent to an NPV of US\$217 million, discounted to 12%. The result is very reliable and does not appear to be diminished by fluctuations in benefits or an increase in costs and investments.
- 6.26 Given the unpredictability with which outbreaks of these diseases occur, it was considered prudent to conduct a risk analysis, using the PROPLAN model and establishing parameters of occurrence with probability. The results confirmed this situation and better described the high values of benefits that are possible when the disease reaches high levels. The disease occurrence horizons used for this calculation fluctuated from the SAG base case to the lowest incidence and then the highest. This change was achieved by modifying the areas affected and the extent of prevalence, as well as the extent of the damage. The computer runs are available in the ENP/AGR archive.

2. Subprogram for modernizing the INIA research and technology transfer system

- 6.27 An analysis of economic viability was prepared by INIA using accepted procedures. The analysis was based on a statistical data base, with information on all crops in the zone served by each of the seven experimental stations, which made it possible to factor in the difference between the various geographic regions. Another important item for the analysis was the acreage devoted to different agricultural activities, the number of animals and current yields. The gross margins of return per hectare were calculated on the basis of the prices corresponding to the average value of the crop year at the farm level. This information enabled INIA to define two types of farmer beneficiaries, small farmers and business farmers.
- 6.28 The concept of a technology generation, transfer and adoption system is reflected in the technological packages recommended under

specific headings. Some recommendations entail only one change, but most of them entail several changes. For the economic analysis several degrees of acceptance of each technology were considered, and this was reflected in levels of adoption described as pessimistic, probable and optimistic. The rates of adoption as a direct response to the type of farmer and the conditions for carrying out the change were also reflected by using the concept of uncertainty regarding the change. Also used was the description of the change visualized by extension workers for each crop and each region, but in no case were coefficients representing full adoption used. The planned change is adjusted to the classic technology adoption curve by estimating the values of the projection for 20 years, with different formulas for the two types of farmers referred to above.

- 6.29 The subprogram's benefits relate total costs and investments to the sum total of the incremental gross margins for all crops. The benefits for small farmers were limited to the area served by INDAP and those for business farmers to direct coverage, with a coefficient of 10% and an indirect coverage of 75% but a correction factor of 40%. The costs of the various INIA research programs were also allocated to the area in proportion to each crop and each experimental station, as was the distribution of technology transfer, which was allocated in its totality to the small farmers. The analysis of the subprogram produced an acceptable rate of return in the pessimistic situation, which should be considered the base run with an EIRR of 40% and an NPV of US\$26.6 million discounted to 12%. These amounts remain positive and show an EIRR of 20% with the reduction of a quarter of the benefits and the same cost increase.

F. Distributional impact

- 6.30 This calculation takes into account the incremental gross margin taken directly by the small farmers under the INIA subprogram, plus the percentages of net benefits on holdings of small farmers deriving from savings in plant and animal health. Also factored in was the opportunity cost of payments to workers both in agricultural production tasks and in the replacement of tree plantations, as well as in the manpower involved in construction. These flows, discounted to 12% and added to the total of the INIA and SAG subprograms make it possible to estimate an index of distributional impact on low-income groups of 40%.

G. Women in development

- 6.31 The program will make it possible for country women to make better use of their work, especially at the small producer level. For example, women's participation is significant in live-stock health efforts to prevent animal diseases that might affect production, especially of milk, and to lower the risk of contracting diseases transmissible to humans, such as brucellosis and tuberculosis. It was found that in the area of agroindustrial activity, rural women

provided support to family industries by strengthening the capacity of the production unit. Furthermore, the project team learned that in credit activities involving small producers, INDAP requires full female participation, above all in horticulture, the raising of poultry, pigs or sheep, cottage industries, and other activities.

PROPOSED RESOLUTION 1/

CHILE. LOAN /OC-CH TO THE REPUBLICA DE CHILE  
(Agricultural Sector Modernization  
and Improvement Program)

The Board of Executives 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 Chile, as Borrower, for the purpose for granting it a loan to cooperate in the execution of an Agricultural Sector Modernization and Improvement Program, hereinafter called the "Program". This financing shall be subject substantially to the following conditions:

1. Amount and currencies: Up to US\$28,500,000, or the equivalent in other currencies, except that of Chile, which are part of the ordinary capital resources 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 currency or currencies specified by the Bank, in a quantity equivalent to the corresponding amount owed, calculated in units of account in terms of dollars of the United States of America, in accordance with provisions to be included in the loan contract.
2. Source of funds: The ordinary capital resources of the Bank.
3. Guarantee: The general responsibility of the Borrower.
4. Credit fee: 0.75% per annum on the undisbursed portion of the financing, commencing to accrue 60 days after the date of the contract and payable in dollars of the United States of America on the same dates as the interest.
5. Amortization: The Borrower shall amortize the loan in a period of 20 years from the date of the contract, by means of semi-annual, consecutive and, insofar as possible, equal installments. The first installment shall be paid 6 months

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

after the date scheduled for the last disbursement of the financing.

