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REPORT BY THE GOVERNMENT OF CHILE ON THE
SITUATION IN THE SOUTH OF THE COUNTRY AND
ON THE RECONSTRUCTION PROGRAMME IN COURSE
OF PREPARATION

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NOTE BY THE SECRETARIAT

The secretariat has the honour to transmit to the Governments of States members of the Commission herewith the report which the Government of Chile prepared at its request on the situation in the country as a result of the earthquakes which devastated the southern zone on 21 and 22 May, on the reconstruction programmes which are in course of preparation and on the emergency technical assistance programme which will be necessary in 1960, 1961 and 1962. In submitting this document for the consideration of the Committee of the Whole at its extraordinary session, the secretariat wishes to draw the attention of member Governments to the magnitude of the problems deriving from the catastrophe that has befallen Chile and to the need for adopting measures of international co-operation in view of the calamitous scale of the damage.

PERU



AREA AFFECTED BY EARTHQUAKES AND SEAQUAKES

BOLIVIA

ARGENTINA

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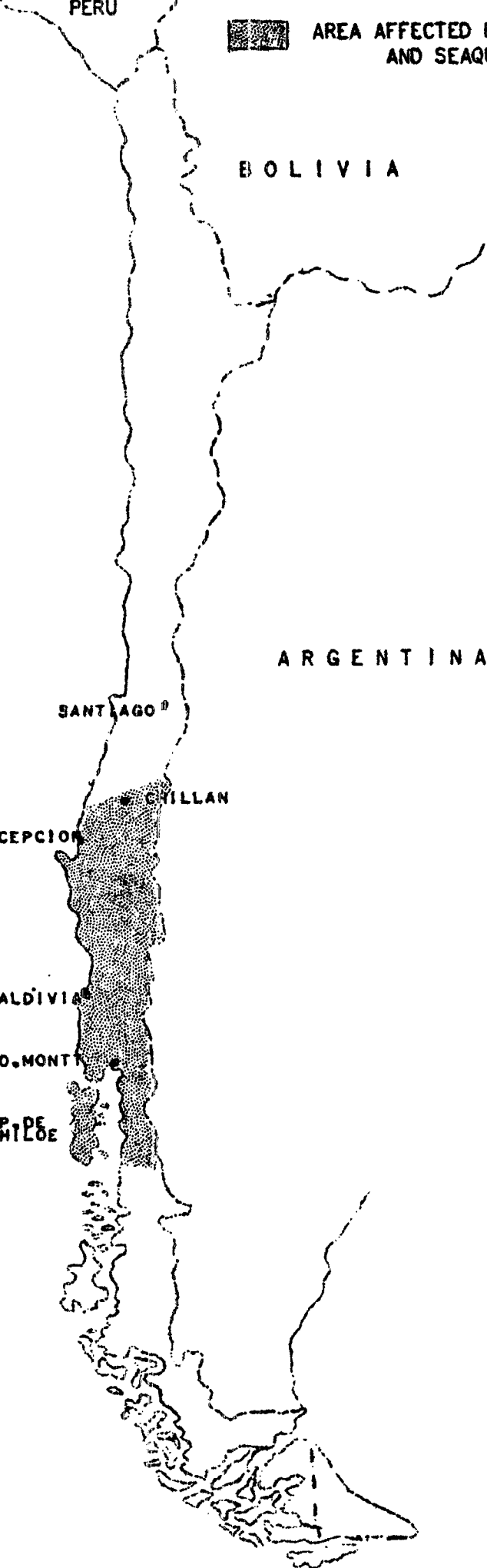
CHILLAN

CONCEPCION

VALDIVIA

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CHILDE



REPORT ON THE EARTHQUAKES, SEAQUAKES AND FLOODS WHICH HAVE OCCURRED IN CHILE, SUBMITTED BY THE GOVERNMENT OF THE REPUBLIC OF CHILE AT THE REQUEST OF THE SECRETARIAT OF THE ECONOMIC COMMISSION FOR LATIN AMERICA

I. DESCRIPTION OF THE CATASTROPHE

On 21 May 1960, at 6.02 a.m., an earthquake of magnitude $7 \frac{3}{4}$ (Richter scale) took place in Chile. Its epicentre was in the peninsula of Arauco, south of the town of Concepción. Other disturbances in the neighbourhood of magnitude 9 on the International or Mercalli scale were also recorded in that area.

