

# CHILE

by Ministerio de Fomento,  
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## 1. Physical environment and communications

Chile is a country of extremes. Although of approximately the same area as Bolivia or Venezuela, Chile is distinguished by its great length, over 4,000 km from north to south, while its average width is less than 200 km. The total area is 741,767 km<sup>2</sup>; a further area of 1,250,000 km<sup>2</sup> is claimed in Antarctica. Only 22 per cent of the country can be classified as flat or gently sloping land. Hills, with moderate to steep slopes, account for a further 24 per cent and rugged mountains for the remaining 54 per cent. From west to east lie three narrow major relief components, the Coastal Range, the Central Valley and the high Andes. All three features diminish progressively in altitude southwards and in addition, beyond Llanquihue, the Andean range becomes discontinuous, the Central Depression largely submerged and the Coastal Range

AVERAGE ALTITUDE OF MAJOR RELIEF REGIONS

Region	Coastal Range	Central Valley	Andes
North . . . . .	2,000m	600m	6,000m
Centre . . . . .	1,500m	400m	5,400m
South . . . . .	1,000m	100m	4,000m

a farrago of islands. The continuity of the Central Depression is interrupted by a number of broken ridges linking the Andes and the Coastal Range.

The structural pattern upon which these physiographical regions rest is that of the Andean Cordillera, a central belt of high basins and a precipitous, dissected coastal plateau block. The Central Valley is not a continuous depression but

AVERAGE RAINFALL AT SELECTED STATIONS

Region (1)	Province	Station	Annual rainfall mm	January mm	July mm
Desert	Tarapacá . . . . .	Iquique . . . . .	2.5	0.1	0.8
Semi-desert	Coquimbo . . . . .	La Serena . . . . .	114.4	0.1	21.9
North Mediterranean	Santiago . . . . .	Santiago . . . . .	359.2	1.6	77.2
South Mediterranean	Bío-Bío . . . . .	Los Angeles . . . . .	1,310.9	18.5	215.1
Forest	Valdivia . . . . .	Valdivia . . . . .	2,511.0	63.5	378.6
Archipelago	Aisén . . . . .	San Pedro . . . . .	4,319.0	375.8	392.5
Atlantic	Magallanes . . . . .	Punta Arenas . . . . .	431.4	32.7	41.0

Source: W. Weischet, Chile, Geographisches Taschenbuch, 1960-61.

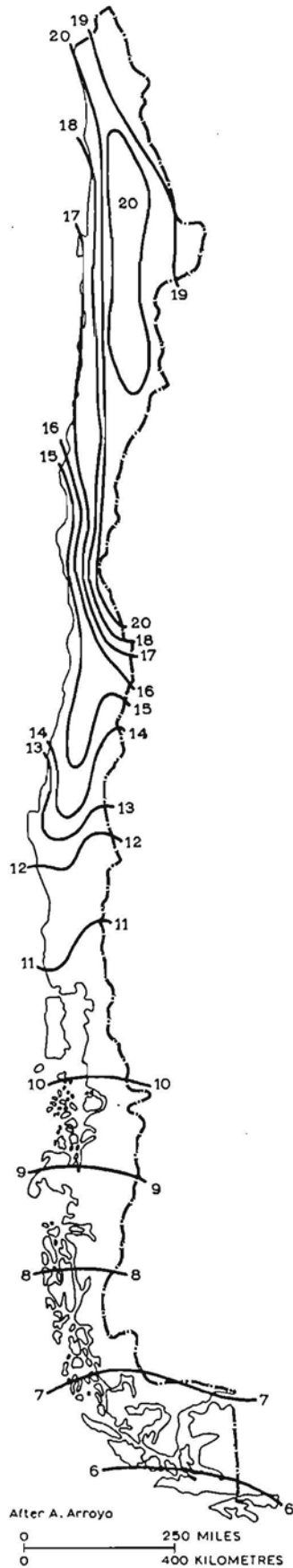
AVERAGE TEMPERATURES AT SELECTED STATIONS

Region	Province	Station	Annual °C	January °C	July °C
Desert	Tarapacá . . . . .	Iquique . . . . .	18.3	21.3	15.6
Semi-desert	Coquimbo . . . . .	Coquimbo . . . . .	14.8	17.7	12.1
North Mediterranean	Santiago . . . . .	Santiago . . . . .	13.9	19.9	8.0
South Mediterranean	Bío-Bío . . . . .	Los Angeles . . . . .	13.5	19.3	8.5
Forest	Valdivia . . . . .	Valdivia . . . . .	11.8	16.7	7.8
Archipelago	Aisén . . . . .	Puerto Aisén . . . . .	8.9	13.1	4.8
Atlantic	Magallanes . . . . .	Punta Arenas . . . . .	6.6	10.9	2.2

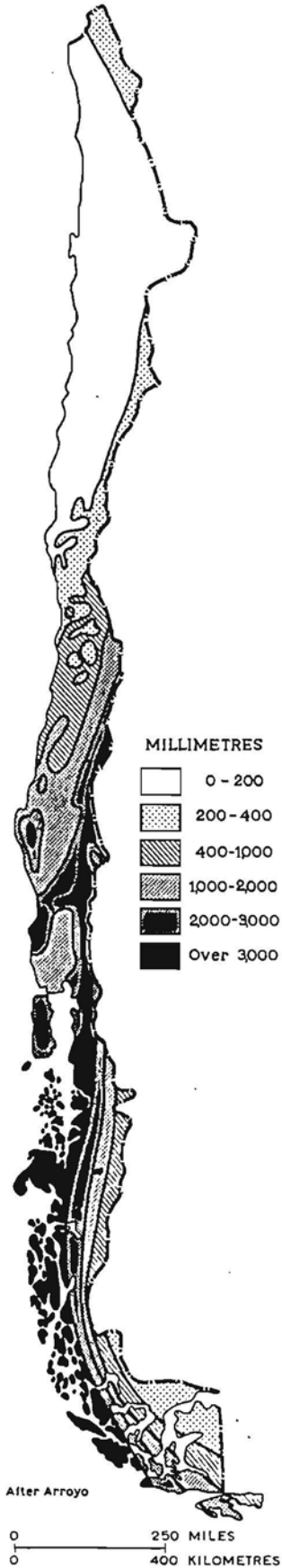
Source: W. Weischet, Chile, Geographisches Taschenbuch, 1960-61.

(1) In this and subsequent tables the regions or zones comprise the following provinces: 1) Desert: Tarapacá and Antofagasta; 2) Semi-desert: Atacama and Coquimbo; 3) North Mediterranean: Aconcagua, Valparaíso, Santiago, O'Higgins, Colchagua, Curicó, Talca, Maule, Linares, and Nuble; 4) South Mediterranean: Concepción, Bío-Bío, Arauco, Malleco and Cautín; 5) Forest: Valdivia, Osorno, Llanquihue; 6) Archipelagic: Chiloé and Aisén; 7) Atlantic: Magallanes.

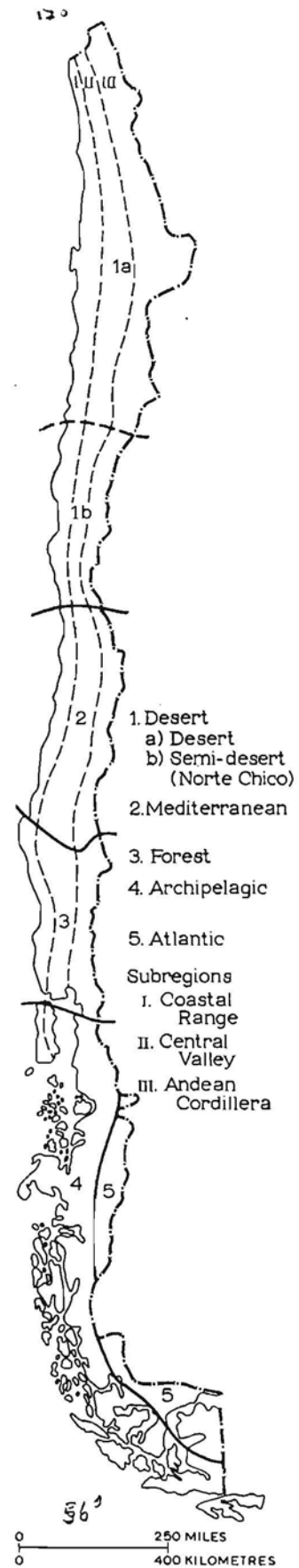
AVERAGE ANNUAL  
TEMPERATURE  
(DEGREES CENTIGRADE)