6. Interest: The Borrower shall pay interest semiannually on the daily outstanding balances of the loan. The first payment shall be made 6 months after the effective date of the loan contract. The Bank shall determine the rates of interest to be applied during the life of the loan, in accordance with the lending rate policy of the bank.
7. Disbursement: The term for disbursement of the financing shall expire 5 years after the effective date of the contract.
8. Special Conditions:
  - (a) The Program shall be executed and the resources of the loan shall be utilized in their entirety by the Borrower, through the Ministerio de Agricultura, hereinafter named "MAG" or "Executing Agency", in coordination with: (a) the Servicio Agrícola y Ganadero "SAG", with respect to the Subprogram for Modernization of the Forestry and Agricultural Sanitary Protection System; (b) the Instituto de Investigaciones Agropecuarias "INIA", with respect to the Subprogram for Modernization of the Research and Technology Transfer System; and (c) the Division de Estudios y Presupuesto of the Ministerio de Agricultura "DEP/MAG", with respect to the Subprogram for Institutional Strengthening of the DEP/MAG. If modifications in the legal provisions or the basic regulations of the MAG or in those concerning the SAG, the INIA or the DEP/MAG are approved which, in the opinion of the Bank, may substantially affect the Program, the Bank shall have the right to require the Borrower and the Executing Agency to provide explanatory and detailed information in order to determine whether such modification or modifications have or may have an adverse impact on the execution of the Program. Only after reviewing 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 financing of a Program, the total cost whereof is estimated at the equivalent of US\$61,000,000. Consequently, the loan contract shall contain such provisions as the Bank deems appropriate to ensure that such national resources as may be necessary, in addition to those of the loan, for the complete execution of the Program shall be duly provided, in an amount estimated at the equivalent of US\$32,500,000, 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 submit to the Bank evidence that, in accordance with terms previously agreed upon with the Bank: (i) it has established the Program coordinating unit in the DEP/MAG and has provided it with the necessary staff for coordinating the Program; (ii) the SAG and the INIA have established the executing units for the Subprograms under their responsibility and have provided them with the staff necessary for the execution of said Subprograms.
- (d) Prior to the first disbursement of the financing for the Subprogram of Modernization of the Research and Technology Transfer System, the Borrower, through the Executing Agency, shall submit to the satisfaction of the Bank: (i) evidence that INIA's budgetary deficit to December 1991 has been corrected; and (ii) an action plan, with its corresponding timetable of execution, to resolve INIA's operational deficit.
- (e) The resources of the financing may be used: (i) for up to the equivalent to US\$150,000, to finance expenditures incurred by the INIA in the execution of the Subprogram under its responsibility, for the procurement of equipment, the subscription to publications and the training of staff abroad; and (ii) for up to the equivalent of US\$100,000, to finance expenditures incurred by the SAG in the execution of the Subprogram under its responsibility, for the construction of works, provided that these expenditures as well as those indicated in paragraph (i) above, were made within the 12 months prior to the date of this Resolution, and provided that requirements substantially similar to those set forth in this Resolution and in the loan contract have been fulfilled.
- (f) In the acquisition of machinery, equipment and other materials for the Program and in awarding contracts for executing the works, 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 appended as an annex to the loan contract.
- (g) The Bank shall establish such inspection procedures as it deems necessary to ensure the satisfactory execution of the Program, and the Borrower, the Executing Agency, the SAG, the INIA and the DEP/MAG shall extend all cooperation which is required for the most effective accomplishment of this purpose. From the amount of the financing the sum of US\$285,000 shall be allocated for credit to the accounts of the Bank to meet expenses of general inspection and supervision.

9. Conditional Provision: The contract or contracts which are executed pursuant to the authorization conferred upon the terms of this Resolution shall enter into force only when the Board of Executive Directors has determined by means of Resolution that the Bank has sufficient resources available in its Ordinary Capital to cover the loan authorized by this Resolution.



RECOMMENDATIONS

- A. It is recommended that the following conditions, to be fulfilled to the satisfaction of the Bank, be included in the loan contract in addition to the conditions set forth in the proposed resolution:
1. Unless otherwise agreed upon by the parties, prior to issuing each call for public bids or, if there is no need for public bids, prior to the acquisition of the goods or the initiation of the works, the Borrower, through the Executing Agency, shall submit to the Bank: (a) the plans, specifications, budgets and other documents required for the acquisition or construction and, where appropriate, the specific bidding guidelines and other documents required for the call for bids; (b) in the case of works, evidence that it has the legal possession, easements or other rights to the land required for construction of the works.
  2. The Bank may recognize as expenditures chargeable to the local counterpart: (a) expenditures incurred by the INIA in the execution of the Subprogram under its responsibility for up to the equivalent of US\$350,000, for the procurement of equipment of national origin, the subscription to publications, the acquisition of inputs, personnel and operating costs and consulting services and staff training, ; (b) expenditures incurred by the SAG in the execution of the Subprogram under its responsibility for up to US\$100,000, for the contracting of consultants, the preparation of studies and plans, and the execution of works, provided that: (i) these expenditures as well as those indicated in subparagraph (a) above were incurred before the date of the Resolution but after October 15, 1990; (ii) requirements substantially similar to those set forth in the Resolution and in the loan contract have been fulfilled; and (iii) these expenditures are accepted by the Bank.
  3. Within the first 60 days of each calendar year, during the execution of the Program, the Borrower, through the Executing Agency, shall submit to the Bank, the annual programming of the Subprograms indicated in paragraph 2.01(a) and (b) of Appendix III, which shall include an evaluation of the execution of the same Subprograms corresponding to the previous year.

4. Prior to the granting of Program scholarships, the Borrower, through the Executing Agency, shall provide evidence to the Bank that the Program Scholarship Regulations, previously agreed upon with the Bank, have come into force.
5. Unless the parties agree otherwise, the INIA shall submit annually to the Borrower, for presentation to the Bank, financial statements that include the financial indicators previously agreed upon with the Bank, which indicate compliance with the plan of action and the timetable referred to in paragraph 8(d)(ii) of the Resolution. Notwithstanding, the first financial statement shall be submitted to the Bank 6 months after the date on which the plan and the timetable has been agreed upon with the Bank. After the presentation of this first report, the commitment and disbursement of the resources of the financing for the Subprogram of Modernization of the Research and Technology Transfer System shall be subject to the Borrower's compliance with the financial indicators previously agreed upon with the Bank.
6. Within 30 months from the effective date of the loan contract, the Borrower, through the Executing Agency, shall provide the following to the Bank: (a) evidence that the SAG continues to perform the analysis of biological products for veterinary use; and (b) the Manual of Analytical and Technical Procedures for the Agriculture and Livestock Laboratories, Central as well as Regionals, and the Operating Regulations for the Agriculture and Livestock Quarantine Stations that will be built under the Subprogram to be executed by the SAG.
7. The Borrower, through the Executing Agency, shall undertake: (a) that the works and equipment included in the Program shall be maintained and managed properly, pursuant to generally accepted technical standards; (b) to submit to the Bank from the termination of the first of the works of the Program and up to 5 years after the date of last disbursement of the financing, in the first quarter of each calendar year: (i) the annual maintenance plan for the works and equipment of the Program for that year; and (ii) a report on the status of the maintenance on those works and equipment, in accordance with Section VI of Appendix III. Should it be determined from the inspections performed by the Bank or the reports that it receives that the maintenance is below the levels agreed upon, the Borrower and Executing Agency shall adopt the necessary measures to fully correct any deficiencies.
8. For the "ex-post" evaluation of the Program, the Borrower, through the Executing Agency, shall submit the following:
  - (a) within three months from the date of the first disbursement of the financing, the methodology to be used for the preparation of the "ex-post" evaluation report, which shall include, at least, the items specified in Section VII of Appendix III;

- (b) within two years from the date of the first disbursement of the financing, a report on the progress made in applying the methodology referred to in paragraph (a) above; and
  - (c) one year from the date of the last disbursement of the financing, a final "ex-post" evaluation report.
- 9. The financial statements for the Program, during its execution, and those of the SAG and the INIA for up to five years after the date of the last disbursement of the financing, shall be provided each year to the Bank, certified by the Office of the Comptroller General of the Republic.
- 10. From resources of the financing, approximately US\$202,000 shall be used to cancel the amount owed to the Bank by the Borrower for the Technical Cooperation ATN/SF-3185-RE.
- B. The loan contract shall include an annex substantially similar in content to Appendix III of this document.

## THE PROGRAM

(Annex A of the Loan Contract)

### I. Objective

- 1.1 The objective of the program is: (a) the modernization and strengthening of the agricultural subsector to meet the needs of economic growth and increased exports; (b) the increase in the forestry and agriculture sanitary heritage by strengthening the plant and animal health protection system; (c) the increase of forestry and agriculture productivity, through generation, adaptation and transfer of technologies, with particular emphasis on rural agriculture; and (d) the strengthening of the agricultural sector's ability to generate, analyze and disseminate information.

### II. Description

- 2.1 To attain its objective, the Program shall have the following three Subprograms:
  - (a) Subprogram for Modernization of the Forestry and Agricultural Sanitary Protection System "SAG". The resources of this Subprogram shall be used to finance the components for the strengthening of: (i) the systems of agricultural, livestock and forestry sanitary surveillance; (ii) the agriculture and livestock quarantine and plant and animal health systems; (iii) the central and regional laboratories; (iv) the support, sanitary education and dissemination services, including studies to strengthen renewable material resources, among others.
  - (b) Subprogram for Modernization of the Research and Technology Transfer System "INIA". The resources of this Subprogram will be used to finance the components for the strengthening of: (i) agricultural research, aimed at solving the technological problems of the small agriculture, protecting the environment and generating state-of-the-art technologies; (ii) the transfer of technology generated by research, with emphasis on small farmers and on the expansion of this activity to agroecological priority areas where activities of research and technology transfer are needed; (iii) services in support of research and transfer of technology, through the strengthening of laboratories, libraries, communications, biometric and computer sciences; and (iv) institutional modernization through the improvement of buildings to facilitate research, scientific exchange, the granting of short-term scholarships, the modernization of planning systems, the execution and evaluation of proposed actions, and administrative and operational strengthening.

- (c) Subprogram for Institutional Strengthening of the División de Estudios y Presupuesto del Ministerio de Agricultura (DEP/MEG). The resources of this Subprogram shall be used to finance the following components: (i) the Forestry and Agriculture Information System, for compiling, processing and disseminating information to be used for the preparation of sector policies; (ii) the Geographical Information System; and (iii) the development of data processing.