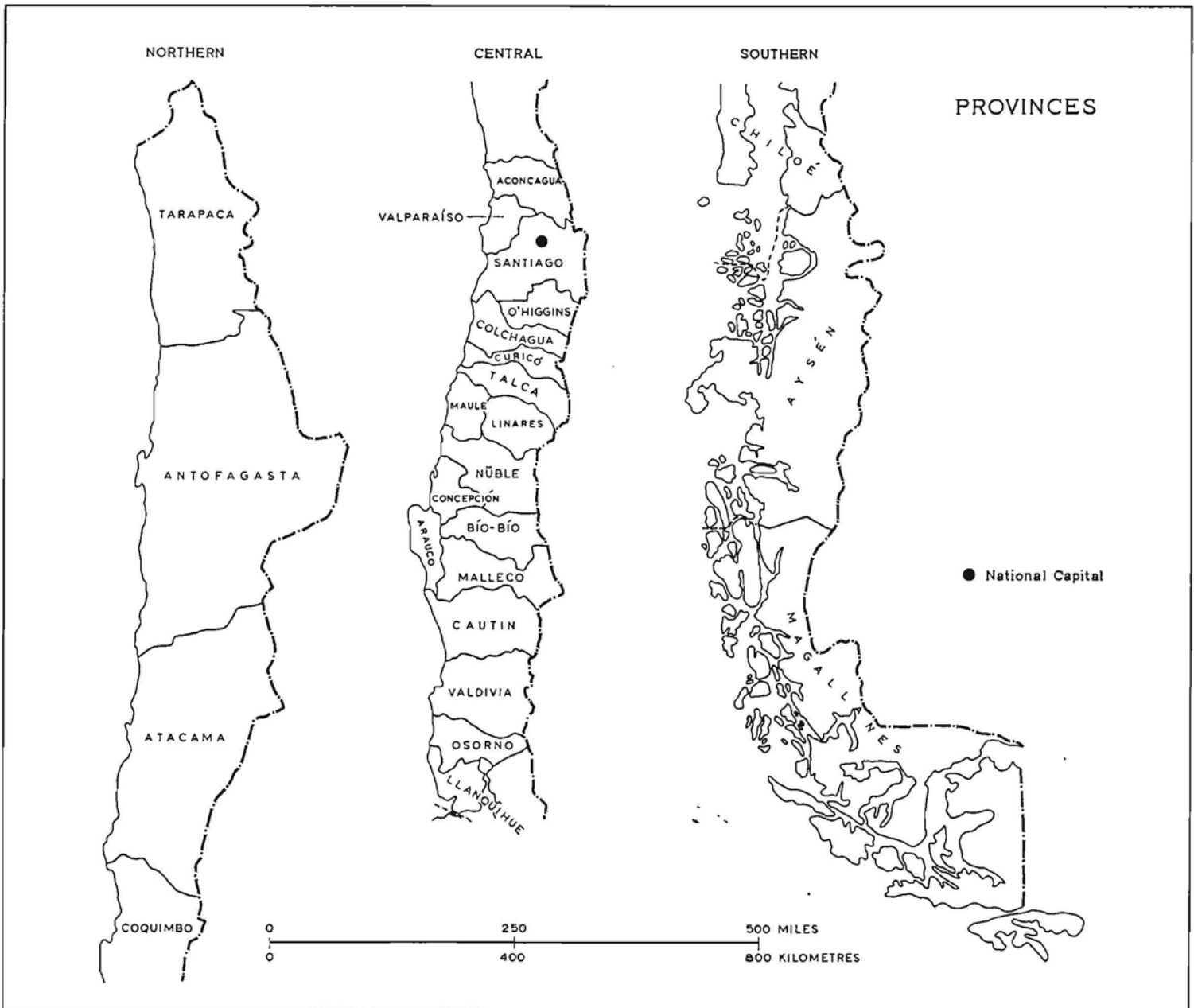
AVERAGE ANNUAL  
RAINFALL



NATURAL REGIONS



CHILE



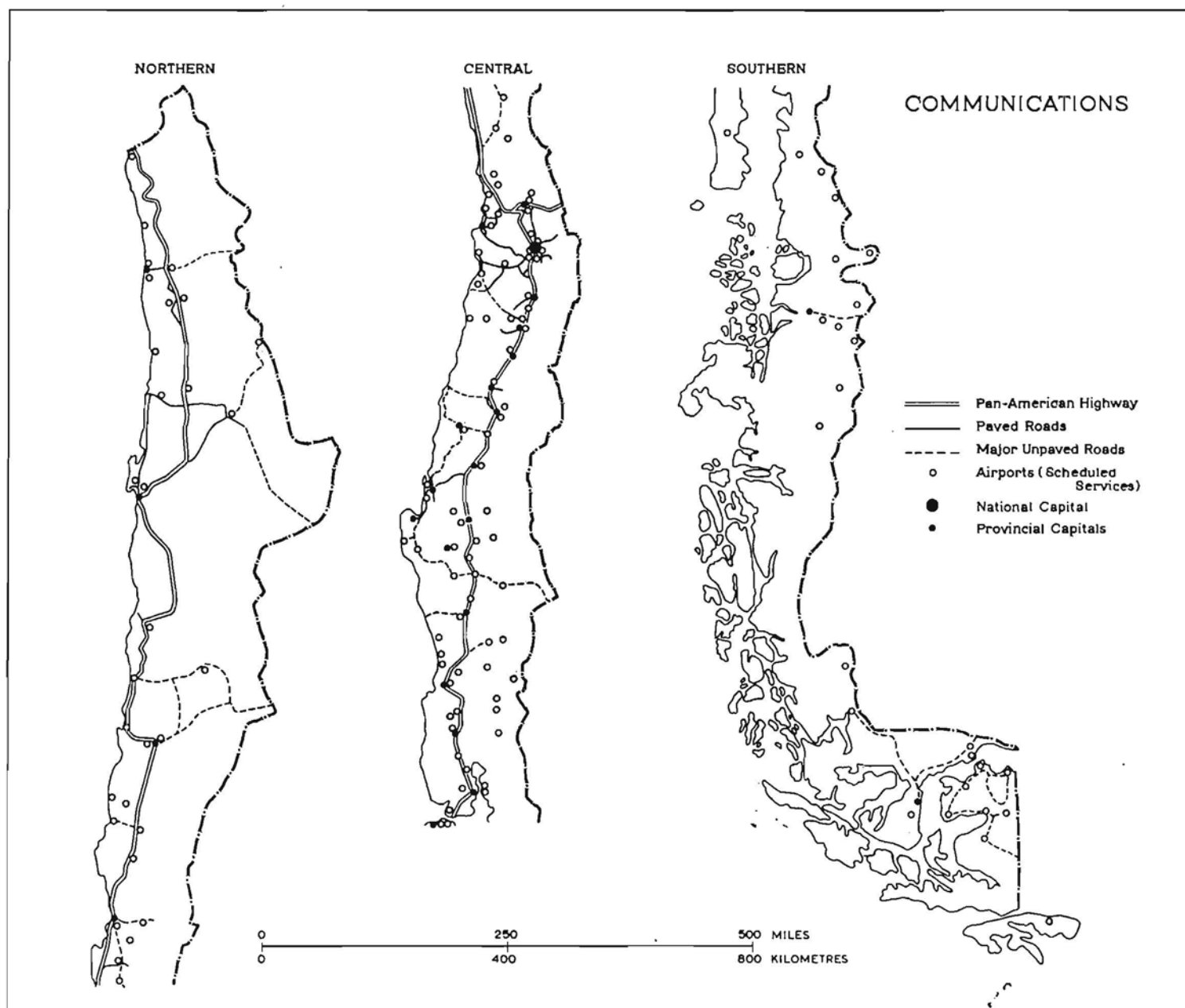
a series of tectonic basins partially filled with alluvial rock debris. South of Talca a string of dormant and active volcanoes has added vast volcanic outpourings to the alluvial deposits of the central basins.

Climatic contrasts within the country are even more pronounced than the variations in relief. Precipitation increases from virtually nothing in the extreme north to over 3,000mm in parts of Magallanes. The length of the rainy season increases from zero in northern, desert Chile, to 4 months in central Chile, and 12 months in Magallanes. In addition to these latitudinal extremes there also occur great variations from west to east. In the Coastal Range and the Andes rainfall aggregates are generally higher than in the Central Valley. Two of the more important exceptions are in the north, where desert conditions prevail in both the Coastal Range and the Central Valley and in Magallanes, where aggregates fall markedly on the leeward side of the Andes.

There are also very great differences in average temperatures. The most significant contrasts are produced by differences in latitude and altitude. Average annual temperatures range from over 20°C in the northern desert to less than 6°C in southern Magallanes. Even in the north, however, winter temperatures in the Andes often drop to below 0°C.

Further south the permanent snow line falls from 5,000m in Aconcagua to 2,000m in Malleco. Temperatures throughout Chile are affected by the cold Humboldt Current; north of Valdivia they are lower than would be expected, south they are higher because the waters of the current are colder than the atmosphere in the one case and warmer in the other.

Although the three relief components are represented throughout the 4,000 km of length of Chile, all authorities agree that latitudinal variations within the climatic pattern form the basis of the regional subdivision of the country. From north to south the country falls into several sharply contrasted major natural regions, of which the northernmost is the Northern Desert, embracing the provinces of Tarapacá, Antofagasta, and northern Atacama, where the climate is mainly arid. Rain falls perhaps once in a decade on the coast and only exceeds 50mm in a year in the Andes. Mean annual temperatures are uniformly high throughout the region, although winter night temperatures in the Andes sometimes fall below 0°C. Numerous small ephemeral mountain torrents rise in the Cordillera and peter out in the basins of the Central Depression. Only the Loa river reaches the sea. Natural vegetation is restricted to mimosa thickets in oases tapping underground water on the Coastal Range and in the Central



Depression and to xerophytic scrub on the higher slopes of the Andes.

The southern half of Atacama province and the province of Coquimbo form a transitional semi-desert region known as the Norte Chico (desert fringe). Although winter precipitation rarely exceeds 300mm, absolute drought is rare. Copiapó, Huasco and other large rivers reach the sea and the vegetation changes to a xerophytic scrub-bush climax.

The region extending from Aconcagua to Bío-Bío (described here as Mediterranean Chile) is known as the Chilean Heartland. The persistence of a mediterranean rainfall regime has endowed the area with a certain measure of unity. Most of the annual precipitation falls in the winter months. Annual aggregates increase steadily from north to south and from west to east. Between Talca and Bío-Bío provinces rainfall aggregates rise from 500mm to 3,000mm in the Coastal Range, 300mm to 1,500mm in the Central Valley and 400mm to 3,000mm in the Andean foothills. Several authorities subdivide the Mediterranean region into a semi-arid northern section (comprising the provinces of Aconcagua, Valparaíso, Santiago, O'Higgins, Colchagua, Curicó and Talca) and a more temperate southern section (comprising the provinces of Maule, Linares, Ñuble, Concepción and Bío-Bío).

From a third to a half of the width of the region is taken up by the Andes. The peaks of the highest mountains are above the permanent snow line (3,200m in Bío-Bío, 5,000m in Aconcagua). Alpine pastures lie below the snow line in the northern section of the region; the lower slopes are covered with dense forests in both parts of the region. The depressions of the Central Valley are floored with alluvial and volcanic deposits. The small scattered oases of the northern part of the region are succeeded by larger contiguous basins further south. Numerous westward flowing, incised rivers traverse the area. Silt-laden meltwaters from the Andes produce a regular regime despite the local summer drought. The Coastal Range takes up another third of the north region. Although altitudes fall from 2,500m in the north to 600m in the south, the cliffed shoreline remains unbroken except for the incised river valleys which break the range into large irregularly shaped blocks.

South of the Bío-Bío river stretches the third major natural region, Forest Chile (comprising the provinces of Arauco, Malleco, Cautín, Valdivia, Osorno and Llanquihue). Rainfall aggregates range between 1,200mm and 1,400mm on the coast, 1,500mm and 2,500mm in the Central Valley and 2,500mm and 4,000mm on the Andean foothills. The heavier



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rainfall and the disappearance of the summer drought have produced a forest cover, mainly of deciduous beech. The Andes and the Coastal Range become lower and discontinuous: glacial debris is spread over the surface of the Central Valley and large lakes fringe the border between the Andes and the Central Valley.

The Archipelagic (cold temperate) region stretches from Chiloé province in the north, through Aisén to Magallanes province in the south. The Coastal Range and Cordilleras are broken into thousands of islands and channels. The Central Valley is largely submerged. Rainfall aggregates are everywhere high (over 3,000mm) and exceed 8,000mm in places. Strong winds, often exceeding 80 km per hour, are recorded on 125 days of the year and the sun shines on only 51 days of the year. The snow line lies at about 700m in the summer. Evergreen forests cover most of the region. Stunted bush and bare rock surfaces are common.

In Aisén and Magallanes provinces the land on the leeward (eastern) side of the Andes and on both sides of Magellan's Strait forms the Atlantic region. This area receives little rain (300-800mm) but snow is common in the winter months (June-August). Strong cold winds blow throughout the year, reaching velocities of 80 km per hour in spring. The dry winds parch the ground and vast tracts of grassland are common in exposed areas.

The peculiarities of the country's shape, relief, climate and vegetation make the development of communications a formidable problem. The longitudinal distortion of Chile increases interregional distances; 78 per cent of the state is rugged mountain or hill country, 40.3 per cent is desert, 44.2 per cent is densely forested and 33.5 per cent is composed of archipelago and islands. In reality, however, these difficulties have not proved serious handicaps because 91 per cent of the population lives in the compact central rectangle between La Serena (Coquimbo province) and Puerto Montt (Llanquihue province).

Despite the physical difficulties the longitudinal railroad stretches over 23° of latitude, from Pisagua to Puerto Montt. A pioneer in South American railroad construction, Chile has 8,352 km of main and branch lines, of which 6,212 km are state-owned. The state-owned railways operated at a loss after the war. A modernization programme, involving electrification of the main trunk lines, was begun in 1954. The scheme cost 100 million U.S. dollars and the railway system now operates with a slight profit margin.

Government support for road-building began in 1920. Since 1945 the Chilean section of the Pan-American highway has been completed, together with another major road linking Santiago and Puerto Montt. With these notable exceptions the majority of Chilean roads are still unsurfaced.

Despite the relatively large road and rail system, the difficulties imposed on all land transportation have diverted the bulk of haulage to ocean and air, freight by the former, pas-

sengers by the latter. The sea is the cheapest means of transport and Chile has thirteen major seaports with facilities ranging from docks to offshore anchorages. Over 20 million tons of cargo are handled annually. The postwar years have seen a great increase in air transport in Chile. In 1956 the national air line (LAN) carried 267,766 passengers and 2,660 tons of cargo, compared with 9,838 passengers and 27 tons in 1940.

2. Population

The population of Chile at the last census (1960) was 7,374,115. There is less racial diversity in Chile than in most Latin American countries. Of the pure-blooded indigenous Indians, who comprise approximately 10 per cent of the population, 95 per cent live in the forest land between the Bío-Bío and Toltén rivers. At least 65 per cent of the population is mestizo, the product of free intermarriage between Spanish settlers and Indians in the Mediterranean heartland from 1541 onwards. Perhaps 25 per cent of the population consists of "white" settlers; Germans, Italians and others, many of whom have colonized the forested provinces south of the Bío-Bío during the past century.