### III. Cost and financing of the program

- 3.1 The total cost of the Program is estimated at the equivalent of US\$61,000,000, broken down as follows by categories of investment and sources of financing:

(Equivalent in thousands of US\$)				
<u>Categories of Investment</u>	<u>Bank</u>	<u>Local Contribution</u>	<u>Total</u>	<u>% Total</u>
1. <u>Engineering &amp; Administration</u>	-	<u>788</u>	<u>788</u>	<u>1.3</u>
Subprogram SAG	-	477	477	
Subprogram INIA	-	90	90	
Subprogram DEP/MAG	-	221	221	
2. <u>Direct Costs</u>	<u>24.727</u>	<u>4.277</u>	<u>29.004</u>	<u>47.6</u>
Subprogram SAG	13.346	2.217	15.563	
Subprogram INIA	9.681	1.463	11.144	
Subprogram DEP/MAG	1.700	597	2.297	
3. <u>Concurrent Costs</u>	<u>518</u>	<u>13.389</u>	<u>13.907</u>	<u>22.8</u>
Subprogram SAG	123	5.947	6.070	
Subprogram INIA	193	6.224	6.417	
Subprogram DEP/MAG	-	1.218	1.218	
Contingent Technical Cooperation ATN/SF-1385-RE	202	-	202	
4. <u>Unallocated</u>	<u>2.970</u>	<u>5.959</u>	<u>8.929</u>	<u>14.6</u>
Contingencies	-	3.049	3.049	
Cost Escalation	2.970	2.910	5.880	
5. <u>Financial Costs</u>	<u>285</u>	<u>8.087</u>	<u>8.372</u>	<u>13.7</u>
Interest	-	7.729	7.729	
Credit Fee	-	358	358	
Inspection and Supervision Fund	285	-	285	
TOTAL <u>1/</u>	28.500	32.500	61.000	100
Percentages	46,7	53,3	100	

1/ The estimated cost of the Program does not include the costs corresponding to tariff and value added tax.

IV. Procurement

- 4.1 When goods and services to be procured or contracted are to be financed in whole or in part with foreign exchange from the financing, the procedures and specific requirements for bids or other forms of procurement or contracting shall be such as to permit the unrestricted participation of goods and services from member countries of the Bank, including those concerned with any means of transport. Consequently, no conditions that would impede or restrict the offer of goods or the participation of contractors originating in such countries may be imposed through such procedures or specific requirements.

V. Consulting Services

- 5.1 With respect to consulting services financed with resources of the local counterpart, the Bank reserves the right to review and approve, before the SAG, the INIA or the DEP/MAG contract said services, the names and background of the selected consulting firms or individual consultants, their terms of reference and the fees agreed upon.

VI. Maintenance

- 6.1 The purpose of the maintenance shall be to preserve the works of the Program within a level compatible with the services they have to provide.
- 6.2 The first annual maintenance plan shall cover the fiscal year following the entry into operation of the first work of the Program.
- 6.3 The annual maintenance plan shall include: (i) details on the organization responsible for the maintenance and the personnel in charge of such maintenance; (ii) information on the funds to be invested in maintenance during the current year and the amount to be assigned in the budget for the following year.

VII. "Ex-Post" Evaluation

- 7.01 The "ex-post" evaluation report referred to in Recommendation 8(c) of Appendix II, shall include at least the following:

Subprogram for Modernization of the Forestry and Agriculture Sanitary Protection System

- 7.02 The information generated by the components of forestry, agriculture and livestock sanitary surveillance, that allows to learn about the national forestry, agriculture and livestock sanitary situation.

Subprogram for Modernization of the System of Research and Technology Transfer

- 7.03 An analysis of the technology of production with significant impact, generated or adjusted during the first five years of the Program, in the component of agriculture research. This analysis shall include the crops most representative of the regions under the influence of the Experimental Stations.
- 7.04 An analytical description of INIA's actions in the component of transfer of technology at the level of the Centers of Adjustment and Transfer of Technology (Centros de Ajuste y Transferencia de Tecnología (CATT)), and its impact on the farmers. The analytical description shall be carried out through the study of representative cases in the Experimental Stations.
- 7.05 An evaluation of the impact of the Program on the management systems of the INIA, to include the policy on assigning institutional resources, and the operational organization of the Experimental Stations.

Subprogram for Institutional Strengthening of the DEP/MAG

- 7.06 A case study on application of the Geographical Information System (Sistema de Información Geográfica, "SIG"). The case selected is to describe the coordination with one of the agencies participating in the Program, either the SAG or the INIA. That case study shall describe: (a) the scope of the training provided by the personnel of the DEP/MAG; (b) a description of the contributions of the DEP/MAG; (c) a description of the contributions from the participating agency; (d) an evaluation of the difference in cost compared to the traditional procedures; and (e) general recommendations on implementation of the SIG.

(Annex B of the Loan Contract)

TENDER PROCEDURES

(Agricultural Sector Modernization and Improvement Program)

I. APPLICABILITY

A. Amount and Types of Entities

- 1.01 These procedures shall be used by the Executing Agency <sup>1/</sup> in all procurement of goods and execution of works for the Project <sup>2/</sup> whenever the value of such goods or works 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.

B. Local Law

- 1.02 The Executing Agency may apply, as a supplement to the provisions of these Procedures, formal requirements or procedural details prescribed under local law and not included in these Procedures, when their application does not contravene basic bidding guarantees or relevant Bank policy. <sup>3/</sup>

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<sup>1/</sup> For purposes of these procedures, the term "Executing Agency" may also refer to the Borrower whenever the latter is in charge of bidding.

<sup>2/</sup> "Project" means the Project or Program for which the Financing has been extended.