The age structure of the population is overweighted in the younger groups. In 1960 39.6 per cent of the population was under 15 years of age; only 6.7 per cent exceeded 60 years of age. There are few countries in the world with a higher birth rate; it was 35.7 per thousand in 1961. Birth and death rates are highest in the cities. The death rate has halved in the past 25 years from 23.9 per thousand in 1935 to 11.0 per thousand in 1961. Infant mortality, exceeded only in Egypt, Ecuador and Guatemala, is 127.3 per thousand live births and is highest in the rural areas.

TOTAL POPULATION AND PERCENTAGE INCREASE, 1907 TO 1960

Year	Persons (1,000)	Average annual increase %
1907	3,231	—
1920	3,732	0.9
1930	4,287	1.2
1940	5,024	1.2
1952	5,931	1.0
1960	7,374	1.6

Though Chile has doubled its population during the present century, the increase is in no way comparable with that in Argentina and Brazil. The rate of population growth per annum, 2.5 per cent, is slightly under the average for Latin America. Despite this relatively modest rate of growth the average population density has risen from 6.5 per km<sup>2</sup> in 1940 to 9.9 in 1960. Averages mean very little in Chile, however, for provincial densities range from 0.4 per km<sup>2</sup> in Aisén to 139.9 in Santiago. Regional differences are enormous.

In 1960, Mediterranean and Forest Chile (26.2 per cent of the area of the country), had 86.8 per cent of the total population and Greater Santiago had nearly 30 per cent.

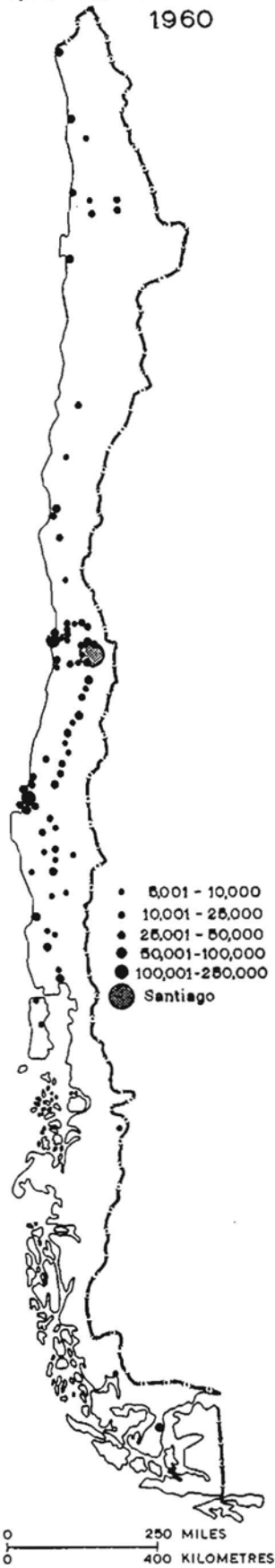
The natural increase in the population has largely been absorbed by migration to the towns and cities of central Chile. The urban sector expanded from 27.0 per cent of the population in 1920 to 52.5 per cent in 1940. The process of urbanization has since become more intense; in 1960, 68.2 per cent

ROADS, 1920 TO 1960

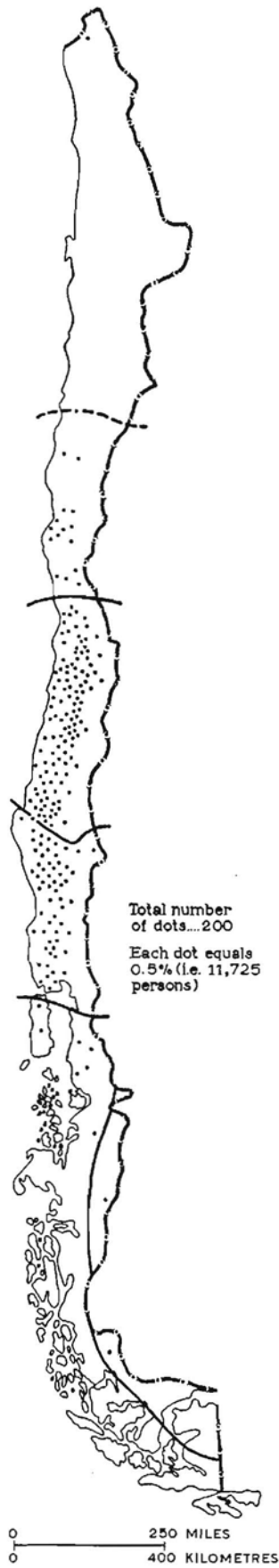
Road type	1920		1940		1960	
	Length (1,000 km)	% of total	Length (1,000 km)	% of total	Length (1,000 km)	% of total
Paved . . .	—	—	1.0	2.2	3.1	5.5
All-weather .	0.5	1.5	14.3	31.7	22.0	38.0
Earth . . .	33.5	98.5	29.5	66.1	32.8	56.5
Total . . .	34.0	100.0	44.8	100.0	57.9	100.0

Source: Ministerio de Obras Públicas, Dirección de Vialidad, 1961.

TOWNS  
WITH MORE THAN  
5,000 INHABITANTS  
1960



RURAL POPULATION  
1960



POPULATION  
INCREASE  
1940-1960



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URBAN AND RURAL POPULATION BY REGIONS, 1960  
(as percentages)

Region	Urban	Rural
Desert . . . . .	72.9	27.1
North Mediterranean . . . . .	80.6	19.4
South Mediterranean . . . . .	66.1	33.9
Forest . . . . .	46.2	53.8
Archipelagic . . . . .	49.0	51.0
Chile . . . . .	68.2	31.8

Source: Dirección de Estadística y Censos, Características Básicas de la Población (Censo 1960), 1964.

lived in towns. Despite attempts to colonize the northern and southern extremities of the country, the increase in the proportion of the population living in the larger cities is likely to continue. The three largest cities in Chile, Santiago, Valparaíso and Concepción have nearly 40 per cent of the total population.

The high birth rates and death rates are aspects of the poverty which prevails in Chile. The International Labour Office estimates that 11.9 per cent of the population suffers from malnutrition, 27.3 per cent from serious malnutrition and 11 per cent from desperate malnutrition. These conditions are found in both town and country. The illiteracy rate is about 20 per cent, rising slightly to 23 per cent in rural areas. Over 440,000 children have no schools to go to. Despite these forbidding figures, Chile is the third most literate country in Latin America.

In 1961 the Ministry of Education prepared a preliminary report analysing current educational conditions and preparing planning bases for future educational development. In the same year the Ministry was allotted 21.9 per cent of the total national budget.

One of the reasons for Chile's pressing economic problems is the relatively small size of the labour force. In 1960 only 32 per cent of the total population was economically active. Although mining and service activities have grown in importance in the postwar years, agriculture is still the largest single employer. According to the 1960 Population Census the total economically active population engaged in agriculture was 648,000 persons, or 27.5 per cent of the total labour force.

ECONOMICALLY ACTIVE POPULATION BY SECTORS  
OF ECONOMY, 1952 AND 1960

Sector	1952		1960	
	Persons (1,000)	%	Persons (1,000)	%
Agriculture . . . . .	649	30.1	649	27.5
Mining and quarrying . . . . .	101	4.7	97	4.1
Manufacturing industries . . . . .	409	19.0	406	17.2
Construction . . . . .	102	4.7	165	7.0
Electricity, gas, water, sanitary . . . . .	499	23.2	568	24.1
Commerce . . . . .	223	10.3	225	9.6
Transport and communications . . . . .	95	4.4	120	5.1
Activities not specified . . . . .	77	3.6	126	5.4
Total . . . . .	2,155	100.0	2,356	100.0

Source: Dirección de Estadística y Censos, 1961.

The agricultural labour force was classified in 1952 according to occupation as follows:

	Number	%
Farmers and members of family (1) . . . . .	332,000	49.6
Permanent workers (2) . . . . .	146,000	23.3
Temporary workers (2) . . . . .	171,000	27.1
Total agricultural labour force . . . . .	649,000	100.0

Source: Censo Agrícola y Ganadero, 1955.

These figures conceal significant regional variations; in Mediterranean Chile the *hacienda* system of ownership survives and the proportion of permanent and temporary workers is consequently very high. In the more recently settled northern and southern extremities of the country, the proportion of farmers and families (i.e. owners) is much higher. Magallanes province is a significant exception. Here vast sheep ranches are maintained by a large seasonal work force.

ECONOMICALLY ACTIVE AGRICULTURAL POPULATION  
BY OCCUPATION AND REGIONS, 1955  
(as percentages)

Region	Farmers	Workers	
		Permanent	Temporary
Desert . . . . .	59.9	18.8	21.3
Mediterranean . . . . .	31.3	32.7	36.0
Forest . . . . .	63.9	14.7	21.4
Archipelagic . . . . .	79.9	6.6	13.5
Atlantic . . . . .	19.8	17.1	63.1
Chile . . . . .	49.6	23.3	27.1

Source: Censo Agrícola y Ganadero, 1955.

Adequate information is lacking on the levels of unemployment and underemployment in agriculture. It is generally recognized, however, that they have both risen significantly in the past decade. There is a high level of disguised unemployment, particularly on the minifundia, or dwarf holdings.

No specific studies of permanent and seasonal migrations have been made. The volume of emigration and immigration is now very small. In 1907 the number of European immigrants reached 135,000; today the number is less than 90,000 in a year. Analysis of the background material in the 1960 census reveals that the proportion of temporary workers is high — 27.1 per cent of the agricultural population. It can be inferred, therefore, that considerable regular inter- and intra-provincial season migrations occur.

Comparison of the 1907 and 1960 censuses reveals that the much-vaunted spread of population to the undeveloped northern and southern extremities of the country has taken place on a very modest scale. Although the population of all the developing regions increased in absolute terms between 1907 and 1960, only the forest lands south of the Bio-Bio increased at a rate approaching that of the country as a whole. The

(1) Labourers, renters, tenants or occupiers, plus members of the family who work at least one-third of the time in agriculture.

(2) Including administrators, technical experts, specialist resident workers and sharecroppers.

(3) Workers, labourers and outside workers.

## POPULATION CHANGES BY REGIONS, 1907 AND 1960

Region	% of total area	Population				Absolute gain (1,000)	Increase (1907=100)
		1907		1960			
		Persons (1,000)	%	Persons (1,000)	%		
Desert . . . . .	29.5	266	8.2	396	5.4	130	149
Semi-desert . . . . .	10.8	223	6.9	367	5.0	144	165
North Mediterranean . . . . .	8.4	1,391	43.2	4,034	53.1	2,643	290
South Mediterranean . . . . .	7.1	707	21.9	1,244	16.9	537	175
Forest . . . . .	10.7	537	16.6	1,123	16.8	586	209
Archipelagic and Atlantic . . . . .	33.5	104	3.2	210	2.8	106	202
Chile . . . . .	100.0	3,228	100.0	7,374	100.0	4,146	228

population of the Desert and Archipelagic regions increased at rates substantially lower than the national figure. Throughout the years the Mediterranean core has remained the principal area of population growth. Between 1940 and 1960 the region accounted for 82 per cent of the country's population increase and Santiago province had nearly 47 per cent of the total.

### 3. Exploitation of resources, ownership, and land tenure

The Chilean government is currently deeply involved in serious efforts to reduce the gap between the rates of population growth and of food production. A preliminary survey of the land use capacity of the country's soils was undertaken

by the Ministerio de Agricultura in 1961. Eight classes of soil type were recognized, according to type, extent and intensity of potential use and the degree of conservation necessary to make them economically viable.

The survey revealed that the greater part of the country is unusable for agricultural purposes: about 15 per cent is potentially useful for sown grazing land and 8 per cent for cultivation. In 1955, however, only 4 per cent of the country was under sown grazing land and less than 4 per cent under cultivation. Most of the potentially usable land is located in the Forest, Archipelagic and Atlantic regions. The greatest extent of undeveloped arable land, however, is to be found in the estancias of Central Chile.

#### POTENTIAL LAND UTILIZATION BY REGIONS, 1961 (in thousand hectares)

Region	Total area	Arable Soil classes 1-4	Pasture Soil classes 5-7	Forest and other uses Soil classes 6-8
Desert . . . . .	17,835	16.0	600.0	17,219.0
Semi-desert . . . . .	11,977	275.0	1,050.0	10,652.0
North Mediterranean . . . . .	9,302	2,320.0	2,486.6	4,495.4
South Mediterranean . . . . .	5,435	1,566.0	1,717.5	2,151.5
Forest . . . . .	4,842	1,245.0	1,430.0	2,167.0
Archipelagic and Atlantic . . . . .	24,785	442.0	3,988.5	20,354.5
Chile . . . . .	74,176	5,864.0	11,272.6	57,039.4

Source: Corporación de Fomento de la Producción, 1962.

#### CLASSIFICATION OF SOILS ACCORDING TO CAPACITY, 1961

Class	Potential use			Conservation needed
	Utilization	Extent	Intensity	
1	Arable	Full	Full	None
2	Arable	Full	Moderate	Very slight
3	Arable	Restricted	Limited	Moderate
4	Arable	Very restricted	Very limited	Substantial
5	Pasture	Full	Full	None
6	Pasture	Restricted	Limited	Moderate
7	Pasture-Forest	Very restricted	Very limited	Substantial
8	Uncultivable	None	None	None

Class	Area (1,000 ha)	% of total area
1	264.3	0.36
2	1,481.4	2.00
3-4	4,118.4	5.55
5	300.0	0.40
6-7 (pasture)	10,972.5	14.79
7 (forest)-8	57,039.4	76.90
Chile . . . . .	74,176.4	100.00

Source: Corporación de Fomento de la Producción, 1962.

Large investments of capital, both private and public, have been made in developing Chilean agriculture in the past twenty years. Investments in irrigation constitute the largest single public use of capital in agriculture. It has been estimated that about 25 per cent of the present irrigated area has been utilized for at least seventy years. Parts of the country have been irrigated since the beginning of the 19th century.

Irrigation is of great importance to Chile, since 40.3 per cent of the country is desert and the most important agricultural area, the Mediterranean Region (15.5 per cent of the total area), has a dry season extending through the spring and summer months. Most of the present irrigated area was incorporated into the system during the past sixty years, financed primarily by private enterprise. The government has made a large contribution to investment in irrigation since the formation of the Dirección de Riego of the Ministerio

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de Obras Públicas (Ministry of Public Works) in 1914. The government is currently carrying out an accelerated investment programme costing 44.6 million U.S. dollars.

According to the Dirección de Riego approximately 1.4 million hectares were under irrigation in 1960, 471,200 hectares were in course of development and a further 634,000 hectares under study.

Most of the existing and potential irrigated land is located in the Chilean heartland.

Government irrigation works and projects are also located almost exclusively in the Mediterranean Region.

The costs of constructing and maintaining the private irrigation works is not known, but it is certain that the expenditure exceeds the substantial investments made by the government.

IRRIGATED AREAS BY REGIONS, 1960

Region	Under irrigation, 1960		Irrigation projects under way		Under study	
	Area (1,000 ha)	% of total	Area (1,000 ha)	% of total	Area (1,000 ha)	% of total
Desert . . . . .	17.8	1.3	1.4	0.3	14.6	2.3
Semi-desert . . . . .	122.3	8.8	57.0	12.1	56.3	8.8
North Mediterranean	786.7	57.0	299.0	63.4	177.3	27.7
South Mediterranean	365.0	26.2	109.2	23.2	276.8	44.2
Forest . . . . .	87.9	6.3	4.6	1.0	108.8	17.0
Archipelagic . . . . .	2.0	0.1	—	—	0.2	—
Atlantic . . . . .	3.7	0.3	—	—	—	—
Chile . . . . .	1,385.4	100.0	471.2	100.0	634.0	100.0

Source: Dirección de Riego, Ministerio de Obras Públicas, 1963.

GOVERNMENT IRRIGATION SCHEMES COMPLETED BY REGIONS, 1962

Region	Area (1,000 ha)	% of total area	Cost (1,000 U.S. dollars)	% of total cost
Desert . . . . .	17.7	3.0	7,107.0	10.7
Semi-desert . . . . .	51.5	8.9	14,537.0	21.9
North Mediterranean	330.1	56.9	18,263.0	27.5
South Mediterranean	149.1	25.7	24,120.0	36.3
Forest . . . . .	31.5	5.4	2,388.0	3.6
Archipelagic . . . . .	0.5	0.1	11.0	—
Atlantic . . . . .	—	—	—	—
Chile . . . . .	580.4	100.0	66,426.0	100.0

Source: Dirección de Riego, Ministerio de Obras Públicas, 1963.

The rivers are the chief source of water for irrigation, although groundwater is used in the desert provinces of Tarapacá and Antofagasta.

Limited studies of a few projects have revealed that existing irrigation water is being poorly utilized and that investment would be more profitable if existing producers were given information on water-managing techniques rather than on building new works.

The results of a preliminary government survey published in 1960 suggest that the present area of irrigated land could be increased by over 900 per cent. Three classes of potentially irrigable land were recognized:

- Class A. Cultivable land, easily irrigated.
- Class B. Cultivable land, irrigable, with slight limitations.
- Class C. Cultivable land, irrigable, with moderate to severe limitations.

POTENTIALLY IRRIGABLE LAND (in million hectares)

Land class	Irrigable naturally	Irrigable artificially	Total irrigable land
A . . . . .	1.6	3.4	5.0
B . . . . .	1.4	1.5	2.9
C . . . . .	0.2	2.3	2.5
Total . . . . .	3.2	7.2	10.4

Source: Recursos Hidráulicos de América Latina, Chile 1, 1960.

Colonization of new lands, outside the Chilean heartland, began on a significant scale after 1845, when lands in the forested provinces of Valdivia and Llanquihue were granted to German settlers. Numerous European communities subsequently established colonies in the provinces south of the Bío-Bío.

In 1928 the organization of settlement was entrusted to the Caja de Colonización Agrícola.

Its principal function was the establishment of settlements on land "... of the government or of private owners, as might prove necessary to bring such land into production more effectively".

The rate of establishment of new settlements was very limited before 1960 (between 1925 and 1955, the total agricultural area increased from 4.8 to 5.9 million hectares) when new authorizations resulted in an intensified rate of settlement and resettlement. In 1962 the organization was transformed into the Corporación de Reforma Agraria (CORA) by Law no. 15020. An appreciable number of private properties have already been offered to CORA for subdivision, because of its favourable terms of payment.

Between 1957 and 1962, the other major government organization responsible for colonization, Ministerio de Tierras y Colonización, leased or ceded 5.1 million hectares of state and semi-governmental land to occupants. By 1962 the Caja de Colonización Agrícola (CCA) and Ministerio de Tierras y Colonización (MTC) had disposed of 6.1 million hectares of government-owned land, chiefly in Forest and southern Chile.

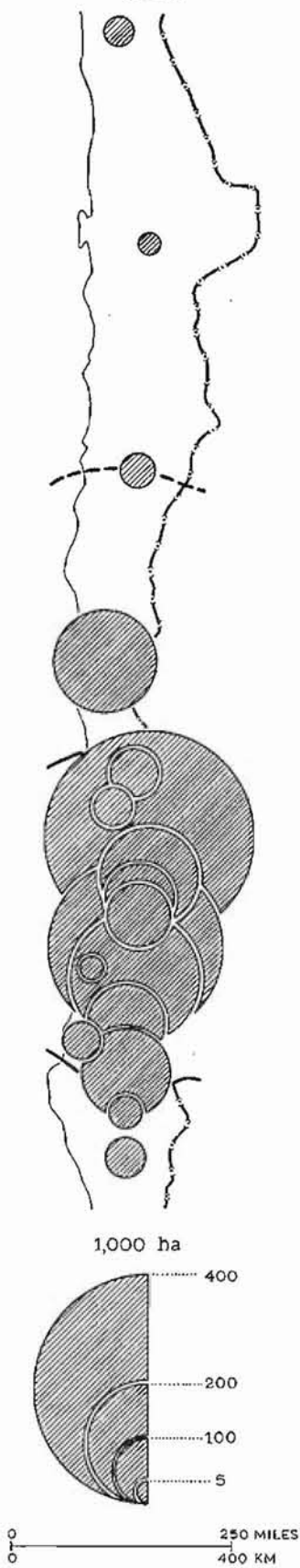
DISTRIBUTION OF LANDS CEDED BY THE CCA AND MTC, 1929 TO 1962

Group of provinces	CCA (1,000 ha)	MTC (1,000 ha)
Tarapacá-Coquimbo . . . . .	43.5	129.6
Aconcagua-Colchagua . . . . .	58.1	2,627.3
Curicó-Ñuble . . . . .	77.2	—
Concepción-Cautín . . . . .	129.0	73.2
Valdivia-Chiloé . . . . .	333.0	160.8
Aisén-Magallanes . . . . .	369.8	2,074.0
Chile . . . . .	1,010.6	5,064.9

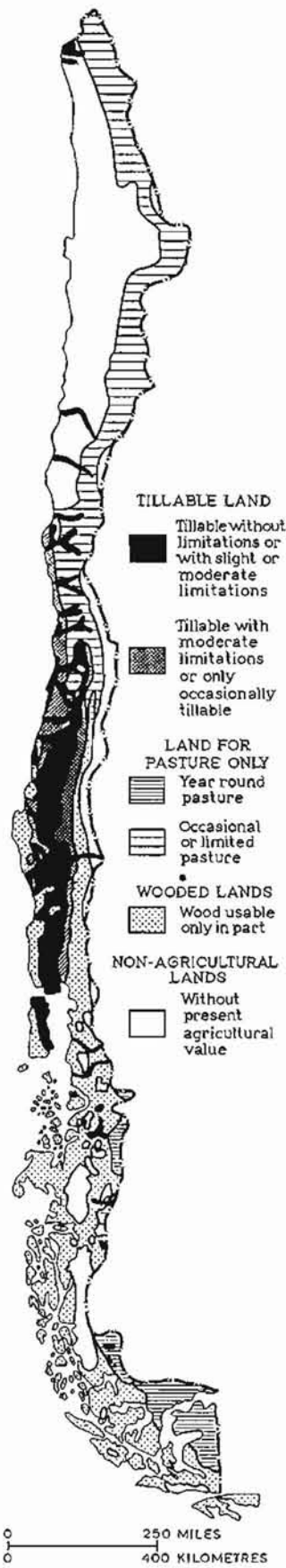
Source: Caja de Colonización Agrícola, 1962; Subsecretaría de Ministerio de Tierras y Colonización, 1962.



IRRIGATED AREAS  
AND PROJECTS  
UNDER WAY  
1960

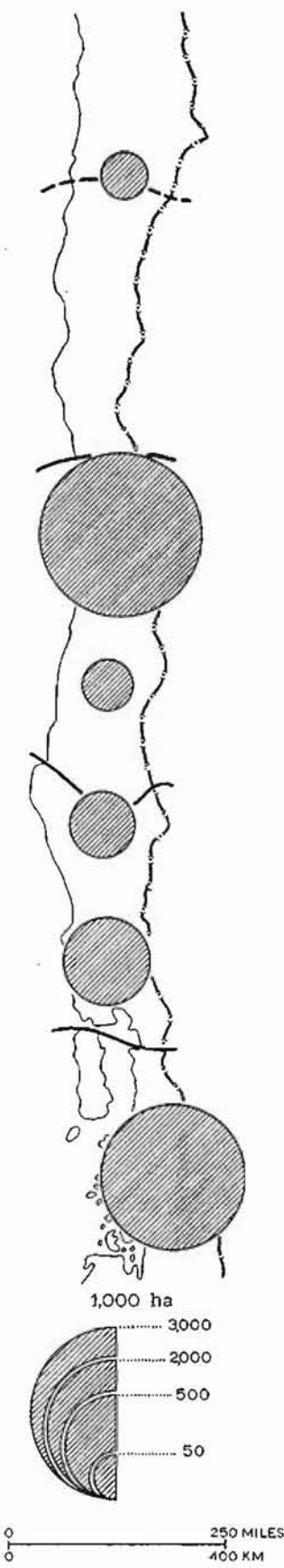


LAND CAPABILITY



LAND COLONIZED

1929-1962



## CHILE

The government has been able to lead this process of colonization because it is still the largest single landowner in Chile. In 1960 state-owned lands constituted 19.3 per cent of the national territory; 73.8 per cent of these were located in Archipelagic and Atlantic Chile.