<sup>3/</sup> Because these procedures are uniformly employed by the borrowing countries, and because bidding legislation varies from country to country in both form and detail, the rules and procedures established herein set forth only 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 publicly open bids, and so forth.



## II. GENERAL RULES

### A. Public International Bidding

- 2.01 The system of public international bidding shall be used whenever the acquisition of goods or the execution of works is to be partially or totally financed with foreign exchange from the Financing and the cost of such acquisition or execution exceeds the equivalent of two hundred thousand United States dollars (US\$200,000).
- 2.02 When foreign exchange from the Financing is to be used, the procedures and specific requirements for the bidding shall permit the unrestricted participation of bidders from member countries of the Bank. Consequently, no conditions that would limit or restrict the offer of goods and services, including those related to any mode of transport, or the participation of bidders from such countries, may be imposed.

### B. Public Bidding Which May Be Restricted Locally

- 2.03 The acquisition of goods or execution of works 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 Works or Procurement of Goods

- 2.04 Whenever the procurement of goods or the execution of works is financed exclusively by resources other than those of the Financing or of the Borrower <sup>4/</sup>, 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 Project and guarantee that both the cost of the goods or works 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 up to US\$200,000

- 2.05 The procurement of goods or the execution of works for amounts less than or equal to the equivalent of two hundred thousand United States dollars (US\$200,000), shall, as a general rule, be governed 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 reasonable price. Whenever foreign exchange from the Financing is to be utilized, the

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<sup>4/</sup> Such as resources from commercial banks, suppliers or other international financial institutions.

procedures employed shall permit, in addition, the participation of bidders for goods or services from the Bank's member countries.

E. Participants and Eligible Goods

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

1. Bidding Procedures for 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 constituted and in operation, in accordance with the laws of the member country in which the firm has its principal domicile;
- (b) that the firm have its principal place of business located in a member country;
- (c) that more than 50% of the firm's capital be owned by one or more persons or entities of one or more member countries or by citizens or bona fide residents of such eligible countries;
- (d) that the firm be an integral part of the economy of the member country where located;
- (e) 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 member countries or to legal entities that are not eligible in accordance with the nationality requirements set out in this section;
- (f) that in the case of a contract for the execution of works, not less than 80% of all persons who will perform services in the country where the construction is to be carried out, whether employed directly by the contractor or by a subcontractor, be citizens of a member country. In making this computation with respect to a firm from a country other than that in which the construction site is located, citizens or permanent residents of the country where the construction is to be carried out will not be counted; and
- (g) that 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 or bid forms.

2. Bidding Procedures for Goods

2.08 Only goods which originate in the Bank's member countries may be acquired. The term "country of origin" means:

- (a) that country in which the material or equipment has been mined, grown, produced, manufactured or processed; or
- (b) that country in which, through manufacturing, processing or assembly, another commercially recognized article results which differs substantially in its basic characteristics from any of its imported components. The nationality or country of origin of the firm that produces or sells the goods or equipment shall not be relevant to determine their origin.

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 from the country of the Executing Agency participate in public bidding, the Executing Agency may apply a national margin of preference in favor of such local suppliers. The following criteria shall be utilized:

- (a) A good 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 its total cost.
- (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: (i) import duties paid on significant raw materials or manufactured components, and (ii) local sales, consumption and value-added taxes incorporated into the cost of the item or items being offered. Proof of the amounts to be deducted under (i) and (ii) 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 this Contract.
- (d) In adjudicating bids, the Executing Agency may add a 15% margin of preference or the actual import duty, whichever is the lesser, 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 from 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 a bidding, such suppliers of goods are entitled to a regional margin of preference utilizing the following criteria:
  - (i) A good shall be considered to be of regional origin if it originates in a country that is a party to an integration agreement to which the country of the Executing Agency is also a party and if it complies with the standards governing origin and other matters relating to trade liberalization programs established in the respective integration agreements.
  - (ii) The local value added shall not be less than that stipulated for the national margin of preference.
  - (iii) In comparing foreign offers, the Executing Agency may add to the price of offers of 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. General Procurement Notice

##### 1. General Rule and Special Requirements

3.01 Except as the Bank may otherwise agree, every Project shall require the publication of a General Procurement Notice ("GPN"). This notice, which is intended to give interested parties timely notification of biddings for works or goods that may result from the Project, as well as to provide a tentative schedule for such biddings, shall include the following information:

- (a) name of the country;
- (b) reference to the Inter-American Development Bank loan;
- (c) name of the Project and amount and purpose of the loan;
- (d) brief description of each bidding or group of biddings that would take place as part of the Project, indicating in which quarter or half of the year each bidding is likely to take place;
- (e) brief description of the Bank's policy on publicity for specific biddings, with an indication of the type of publication to be used as well as other sources of information (embassies or others); and
- (f) name of the Executing Agency, its address, telephone and fax numbers at which interested parties may obtain additional information.

##### 2. Method of Publication

3.02 When the GPN is not in the process of being published or has not been published prior to the signature of this Contract, the Bank will arrange, on behalf of the Executing Agency, to have the GPN published, generally in the United Nations Journal "Development Business" or in another publication that the parties may agree on. For such purpose, the Executing Agency shall send to the Bank, for its review and publication, within 30 days from the effective date of this Contract, the text of the AGL to be published, following the requirements of paragraph 3.01, above. Once the final text has been agreed on, the Bank shall carry out its publication, which may be in any of the official languages of the Bank.