STATE-OWNED AND STATE-CONTROLLED LAND, 1960

	Area (ha)	% of total government land
State-owned:		
Ministerio de Tierras y Colonización	8,656,941	60.47
Ministerio de Agricultura . . .	4,670,258	32.62
Ministerio de Educación . . .	1,724	0.01
Ministerio de Defensa Nacional . .	60,000	0.42
Ministerio del Interior . . .	11,000	0.08
Total state-owned land . . .	13,399,923	93.60
State-controlled:		
Corporación de Fomento de la Producción . . . . .	38,047	0.26
Corporación de la Reforma Agraria	447,148	3.12
Instituto de Desarrollo Agropecuario	7,974	0.06
Caja de Empleados Públicos y Periodistas . . . . .	39,875	0.27
Servicio Nacional de Salud . . .	301,415	2.11
Servicio de Seguro Social . . .	73,966	0.52
Universidad de Chile . . . . .	8,707	0.06
Total state-controlled land . .	917,132	6.40
Total government land . . .	14,317,055	100.00

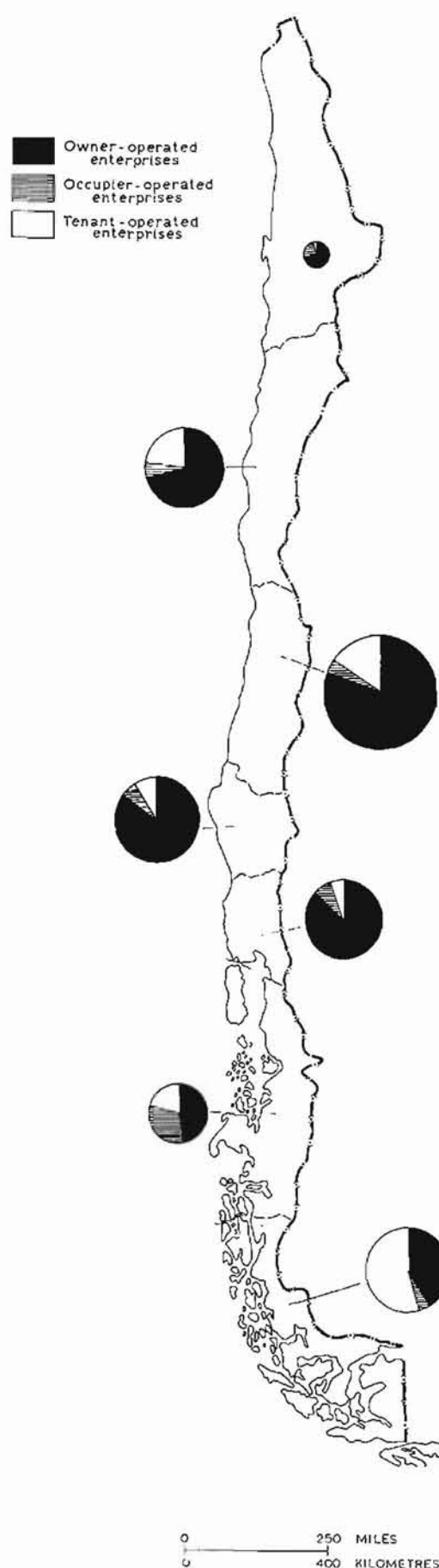
DISTRIBUTION OF STATE-OWNED AND STATE-CONTROLLED LANDS BY REGIONS, 1960

Region	Area (1,000 ha)	% of total government land
Desert . . . . .	1,265.0	10.3
Semi-desert . . . . .	571.0	4.7
North Mediterranean . . . . .	110.0	0.9
South Mediterranean . . . . .	144.0	1.2
Forest . . . . .	1,113.0	9.1
Archipelagic . . . . .	2,740.0	22.3
Atlantic . . . . .	8,374.1	51.5
Total government land . . . . .	14,317.1	100.0

Source: Departamento de Economía Agraria, Escuela de Agronomía, Univ. de Chile, 1960.

The primary reason for the Chilean peoples' inability to produce enough food is the primitive and inefficient use of ill-distributed farm land. The prevailing agrarian structure and types of enterprise are the results of a long process of social and economic evolution which began with the conquest and colonization of central Chile by the Spaniards. The newly conquered lands were divided by the Spanish Crown and shared among the officers of the conquering army. Initially the officers were granted *encomiendas*, or the right to collect taxes from the resident Indian communities. These grants were subsequently changed into actual proprietorship of the land itself. The size of the grant varied according to the

LAND TENURE 1955





status of the person to whom it was made: foot-soldiers received grants of around 74 hectares on the outskirts of towns and near the Auracanian border along the Bío-Bío; cavalry officers received grants of about 370 hectares and officers of senior rank often received grants of 5,000 hectares or more. The owners of the large estates — or *haciendas* — became, in accordance with the traditions of feudal society, the leaders of political, economic, and social life.

In succeeding centuries racial mixture between Indians and conquerors took place freely at all levels. Social differences gradually emerged in the new mestizo society as the contrast between landowner and landless tenants increased. The *inquilino* or worker and his family became increasingly attached to the estate on which he lived and worked. Although the *inquilinos* were free, they were conditioned from birth to accept the estate owner as their protector or patron.

New types of rural properties emerged in the 19th century as some of the excess rural population from central Chile became pioneers, pushing the frontier of settlement southwards beyond the Bío-Bío into Forest Chile. Most of the early important settlements were established by foreign immigrants (e.g. Germans, Spaniards, Italians and British). Many *inquilinos* subsequently joined the flood of pioneer settlers as the Bolivian and Peruvian wars broke their strong traditional ties with the *haciendas*. Many of the newcomers became squatters on Indian communal lands. Small and medium-sized estates predominated for a new rural democracy thrived under the new pioneer conditions.

In 1955 farm land in Chile amounted to 27,712.4 thousand hectares, that is 37.4 per cent of the total area of the country. The highest proportions of farm land lie in the Mediterranean and Forest zones, which have the most favourable climatic locations and soil resources.

According to the 1955 agricultural census, tenant-operated enterprises occupy as much as 22.8 per cent of the total farm land area, but this category of tenure is of only limited importance in the richer regions with greater areas of arable cultivation. Although its proportion reaches 15.6 per cent in the North Mediterranean region, it is only 8.6 and 6.0 per cent in the South Mediterranean and Forest regions respectively. It appears to be the form of tenure more particularly associated with those areas where rough grazing is the predominant land use — the Archipelagic and Atlantic and the Semi-desert regions.

The category of owner-operated enterprises, which includes both owner-operators and occupier-operators and those who occupy and farm the land by grant (*inquilinos*), is clearly the more important — occupying 77 per cent of the farm land area. Some owner-operated enterprises are cultivated by hired workers or by *medieros* — sharecroppers who receive a part of the gross product as wages.

In the Archipelagic region the farm area falling into the occupier-operated category is of particular importance, reaching as much as 31 per cent of the regional total. This is a zone of agricultural development, where farm structure is in the process of formation.

Approximately 19 per cent of Chilean farms are smaller than one hectare. Most of these very small units (minifundia) are to be found in central Chile. They are operated by *inquilinos* in conjunction with their obligatory duties on the estates of their patrons.

The condition of the minifundists is grave, since most of the units are too small to be economic under present systems of cultivation. The scale of the problem can be gauged from the fact that half of the farms in Chile are less than 10 hectares in extent. At the other extreme are the large estates or latifundia. In 1955, 696 farms, 0.5 per cent of the total, each exceeded 5,000 hectares in area, accounting for 54.7 per cent of the total farm land. The area of one estancia near Santiago is believed to exceed 160,000 hectares.

Until fairly recent times the only alternatives open to the growing *inquilino* population were to leave the estates and to move either to new lands in southern or northern Chile, to the mines, or to the cities. Since 1928 the government has attempted to improve the situation, without conspicuous success. The activities of the Caja Colonización Agrícola (now the Corporación de Reforma Agraria) and the Ministerio de

FARM LAND BY NATURAL REGIONS, 1955

Region	Total area (1,000 ha)	Farm land	
		Area (1,000 ha)	% of total area
Desert . . . . .	17,835.0	332.0	1.9
Semi-desert . . . . .	11,977.2	3,857.8	32.2
North Mediterranean . . . . .	9,302.1	7,628.7	82.0
South Mediterranean . . . . .	5,435.2	4,442.3	81.7
Forest . . . . .	4,842.4	3,549.3	73.3
Archipelagic . . . . .	11,243.0	2,262.8	20.1
Atlantic . . . . .	13,541.8	5,639.5	41.6
Chile . . . . .	74,176.7	27,712.4	37.4

Source: Tercer Censo Agrícola Ganadero, 1955.

LAND TENURE BY NATURAL REGIONS, 1955

Region	Owner-operated enterprises (a) Area (1,000 ha)	Occupier-operated enterprises (b) Area (1,000 ha)	Total (a+b)		Tenant-operated enterprises		Total farm land
			Area (1,000 ha)	% of total	Area (1,000 ha)	% of total	Area (1,000 ha)
Desert . . . . .	243.4	78.5	321.9	97.0	10.1	3.0	332.0
Semi-desert . . . . .	2,709.9	223.5	2,933.4	76.0	924.4	24.0	3,857.8
North Mediterranean . . . . .	6,171.3	266.6	6,437.9	84.4	1,190.8	15.6	7,628.7
South Mediterranean . . . . .	3,796.8	263.2	4,060.0	91.4	382.3	8.6	4,442.3
Forest . . . . .	3,084.6	252.1	3,336.7	94.0	212.6	6.0	3,549.3
Archipelagic . . . . .	1,077.4	710.1	1,787.5	79.0	475.2	21.0	2,262.7
Atlantic . . . . .	2,330.1	177.2	2,507.3	44.5	3,132.2	55.5	5,639.5
Chile . . . . .	19,413.5	1,971.2	21,384.7	77.2	6,327.6	22.8	27,712.3

Source: Tercer Censo Nacional Agrícola Ganadero, 1955.

# CHILE

FARMS BY SIZE GROUPS, 1955

Size group		Number	% of all farms	% of total farm land area
Under 1	ha . . . . .	28,246	18.7	—
1-10	ha . . . . .	47,381	31.4	0.8
10-50	ha . . . . .	41,420	27.4	3.5
50-200	ha . . . . .	20,820	13.8	7.3
200-1,000	ha . . . . .	9,842	6.5	15.2
1,000-5,000	ha . . . . .	2,554	1.7	18.5
Over 5,000	ha . . . . .	696	0.5	54.7
Total . . . . .		150,959	100.0	100.0

Source: Tercer Censo Nacional Agrícola y Ganadero, 1955.

Tierras y Colonización have been restricted to encouraging and facilitating colonization of hitherto unoccupied state-owned lands.

The fundamental problem of breaking up and redistributing the large estates has barely begun. The parcellation of the vast estancias represents the best single long-term solution to the problems of rural overpopulation, unemployment and underemployment. Most of the cultivable lands of the large estates are wastefully used for cattle rearing (over 80 per cent on farms exceeding 1,000 hectares). The government has tried to encourage owners to cede lands voluntarily to tenants and, more recently, it has tried to buy up estates at attractive prices. Most of the effective legislation has only recently been promulgated and consequently insufficient time has passed to determine whether it has made a noticeable impression. The most important legislation promulgated in recent years was the Agrarian Reform Law, passed in 1962. It recognizes the social and economic problems of the farmers on small and medium-sized holdings by reorganizing existing institutions and creating the Consejo Superior de Fomento Agropecuario (to prepare general and regional plans in connection with agrarian reform) and the Corporación de Reforma Agraria (to carry them out).

## 4. Land utilization, crops and animal husbandry

The 1955 Agricultural Census classified 27.7 million hectares as farm land, that is 37.4 per cent of the country's total area. The proportion of agricultural land was low in all regions, ranging from a maximum of 35.3 per cent in the South Medi-

terranean region to only 0.7 per cent in the Archipelagic and Atlantic regions.

In considering the different land use categories, it must be noted that since 1956 international agencies have included meadows and permanent grassland along with arable land, and certain vegetation types along with woods and forests, leading to a great increase in the area of the latter. These criteria have not been used in this account or in the land use map.

It is clear from these data that the central part of the country is the most widely exploited, both for cultivation and for rough grazing land. Rough grazing land exists in significant proportions in all regions of the country except the northern desert, and in the Archipelagic and Atlantic regions it effectively represents their only agricultural resource.

Chilean agriculture has been stagnating for many years. At least 50 per cent of the agriculturally useful land is covered

REGIONAL DISTRIBUTION OF AGRICULTURAL LAND AND ROUGH GRAZING LAND BY REGIONS, 1955  
(as percentages)

Region	Agricultural land	Rough grazing land
Desert . . . . .	0.1	1.3
Semi-desert . . . . .	1.6	15.6
North Mediterranean . . . . .	23.2	37.9
South Mediterranean . . . . .	35.3	24.7
Forest . . . . .	22.2	17.9
Archipelagic and Atlantic . . . . .	0.7	17.0
Chile . . . . .	40.5	16.8

by forests, about 25 per cent consists of natural grazing land and most of the remaining quarter is lying fallow. Only approximately 4 per cent of the country's total area is, at any given time, under cultivation. The area of cultivated agricultural land per head in Chile (1.01 hectares) is, however, higher than in many other Latin American countries.

The level of productivity is generally low. The price policy of the government in the early 1950s discouraged investment in agriculture. Large farms were left in the hands of labourer-tenants, whose farming practices were generally backward. About 88.4 per cent of Chile's agricultural area is taken up by only 8.7 of the farms (large farms exceeding 200 hectares in extent). The greater part of their land is wastefully employed in raising livestock. At the other extreme 50.1 per cent of the farms are uneconomic smallholdings of less than 10 hectares.

Since 1957 price controls have been removed on practically all basic agricultural commodities and production has immediately expanded. Varied facilities are now available to assist agriculture. The Ministry of Agriculture, assisted by five semi-autonomous departments, provides technical assistance and credit for farmers. Research organizations and advanced agricultural education institutions received 2.5 million U.S. dollars in 1962. Government and commercial organizations, banks, commercial firms and private lenders all provide credit for a variety of purposes. The banks provide the largest share (60 per cent in 1960) of the total recorded credit received by the agricultural sector. Development institutions provided 37 per cent and mortgage credit institutions the remaining 3 per cent.

The amount of money made available for investment in agriculture has increased considerably in a very short space of time. The Banco del Estado, for example, increased its credit grant from 17.9 million U.S. dollars in 1956 to 74.0 million in 1962.

LAND UTILIZATION, 1955

	Area (1,000 ha)	% of total
Arable land, market-gardens, gardens and nursery-gardens . . . . .	2,453.5	3.3
Fruit trees, vineyard, bushes and orchard land . . . . .	180.0	0.3
Meadows and permanent grassland . . . . .	2,909.9	3.9
Rough grazing land . . . . .	12,039.0	16.2
Woods and forests . . . . .	12,493.2	16.8
Non-agricultural land and inland waters . . . . .	44,101.1	59.5
Total . . . . .	74,176.7	100.0

RECENT MAJOR RECORDED INVESTMENTS  
IN AGRICULTURE

Source	Year	Million U.S. dollars	Purpose
Banco del Estado . . . . .	1961	6.5	Stockraising
Banco del Estado . . . . .	1962	74.0	General
Corporación de Fomento de la Producción (CORFO). . . . .	1962	12.0	Stockraising
CONFIN . . . . .	1962	3.4	General
Ministerio de Obras Públicas Caja de Colonización Agrícola (CCA) . . . . .	1960	44.5	Irrigation
	1962	2.3	Colonization

Source: Banco del Estado, CORFO, CONFIN, CCA, Ministerio de Obras Públicas, Secciones Estadísticas.

Mechanization of agriculture, though not yet greatly advanced, is making considerable progress. The stocks of imported agricultural machinery doubled between 1951 and 1955. The general economic and social advisability of encouraging mechanization has to be carefully considered in some areas, however, because of the persistence of unemployment and disguised unemployment in the rural sector. In other areas, particularly in the south, modern methods are necessary because speedy harvesting is important. Moreover, the 500,000 draught oxen in use are estimated to need as much as 250,000 hectares of pasture land which could be put to better use.

The most recent attempt by the government to improve the rate of increase in productivity of the agricultural sector is incorporated in the 1961-70 Ten-Year Plan for Economic and Social Development. The main purpose of the plan with respect to agriculture is to establish a basis for the orientation of the agricultural policy of the country for the next decade. It proposes to apply measures designed to create a suitable climate for the improvement of agricultural technology at the production and marketing levels.

The National Livestock Development Programme forms an integral part of the Ten-Year Plan. The Ganadero Plan suggests general measures for livestock promotion and development, for directing and lowering the prices of inputs, and for improving the health of livestock and the marketing system. The reasons for the special concern with livestock are obvious. In 1955 more than 90 per cent of Chile's agricultural lands were used for raising cattle. Although this land consists mainly of poor hill and mountain pasture its livestock-carrying capacity is estimated at 0.8 animals per hectare — four times the current population. Most of the livestock are of poor quality (e.g. in 1955 only 2 per cent of the 2.5 million cattle were pedigree animals, 98 per cent of these being Friesians).

Chile's forests are an important natural asset. The present extent of all types of forests and woodlands is estimated at about 12.5 million hectares, 17 per cent of the total surface area of the country. It is estimated that 54 per cent of all forests are privately owned, 43 per cent are owned by the state and that the remaining 3 per cent are of indeterminate ownership. Approximately 76 per cent is potentially exploitable, but only 42 per cent is currently accessible and commercially exploitable. Natural forest accounts for 44 per cent of the forested area, scrub forest for 55 per cent and commercial plantations for the remaining 1 per cent. In terms of volume, however, natural forest and commercial plantations account for an estimated 85 per cent of the standing volume of Chile's forests.

The vast southern part of Chile, south of the Bío-Bío, contains 85 per cent of all types of natural forests and 96 per cent of the commercially exploited forest. The natural forests

are predominantly composed of hardwood species, the most important commercial species being *Nothofagus obliqua*, *procera*, *dombeyi*; *Laurelia aromatica* and *serrata*; *Eucryphia cordifolia* and *Aetoxicon punctatum*. The remaining 7 per cent consists of coniferous species, the chief commercial species being *Pinus insignis*.

Despite recent statutory improvements in forestry practice, the loss through damage to Chile's forest resources is still considerable. Annual losses through fire exceed 56.6 million m<sup>3</sup>, through natural disasters 36.7 million m<sup>3</sup> and uncontrolled clearing, 5.7 million m<sup>3</sup>.

Chile has an important food-processing industry. In 1960 there were 1,585 registered factories employing 39,324 persons. Processed food industries accounted for 26.7 per cent of the value of total national agricultural production. The range of establishments has widened significantly in the past 10 years and the volume of processed foods reached 2.9 million tons in 1962, an average of 289 kg per head.

AGRICULTURAL FOOD PROCESSING FACTORIES <sup>(1)</sup>, 1960

Type	Establishments	% of total
Meat . . . . .	232	14.6
Milk . . . . .	74	4.8
Fruit and vegetables . . . . .	42	2.6
Fish . . . . .	62	3.9
Milling . . . . .	147	9.3
Baking . . . . .	736	46.4
Sugar refining . . . . .	8	0.5
Confectionery . . . . .	42	2.6
Other foods . . . . .	138	8.7
Alcoholic beverages . . . . .	76	4.8
Other beverages . . . . .	28	1.8
Total . . . . .	1,585	100.0

Source: Tercer Censo Nacional de Manufacturas, 1960.

PRODUCTION OF PROCESSED FOODS, 1962  
(in thousand tons) <sup>(2)</sup>

Refined sugar . . . . .	98.7
Wheat products . . . . .	1,321.9
Milk products (solid) . . . . .	49.6
Milk products (liquid) in million litres . . . . .	365.7
Fish . . . . .	9.8
Fruit . . . . .	25.2
Meat, frozen . . . . .	291.8
Edible oils . . . . .	37.7
Beer, in million litres . . . . .	242.9
Coffee . . . . .	2.3
Vegetables . . . . .	22.3

Source: Ministerio de Economía y Ministerio de Agricultura.

Most of the factories — 65.3 per cent of the total — produce basic food products: bread, meat products and refined sugar account for 96.6 per cent of the total output. The Chilean food-processing industry is consequently located chiefly in the large urban centres of the central region. Santiago stands out as the major producing province, with 33 per cent of all factories (527 establishments). In 1960 Greater Santiago had 52 per cent of Chile's *frigorífico* (meat storage and processing plants) capacity.

<sup>(1)</sup> Employing more than five persons.  
<sup>(2)</sup> Except where indicated otherwise.

# CHILE

FOOD PROCESSING FACTORIES BY REGIONS, 1960

Region	All Factories		Frigoríficos		
	Number	%	Number	Capacity (1,000 carcasses)	%
Desert . . . . .	190	12.0	6	107.9	4.7
Mediterranean . . . . .	1,118	70.5	14	2,169.4	95.3
Forest . . . . .	244	15.4	—	—	—
Archipelagic . . . . .	10	0.6	—	—	—
Atlantic . . . . .	23	1.5	—	—	—
Total . . . . .	1,585	100.0	20	2,277.3	100.0

Sources: Tercer Censo Nacional de Manufacturas, 1960; Agricultura y Ganadería, Año 6, 1961.

The importance of field crops grew both in relative and absolute terms in the decade 1950-60. The area under cultivation increased by more than 10 per cent. Improvements in techniques and conservation and cultivation, together with increased mechanization, have resulted in steadily rising production and heavier yields per hectare for almost all the principal field crops. Sugar beet and garden crops experienced the greatest relative increases. Wheat occupies the greatest percentage of the land under field crops (80 per cent). Chile is the only country in Latin America where the area of land under maize does not exceed that of any other food grain.

Despite government efforts to widen the range of farming

activities, the rearing of livestock still dominates the agricultural economy of Chile. The annual rate of increase in numbers ranged between 2.4 and 2.9 per cent over the decade 1950-60. A comparison of the quinquennial figures for 1951-55 and 1956-60 reveals that the numbers of cattle and sheep have remained virtually unchanged, whereas the numbers of pigs, goats and poultry have all risen appreciably.

LIVESTOCK AND MEAT PRODUCTION, 1950-55 AND 1956-60

Type	Numbers (1,000 head)		Meat production (1,000 tons)	
	1951-55	1956-60	1951-55	1956-60
Cattle . . . . .	2,882.5	2,883.3	134.7	137.5
Pigs . . . . .	825.0	959.4	43.0	43.8
Sheep . . . . .	6,189.6	6,071.9	35.8	32.7
Goats . . . . .	968.4	1,067.5	7.6	7.4
Poultry . . . . .	7,159.9	8,009.1	14.1	15.8

Source: Ministerio de Agricultura, Departamento de Economía Agraria, 1963.