3. Subsequent Publication

- 3.03 When in the opinion of the Bank a substantial change or changes have taken place in the Project, the Executing Agency shall, at the request of the Bank, promptly send the Bank for its review and publication, the text for a new GPN, which shall reflect such changes. This GPN, which shall follow the requirements of paragraph 3.01 above, shall be published by the Bank once its definitive text has been agreed upon.
- 3.04 The Bank assumes no responsibility with respect to the Executing Agency or any other interested third parties, for lack of publication or late publication of GPNs.

B. Prequalification. Registration of Bidders

1. Applicability. General Rule

- 3.05 In bidding conducted for the execution of works, the Executing Agency shall utilize the system of prequalification or registration of bidders in the case of large or complex civil works. The Executing Agency may also use a system of prequalification or registration in bidding conducted for the procurement of goods, if deemed appropriate by such Agency.
- 3.06 Two-Envelope Procedure. 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 their judgment, circumstances render it advisable. 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 sealed envelopes containing the following:
- (a) 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 executed, ongoing contracts, current obligations and litigation.
- (b) Envelope 2 - the bid itself, with the respective price quotation.
- (i) 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 it shall be verified whether the bidders have included all documents required by the bidding specifications. If the envelopes do not contain the required documentation, that fact will be recorded in the minutes along with a description of the missing or incomplete information, and Envelopes No. 2 shall be returned unopened to those bidders

whose Envelopes No. 1 did not contain the required information. 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.

- (ii) Based on this information, prequalification of bidders shall take place within the periods set forth in the bidding documents. 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. In this second public ceremony, Envelopes No. 2 shall be returned unopened to the firms not prequalified. Once the representatives of the firms that did not prequalify have left the meeting, 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 most relevant details of the tenders shall be made in the minutes.
- (iii) The final evaluation of the proposals and the award shall be made within the time periods set forth in the bidding documents, and once the Bank has given its consent to the proceedings.

## 2. Registration of Bidders

- 3.07 No conditions which would impede or discourage the participation of foreign companies or violate the principle of bidder equality shall be established in the procedures for prequalification or registration of bidders. Registers shall be opened, whether for updating of registered firms' information or for the incorporation of new firms, on a frequent basis, and shall in any case be opened for each bidding to be financed with Project resources.

## 3. Term for Prequalification

- 3.08 The Executing Agency shall conclude the prequalification within a time period 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 Bank Approval of the Bidding Documents

- 3.09 The bidding documents, including the texts of 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 or

prequalification of prospective bidders. The bidding documents shall also comply with the provisions of paragraphs 3.22 through 3.29 herein.

b. Content of the Public Notice

- 3.10 The public notice of prequalification or registration of prospective bidders shall include, at a minimum, the following information:
- (a) general description of the Project and of the work which is the subject of the bidding, its site and its principal characteristics. In the case of bidding on goods, their description and special characteristics, if any;
  - (b) the proposed method of prequalification;
  - (c) approximate dates for issuance of the invitations to bid, opening of tenders, initiation of the works which are the subject of the bidding, and completion of construction;
  - (d) the fact that the Project is being partially financed by the Bank and that the procurement of goods or contracting for works covered by said Financing shall be subject to the provisions of this Loan Contract;
  - (e) the place, time and date at which firms may obtain the prequalification or registration forms agreed upon by the Executing Agency and the Bank, as well as the cost of these forms; and
  - (f) any other requirements for prequalification or participation in public bidding.

c. Publicity

- (a) Newspapers and Trade Journals. The public notice of prequalification or registration, and that of 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 period of at least three calendar days between each of the three publications of the notice. In the case of bidding for works the value of which is estimated to be above the equivalent of one million United States dollars (US\$1,000,000), the public notice of prequalification or registration and that of submission of bids, when there has been no prequalification, shall be published in two of the following publications:
  - (i) a well-known technical magazine;
  - (ii) the United Nations journal "Development Business"; or



- (iii) a newspaper with a large international circulation.
  - (b) In bidding for goods for amounts in excess of the equivalent of US\$200,000, the Executing Agency may opt to carry out international publicity exclusively in the journal "Development Business", or in the two following publications:
    - (i) a well-known technical magazine; and
    - (ii) a newspaper with a large international circulation.
  - (c) Embassies or other entities. The Executing Agency shall deliver copies of the notices of prequalification, registration or opening of bidding, as the case may be, to the embassies or, if there is no embassy, to the consulates of each of the Bank's member countries on the same date they are delivered to the press for publication. Whenever a member country advises the Bank of its desire to have such announcements sent to another entity instead of the respective embassy or consulate, the Bank shall so advise the Executing Agency and the Executing Agency shall send the announcements to the designated entity.
5. Content of the Prequalification or Registration Form
- 3.11 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 paragraph 2.07 herein <sup>5/</sup>;
  - (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 works similar to those which are the subject of the bidding;
  - (f) work under way or present obligations assumed by the firm;

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<sup>5/</sup> In the instances in which prequalification is conducted with respect to 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, pursuant to paragraph 2.08.

- (g) evidence that the firm has sufficient staff and equipment to satisfactorily carry out the works contemplated by the Project and an indication of where such staff and equipment are located; and
- (h) description, in broad terms, of the systems the firm would use to execute the works.