The internal demand for forest products has risen sharply recently with the growth of building and related industries. The production of cut timber rose from 7.6 million m<sup>3</sup> in 1959 to 9.1 millions in 1961. Between 1960 and 1962 the building industry consumed 3.1 million m<sup>3</sup> per annum. In 1962 the major secondary industries produced 10 million m<sup>3</sup>

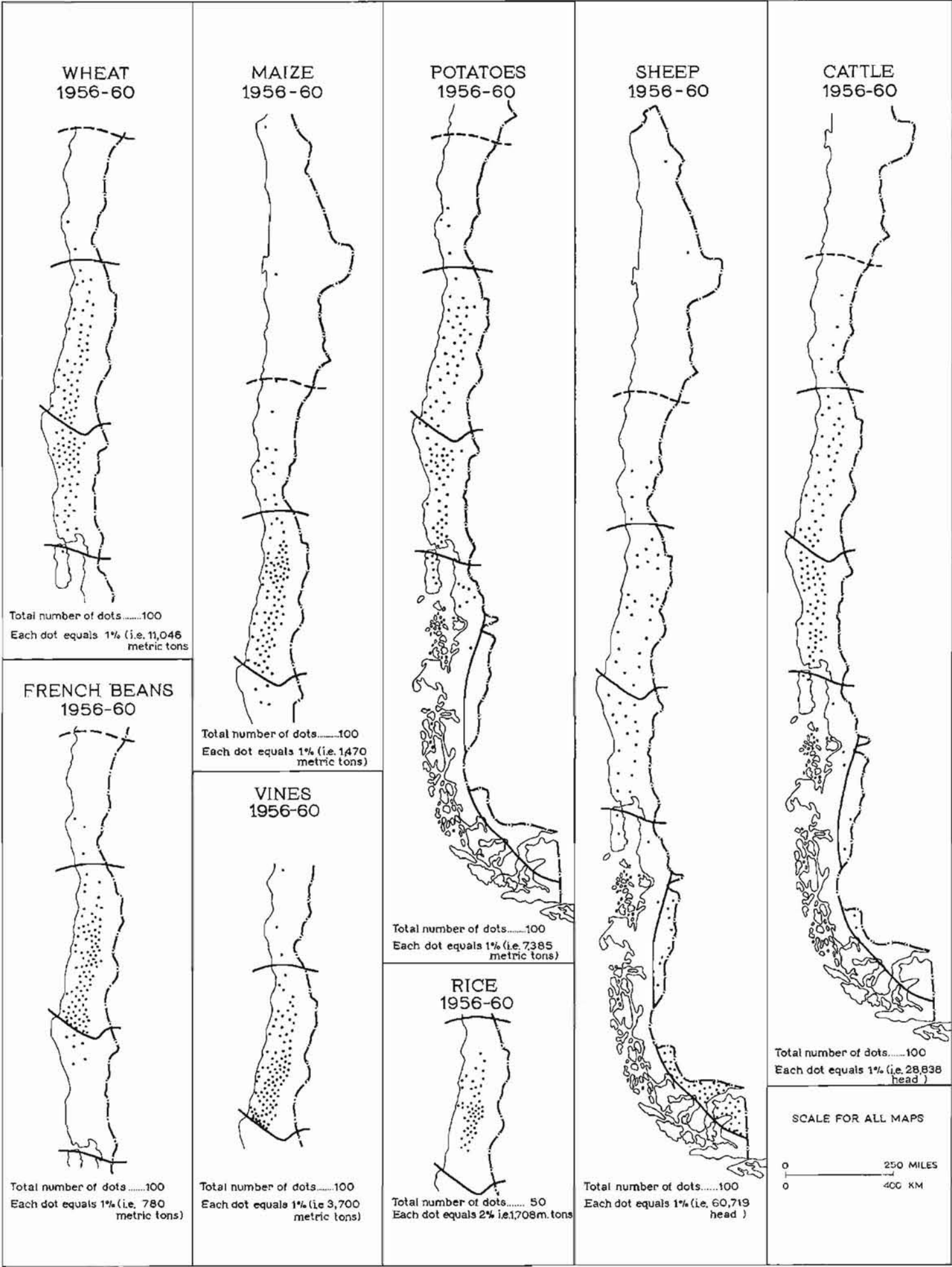
AVERAGE ANNUAL AREA, PRODUCTION AND YIELD OF PRINCIPAL CROPS, 1950-55 AND 1956-60

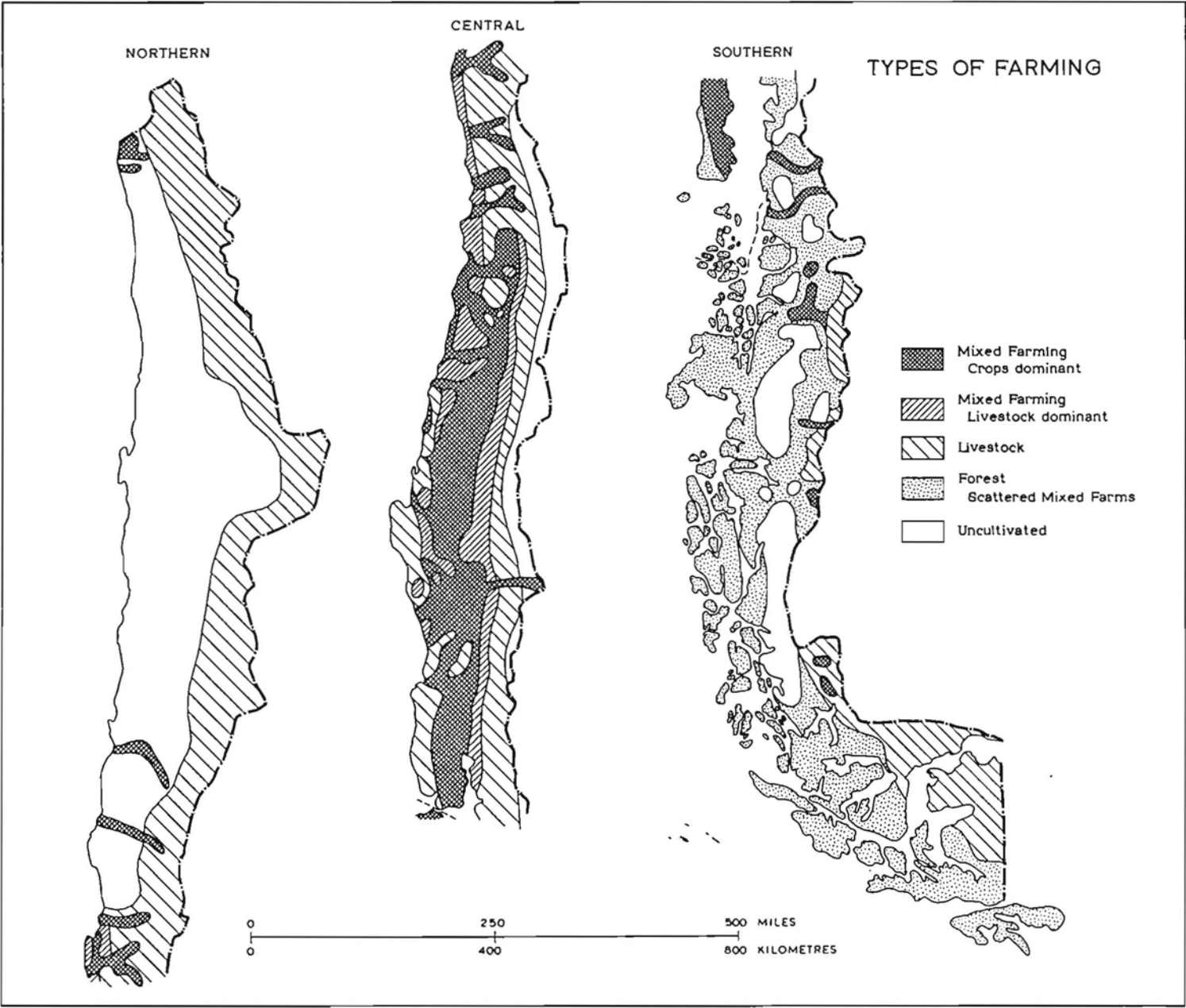
Crop	Area (1,000 ha)		Production (1,000 tons)		Yield (quintals per ha)	
	1950-55	1956-60	1950-55	1956-60	1950-55	1956-60
Wheat . . . . .	769.0	828.9	948.2	1,104.6	12	13
Maize . . . . .	54.8	74.2	82.1	147.0	15	20
Rice . . . . .	28.2	33.9	76.8	85.4	27	25
Barley . . . . .	53.6	61.9	79.7	106.7	15	17
Oats . . . . .	94.0	106.2	96.5	114.3	10	11
Rye . . . . .	7.8	9.3	5.5	7.5	7	8
Total cereals . . . . .	1,007.4	1,114.4	1,288.8	1,565.5	—	—
French beans . . . . .	78.4	86.4	75.8	78.0	10	9
Lentils . . . . .	21.9	30.7	15.5	17.2	7	6
Vetch . . . . .	19.4	15.1	15.4	9.3	8	6
Chick-pea . . . . .	7.5	8.4	4.1	3.9	6	5
Legumes . . . . .	127.2	139.6	110.8	108.4	—	—
Potatoes . . . . .	73.4	84.7	680.7	738.5	93	87
Sugar beet . . . . .	2.4	9.8	41.7	277.3	174	280
Root crops . . . . .	75.8	94.5	22.4	1,015.8	—	—
Garden crops . . . . .	—	—	519.0	711.8	—	—
Edible oils . . . . .	45.8	60.5	58.4	59.0	13	10
Textile fibres . . . . .	5.8	5.5	5.0	4.8	8	11
Industrial oils . . . . .	10.0	9.2	8.2	7.7	80	83
Tobacco . . . . .	2.9	3.0	6.0	6.2	21	21
Fruit . . . . .	—	—	331.4	392.3	—	—
Vines . . . . .	88.9	97.0	3.3 (1)	3.7 (1)	36.8 (2)	38.3 (2)

Source: Ministerio de Agricultura, 1963 (unpublished).

(1) Million hectolitres.  
(2) Hectolitres per ha.







PERCENTAGE PRODUCTION OF PRINCIPAL FOODCROPS, LIVESTOCK AND TIMBER, BY MAJOR REGIONS, 1960

Crop	Desert	Mediterranean	Forest	Archipelagic and Atlantic
Wheat . . . . .	4.0	48.0	47.0	1.0
Maize . . . . .	14.0	82.0	4.0	—
Barley . . . . .	21.0	59.0	20.0	—
Oats . . . . .	—	5.0	93.0	2.0
Rice . . . . .	—	100.0	—	—
French beans . . . . .	3.0	91.0	6.0	—
Potatoes . . . . .	5.0	37.0	43.0	15.0
Vines . . . . .	3.0	96.0	1.0	—
Cattle . . . . .	5.0	37.0	49.0	9.0
Sheep . . . . .	6.0	22.0	16.0	56.0
Pigs . . . . .	4.0	41.0	49.0	6.0
Goats . . . . .	48.0	25.0	26.0	1.0
Timber . . . . .	—	23.0	68.0	8.0

Source: Dirección General de Estadísticas y Censos, 1963.

of packing material, 7,000 tons of hardboard, 7,600 tons of fibreboard and 250,247 tons of cellulose, paper and cartons.

The most important agricultural lands in Chile are still to be found in the Central Valley of the Mediterranean and Forest Regions. More than 79 per cent of all the staple cereals are grown in these two areas and even greater percentages of the vegetable and vine crops. The variations in the shares of the crops grown within these two areas are primarily a reflection of the different climatic regimes. Thus maize, rice, French beans and vines thrive in the warm dry Mediterranean region, while barley and potatoes do better in the cooler, wetter Forest provinces. The greatest percentages of cattle and pigs are to be found in the Mediterranean and Forest regions. Goats thrive best in the dry scrublands of Desert and northern Mediterranean Chile and sheep in the uplands of Archipelagic and Atlantic Chile. The ten provinces of Forest and Archipelagic Chile produce 77 per cent of the country's output of forest products.