6. Deadline for Delivery of the Forms

- 3.12 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 bidding is restricted to the domestic market.

7. Selection of Prequalified Firms

a. Qualified Firms

- 3.13 Only firms that have demonstrated, pursuant to requirements set forth in the bidding documents or in the registration regulations, the necessary technical, financial, legal and administrative capacity to carry out the works may be prequalified or entered in the registry of bidders. Forms which are defective in form or which contain omissions or obvious errors may be accepted and corrections requested so long as said defects, omissions or errors do not relate to fundamental requirements, and so long as making such corrections does not alter the principle of equality among proponents.

b. Technical Report

- 3.14 The Executing Agency shall prepare a technical report on firms that presented themselves, indicating which were declared prequalified or duly qualified in the register and which were not, together with the grounds for such declarations. The report shall be sent to the Bank promptly for its approval or rejection.

c. Notification of Results

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

d. Later Disqualification

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

e. Duration of Eligibility

- 3.17 If one year has elapsed since prequalification or registration, and an invitation for bidding 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 originally provided. The new call shall meet the requirements established in these Procedures.

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 direct hiring of the contractor or supplier.
- (b) If, after the second call, there are not two or more firms that have qualified, 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 previously prequalified, if there was one.

g. Prequalification for Multiple Biddings

- 3.18
- (a) The Executing Agency may agree with the Bank to call for a single prequalification of contractors for a group of biddings when it is anticipated that, in a short period of time, several biddings for the construction of a group of similar works will take place and when, due to the geographical location of such works or other considerations acceptable to the Bank, such works may not be carried out through a single bidding.
  - (b) If so established by the bidding documents, contractors thus prequalified may participate in one or more of the scheduled biddings. In each invitation for bids, the Executing Agency may request that the bidders update information that may have changed since prequalification, and demonstrate that their capacity to execute the work continues to be that required by the bidding documents.
  - (c) The duration of the validity of prequalifications for a group of bids shall not exceed one year.

C. Bidding

1. Invitation to Bid

a. Following Prequalification

- 3.19 If prequalification has taken place, the Executing Agency shall send or deliver invitations to bid only to 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 3.10 c (Publicity) herein.

b. Without Prequalification

- 3.20 In the absence of prequalification, the invitation to bid shall be publicized as set forth in paragraph 3.10 c (Publicity) herein. The bidding documents shall clearly specify the minimum prerequisites which would qualify bidders to carry out the works or supply the goods involved. For this purpose, the documents shall include a questionnaire similar in content to the form specified in paragraph 3.11 of this Chapter, which is to be filled out by interested parties and submitted by them along with their respective offers.

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

- 3.21 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 Project, purpose of the bidding and source of funds destined to finance the cost of the procurement of goods or works;
  - (b) the fact that the Project shall be partially financed by the Bank and that the procurement of goods or contracting of works 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 works, 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 handed in and the authority responsible for their approval and adjudication; 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

- 3.22 The bidding documents (bidding guidelines or specifications) including, *inter alia*, instructions to bidders, administrative bases, plans and specifications, if any, and the draft of the contract, shall be approved by the Bank prior to their release to interested parties.

b. Clarity of the Documents

- 3.23 The bidding documents prepared by the Executing Agency shall be clear and coherent. Particular care must be taken to ensure that the goods or works to be supplied are described with sufficient clarity and in sufficient detail. The cost of such documents must be reasonable.

c. Free Access to the Executing Agency

- 3.24 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 made available to the other interested parties and the Bank.

d. Standards of Quality

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

e. Specifications for Equipment: Brand Names

- 3.26 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 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 performance and quality equal to those specified. In special cases, with the prior approval of the Bank, specifications may require that a proprietary item be supplied.

f. Currency Clause

- 3.27 The bidding documents should state the currency or currencies to be used in payment, in accordance with the provisions of this Contract. Whenever expenditures in both local currency and foreign currency are involved, the bidding documents should require that the amounts of these expenditures be detailed separately in the bids.

g. Bid Bonds

- 3.28 Bid bonds or other tender guarantees should not be set so high <sup>6/</sup>, nor their validity stretched out over such long periods, as to discourage responsible bidders from tendering. Bid bonds shall be returned to the winning party once the contract is executed and the party's performance bond or guarantee has been accepted. Bid bonds shall be returned to the second- and third-place bidders, within a period 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. However, if such bidders indicate lack of interest, the bond shall be returned within five days following the award. Bid bonds shall be returned to other bidders within five days following the award.

h. Performance Guarantees

- 3.29 Specifications for construction works should require performance bonds or other forms of surety to guarantee that works will be carried out 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 Executing Agency 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 other forms of surety may be required in connection with

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<sup>6/</sup> 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.

contracts for the supply of equipment. This surety may consist in the retention of a percentage of the total payment during a warranty period.

4. Deadlines for Submission of Bids

a. Normal Term

- 3.30 The normal deadline for filing offers in international public bidding shall be not less than 45 calendar days from the date of the last publication of the notice of bidding or the date of availability of bidding documents, whichever is later.

b. Term for Large Civil Works

- 3.31 Where large or complex civil works are involved, a minimum of 90 calendar days shall be allowed for contractors to submit their bids.

c. Deadline for Filing of Domestic Bids

- 3.32 When the bidding is limited to the domestic market, the Executing Agency may reduce the deadline for filing offers to a period of 30 calendar days.

5. Confidentiality of Bidding and Prequalification Documents

- 3.33 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 the day scheduled for their opening. Once opened, no copies shall be made of the documents in the envelopes. Except as the law may require to the contrary, after the public opening of bids and reading of the price, and before the announcement of the contract award to the successful bidder, information relating to the examination, tabulation, clarification and evaluation of bids or relating to recommendations concerning awards, may be communicated only to those officials of the Executing Agency who are officially involved in the respective bidding process.

6. Modification or Amplification of the Bidding Documents

- 3.34 Any modification or amplification of the bidding guidelines or 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 amplification is substantial, in the opinion of either 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 Shall not Modify Bidding Documents

- 3.35 Consultations regarding 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

- 3.36 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

- 3.37 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 minutes of the proceedings, which shall be signed by the representative of the Executing Agency and by any bidders present who wish to do so.

10. Clarification of Bids

- 3.38 The Executing Agency may request clarifications from the bidders with respect to their offers. 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

- 3.39 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

- 3.40 In addition to the bid price, adjusted to correct arithmetical errors, the Executing Agency may also consider other relevant factors in determining the lowest evaluated bid.
- (a) These factors should, to the extent possible, be expressed in monetary terms or be given a relative weight. In any case the factors, along with the weight assigned each of them, must be specified in the bidding documents. No criteria may be used in bid evaluation which are not set forth, along with their corresponding value, in the bidding documents. The amount of price readjustments, if any, included in the bids should not be taken into consideration.
- (b) The currency or currencies in which the price offered in each bid would be paid by the Executing 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

- 3.41 The Executing Agency shall reject all bids that do not comply with the bidding documents. It may, however, accept those that present defects in form, omissions or obvious errors, so long as these defects do not relate to fundamental requirements and so long as their correction does not alter the principle of equality among bidders. The Executing Agency, may, after consultation with the Bank, reject all bids presented if none of them satisfies the intent of the bidding, or where there is evidence of lack of competition or collusion. The Executing Agency may also reject all bids if the low bids exceed the official estimate by amounts 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% performance bond, the Executing Agency may reject individual bids 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 goods within the specified time and according to the conditions stipulated.

12. Bid Evaluation Report

- 3.42 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 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 these Procedures, 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, unless the inconsistencies giving rise to the Bank's objections can be corrected. The Bank may cancel an amount of the Financing which, in the Bank's opinion, represents the amount of expenditures declared ineligible.

13. Award of Contract

a. Bank Approval

- 3.43 The award shall be made to the bidder whose bid has been determined to be the lowest evaluated bid and in conformity with the bidding documents, once the Bank has approved the corresponding notice of award.

b. Award Notification and Contract Signature

- 3.44 The Executing Agency shall promptly notify all bidders of the award, at the addresses they have provided, within three working days from the date of the award. It shall promptly send to the Bank, for its approval, a copy of the draft 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 and the Executing Agency shall promptly send a copy of the signed contract to the Bank.

14. Modification of the Award

- 3.45 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 other bidders in the order in which they have been evaluated.

15. Bidding Declared Null and Void

a. Report to the Bank

- 3.46 Whenever the Executing Agency has reasonable grounds for declaring the bidding null and void, it shall request prior approval from 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

- 3.47 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 carried out under these Procedures must guarantee the legal protection of bidders, permitting the proper remedies of review to guarantee such protection.
- 4.02 The Executing Agency shall not impose conditions which would impede, restrict or increase the cost of submission of protests by firms participating in bidding for the acquisition of goods or execution of works with resources of the Project.
- 4.03 The Executing Agency shall notify the Bank promptly of any protest or claim lodged in writing by 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 acquisition of goods or contracting for works with respect to which, in the Bank's opinion, there has been noncompliance with the provisions set forth in these Procedures.

# C H I L E

## OPERATIONS PROGRAM WITH CHILE: 1991-1993

<u>PROJECT No.</u>	<u>NAME</u>	<u>AMOUNT</u> (US\$ millions)	<u>TOTAL</u>
I. 1991			
CH-0044	Investment sector	150.0	
CH-0051	Functional and physical rationalization of health services	70.0	
CH-0034	Global preinvestment	<u>10.0</u>	
	<b>TOTAL 1991</b>		230.0
II. 1992			
CH-0022	Science and technology	94.0	
CH-0024	Employment training	56.0	
CH-0027	Modernization and improvement of public agriculture sector	28.5	
CH-0032	Sites and services	105.0	
CH-0036	Management of critical watersheds	50.0	
CH-0033	Credit for microenterprise	14.0	
CH-0029	Urban roads III	90.0	
CH-0037	Water supply and sewerage in urban and rural areas	<u>100.0</u>	
	<b>TOTAL 1992</b>		537.5
III. 1993			
CH-0040	IDB-CORFO IV Multisector credit	360.0	
CH-0031	Decontamination of effluents and mining diversification - ENAMI	40.0	
(n/n)	Highway improvement III - IDB - IBRD	250.0	
CH-0004	Local development multiple investment III	210.0	
CH-0039	National program for efficiency in health care services	<u>120.0</u>	
	<b>TOTAL 1993</b>		<u>980.0</u>
	<b>TOTAL 1991 - 1993</b>		<u>1,747.5</u>