Although statistical information is lacking, it is possible to recognize several distinct types of farming in Chile. The majority of Chilean farms have an area of 50 hectares or less. Most of the land is given over to the production of subsistence crops and since the units are generally too small to be economic,

PERCENTAGE DISTRIBUTION OF MAJOR LAND USES  
BY SIZE OF FARMS, 1955

Size group		Arable	Pasture <sup>(1)</sup>	Other uses <sup>(2)</sup>
Under 1	ha . . . . .	59.5	15.5	25.0
1-10	ha . . . . .	44.0	36.9	19.1
10-50	ha . . . . .	28.5	43.7	27.8
50-200	ha . . . . .	23.0	42.9	34.1
200-1,000	ha . . . . .	20.6	39.4	40.0
1,000-5,000	ha . . . . .	12.6	40.9	46.5
Over 5,000	ha . . . . .	1.9	34.4	53.7
Total	. . . . .	16.0	37.3	46.7

Source: Censo Nacional Agrícola y Ganadero, 1955.

the family income is supplemented by part-time work on larger estates. Most of these uneconomic (minifundia) and subsistence (*pequeña propiedad*) farms are to be found in Mediterranean Chile.

Medium-sized farms (50-200 hectares) are found around the cities of Mediterranean Chile, but principally in Forest Chile. Approximately 20 per cent of the cropland is under food crops and the remainder under fodder crops or pasture. Irrigated vineyards are common on farms in the Mediterranean region. Livestock provides 80 per cent of the income of these units.

Large estates account for most of the farm land in Mediterranean and Atlantic Chile. In the arid central region about 10 per cent of the farm area is cultivated, the remainder is arid pasture and scrubland. About 10 per cent of the cultivated land is used for producing food crops, 20 per cent is under commercial crops and the rest is left fallow or used as pasture. Virtually the entire income of these large estates is derived from the sale of livestock. In Atlantic Chile the proportion of cropland is generally insufficient even to produce adequate food supplies. The entire income of farms in this region comes from sales of livestock, wool, hides and other livestock products.

## 5. Agricultural economy

The development of the agricultural sector of the Chilean economy has progressed at a very low rate in the past fifteen years, with an average annual increase of only 1.4 per cent, compared with a national increase of 3.0 per cent per annum.

NET NATIONAL INCOME, 1951 TO 1960  
(in million U.S. dollars)

Year	All sectors	Agriculture	Agriculture as percentage of total
1951	2,720	448	16.2
1955	3,516	555	16.0
1960	3,844	541	14.1

Source: Cifras básicas del Departamento de Planificación y Estudios de la Corporación de Fomento de la Producción, 1961.

<sup>(1)</sup> Temporary and permanent pasture.  
<sup>(2)</sup> Including rough grazing.

In 1960 the sector employed 27.5 per cent of the economically active population, but accounted for only 14.1 per cent of the net domestic income, compared with 16.2 per cent in 1956.

There are large disparities in the occupational distribution of income in Chile. Income per head in the agricultural sector has been consistently lower than in other sectors. In 1960 agriculture's share averaged 207 U.S. dollars per head, compared with the national average of 501 U.S. dollars per head.

INCOME PER HEAD, 1951 TO 1960

Year	National average (U.S. dollars)	Agriculture (U.S. dollars)
1951	440	191
1955	519	226
1960	501	207

Source: Cifras básicas del Departamento de Planificación y Estudios de la Corporación de Fomento de la Producción, 1961.

There are great differences in the distribution of income within the agricultural sector of the Chilean economy. H. Varela discovered that, during the period 1940-54, 92.4 per cent of the economically active agricultural population (agricultural workers and owners of minifundias) received only 41.2 per cent of the income of the agricultural sector and that the *empresarios patronales* (large employer-landowners), who composed only 7.6 per cent of the economically active population, received the remaining 58.8 per cent of the income of the agricultural sector. H. Davies observes that: "This lopsidedness in the distribution of income applies to the whole of the Chilean economy. In 1954, the aggregate earnings of 3 per cent of the earning population (81,000 persons) came to 25 per cent of the national earnings. At the other end of the scale 55 per cent (1,800,000 people) earned a mere 16 per cent of the country's total income". The great discrepancy between the incomes of the hired agricultural workers and small farmers and the large landowners is a matter of concern to the government, which is endeavouring, through its Economic and Social Development Programme, to raise the incomes of the low-income groups. This is a difficult task, since it is impossible to estimate precise average or total incomes for the employed section of the agricultural working population because of important seasonal and regional variations in the practice of paying workers part of their income in cash and the rest in kind.

During the period 1951-60 the value of production in the agricultural and forest sector of the economy increased by almost 400 per cent. The increase was nevertheless lower than that experienced in other sectors of the economy. Over 60 per cent of the gross national product is now accounted for by non-productive activities.

PERCENTAGE INCREASE IN VALUE OF PRODUCTION  
BY MAJOR SECTORS OF ECONOMY, 1951-60

Sector	% increase
Agriculture . . . . .	384.5
Industry . . . . .	495.2
Mining . . . . .	614.3
Imports . . . . .	580.3
All sectors . . . . .	484.8

Source: Ministerio de Agricultura, Departamento Economía Agraria, 1963.



# CHILE

## AGRICULTURAL RETURNS, 1951-55 AND 1956-60

	Average 1951-55		Average 1956-60	
	Million U.S. dollars	%	Million U.S. dollars	%
Cereals . . . . .	107.8	17.7	110.1	19.7
Legumes . . . . .	22.2	3.6	21.1	3.8
Root crops . . . . .	54.0	8.8	54.2	9.7
Garden crops . . . . .	36.2	5.9	39.4	7.0
Edible oils . . . . .	6.7	1.1	6.1	1.1
Vegetables fibres . . . . .	1.2	0.2	1.0	0.2
Industrial oils . . . . .	1.6	0.3	1.5	0.3
Tobacco . . . . .	1.0	0.2	1.1	0.2
Fruit . . . . .	31.9	5.2	34.0	6.1
Vines . . . . .	50.0	8.2	41.5	7.4
Total crops . . . . .	312.6	51.2	310.0	55.5
Meat . . . . .	156.1	25.6	131.7	23.6
Hides etc. . . . .	110.5	18.1	97.1	17.4
Total livestock products	266.6	43.7	228.8	41.0
Timber . . . . .	30.9	5.1	19.4	3.5
Total . . . . .	610.1	100.0	558.2	100.0

Source: Ministerio de Agricultura, Departamento de Economía Agraria, 1963.

A comparison of the quinquennial data for 1951-55 and 1956-60 reveals that the livestock and forest-product sectors have declined in importance, whereas the relative share of crops — particularly cereals — has risen slightly.

Information on the full size of the quota of total production reconsumed by agriculture is unobtainable. Estimates of the costs of production, however, have been produced in recent years. During 1959 the value of agricultural products reached 516.6 million U.S. dollars; costs of production totalled 300 million, leaving a net product of 216.6 million U.S. dollars. This figure contrasts with a net product of only 172.5 million U.S. dollars for the previous year — an increase of 25.6 per cent. The increase was the result of higher productivity and a significant decrease in expenditure.

## COST OF AGRICULTURAL PRODUCTION, 1959-60

	Million U.S. dollars	% of total cost
Seed . . . . .	22.4	7.5
Fertilizers . . . . .	8.5	2.8
Pesticides . . . . .	4.0	1.3
Fuel . . . . .	13.3	4.4
Taxes . . . . .	12.3	4.1
Mortgages . . . . .	62.8	20.9
Conservation . . . . .	36.6	12.2
Interest . . . . .	30.8	10.3
Securities . . . . .	2.0	0.7
Salaries and wages . . . . .	93.6	31.3
Duties . . . . .	13.7	4.5
Total . . . . .	300.0	100.0

Source: Ministerio de Agricultura, Departamento de Economía Agraria, 1960.

The organization of the marketing of agricultural products in Chile is poor, partly because of the physical difficulties experienced in moving goods from one part of the country to another. Thus the three southern provinces produce 56 per cent of the sheep reared in Chile but account for only 2.8 per cent of the national market in terms of population. The deficiencies of the marketing organization seriously affect the distribution of agricultural products — an estimated 25 per cent of fruits and vegetables are spoilt before they can reach the consumer — and the resulting fluctuations in prices make reasonable estimates of crop values, and hence of future needs, extremely difficult.

A number of national, region and local development and marketing agencies have been established in the past twenty years. Some of them operate with a fair measure of success. The dairy, grape-growers' and winemakers' co-operatives are among the most successful. A few government agencies for the promotion and control of specific products have recently acquired importance. E.C.A. (Empresa de Comercio Agrícola) supports the prices of certain products and has acquired regional purchasing powers to prevent sharp declines in the prices of cereals, beans and other important items. The Ministerio de Economía regulates domestic trade and supply and controls the warehousing of the country's agricultural products through its Departamento de Comercio Interno. Three Ministries (Ministerios de Economía, de Agricultura, de Hacienda) are responsible for the promotion and orientation of foreign trade, including the determination of which products will be promoted for export.

Chile ranks seventh among Latin American countries in foreign trade. The U.S.A. is the biggest single market and supplier, taking 33.5 per cent of the exports (by value) and supplying 40.3 per cent of the imports in 1961. Minerals dominate the export trade; in 1962 copper bars, concentrates and manufactures totalled 67.6 per cent of all exports, by value, followed by iron ore (10.6 per cent) and nitrates (5.7 per cent). Receipts from farm exports have declined steadily from 20.7 per cent in 1946 to 7.7 per cent in 1962. This decrease reflects the increase in domestic consumption arising from a growing imbalance between annual rates of increase in population (2.5 per cent) and food production (1.2 per cent). Among the farm exports therefore foodstuffs occupy a much smaller place than they did just after the war.

Among the farm exports oats, wines, fruit, beans and wool are the only significant commodities and they vary in quantity from year to year.

## EXPORTS OF AGRICULTURAL COMMODITIES, 1945-49 AND 1955-59 (as percentage of total value of agricultural exports)

Commodity	1945-49	1955-59
Food grains . . . . .	53.4	30.8
Fruit, wine . . . . .	11.7	15.0
Hides, skins . . . . .	23.3	29.3
Timber, pulp . . . . .	11.0	24.6
Others . . . . .	0.6	0.3

Source: Anuarios de Estadísticas y Banco Central de Chile, 1960.

Agricultural imports have increased very rapidly in the past two decades. Foodstuffs form the major single item, accounting for 93.3 million U.S. dollars in 1960, compared with 23 million U.S. dollars in 1947. Live and chilled beef imports alone were worth nearly double the mean annual value of farm machinery, fertilizers and pesticides combined for the period 1946-50. For

SELECTED AGRICULTURAL PRODUCTS IN FOREIGN TRADE,  
1946-50 AND 1951-55  
(in thousand U.S. dollars)

	Average annual value 1946-50		Average annual value 1951-55	
	Imports	Exports	Imports	Exports
Wheat . . . . .	4,135.8	692	16,727.9	—
Maize . . . . .	9.9	—	7.4	—
Beans . . . . .	10.2	6,467.1	3.3	4,466.0
Livestock and products .	14,638.5	10,310.5	24,797.5	13,271.6
Vegetable oils and oilseeds	3,497.2	—	5,526.1	—
Wines . . . . .	—	1,877.2	—	1,211.8
Farm machinery, fertili- zers and pesticides .	5,447.7	—	14,513.2	—

Sources: Ministerio de Agric., La Agricultura Chilena en el Quinquenio 1951-55; Tercer Censo Nacional Agrícola y Ganadero, 1955.

the period 1951-55 the mean annual value of beef imports was still very high (11.5 million U.S. dollars) compared with the investment in farm equipment (14.5 million).

Chile has an adverse balance of trade, although the figures suggest otherwise. The primary reason for the concealed deficit is that the proceeds of two of the main exports — copper and nitrate — do not become available for imports.

The widening gap between the value of exported and imported agricultural products has also contributed to the unfavourable situation.

The adverse balance reached a maximum of 89.6 million U.S. dollars in 1964.

FOREIGN TRADE, 1950 TO 1962  
(in million U.S. dollars)

Year	Exports		Imports	
	Total	Agriculture	Total	Agriculture
1950	283.3	36.5	247.3	68.2
1955	475.1	36.2	376.3	115.8
1960	490.0	30.4	412.8	83.1
1962	532.1	40.4	517.6	...

Source: Banco Central de Chile, Boletín Mensual, 1961-63.

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