On the following day, 22 May, at 3.10 p.m., a major earthquake occurred in a zone 500 kilometres further south, the epicentre of which has not yet been plotted. It is thought that in actual fact there were two earthquakes: the first, of magnitude $7 \frac{1}{2}$ at 3.10 p.m., in the island of Chiloé, and the second half a minute later, at the latitude of Valdivia, with a magnitude of over $8 \frac{3}{4}$ degrees (Richter scale). The latter is one of the severest earthquakes ever recorded. At various points in the Valdivia area, it reached intensity 11 on the International or Mercalli scale.

At the same time, a seaquake developed off the coast of that area and proceeded to move across the Pacific extending as far as the Arctic and Indian oceans. It wrought the greatest damage in Puerto Saavedra, Corral, Ancud and Castro. Further north, in front of the Arauco peninsula, the wave changed its course and the ports in the bay of Arauco were spared from its effects. It was no higher than 1.50 metres at Valparaiso but at the islands of Juan Fernández - which lie at the same latitude as Valparaiso - it exceeded 7 metres. It crossed the Pacific at normal speed and was recorded at Hawaii 16 hours after the earthquake in Chile.

The United States Department of the Navy, Hydrographic Office, duly alerted the central system at Honolulu, but the alarm was inadequate in Hawaii and Japan. Californian ports were also heavily damaged by the

/seismic wave

seismic wave or seaquake.

The numerous earthquakes which have devastated the area between Ñuble and Chiloé since the middle of May may be classified as among the most calamitous within memory. The force of the earthquakes, followed by violent seaquakes, totally or partially destroyed thousands of dwellings and left a large part of the population of those provinces from one moment to the next without a roof over their heads, exposing them, in addition, to the full force of the harsh southern winter and the incessant rain. The destruction of all these dwellings was accompanied by the collapse of a large number of schools, industrial installations, public and commercial buildings, hospitals and warehouses, etc.

In some parts the level of the ground sank several metres and in others it rose appreciably; as a result the coastline and river basins were changed in various places. The cataclysm also struck local power plants, drinking water and sewer systems, railways and port installations, causing, in the first few days, indescribable panic that was fanned by the outbreak of fires and the threat of erupting volcanoes and overflowing lakes.

According to the Institute of Geophysics and Seismology (Instituto de Geofísica y Sismología) of the University of Chile, the southern coast of Chile has experienced serious changes in level. In Valdivia, for example, the ground has sunk as much as 4 metres and in Arauco, 300 kilometres further north, it has been pushed up but on a smaller scale which has been so far impossible to measure. Subsidences ranging from 1 to 4 metres are frequent between Puerto Saavedra and Chiloé.

The floods that covered large tracts of land, caused by the subsiding of the earth and heavy downpours, left many villages completely isolated and cut them off for several days from any help that was forthcoming from less devastated areas. In addition to this terror, the people's plight was rendered even more distressing by the shortage of food and clothing and the outbreak of illness, especially among the children.

/The waves

The waves dragged out to sea the ruins piled up by the earthquakes, caused cargo ships to run aground and sank nearly all the tiny boats owned by local fishermen.

The big landslides occurred mainly in the lake district (provinces of Cautín, Valdivia, Osorno and Llanquihue). Between this area and the coast the earthquakes varied considerably in intensity. Banks and other unsettled ground along the coast subsided and crumbled. In the vicinity of the lakes, hills slid down into the natural water outlets and dammed them up. The most serious case is that of Lake Ríñihue, 90 kilometres from Valdivia. At the time of writing, the situation caused by the damming-up of the lake's outlet is becoming really dangerous.

The earthquake of 22 May caused the ground on the north bank of the San Pedro, the natural outlet of Lake Ríñihue, to shift in several places, creating three barriers which obstructed the river. As a result, the water flowing into Lake Ríñihue from five other tributary lakes is causing the level of the lake to rise at the rate of 35 to 40 centimetres a day and up to 70 centimetres on rainy days. Shortly after these landslides occurred engineers and construction units from the Empresa Nacional de Electricidad (ENDESA), in co-operation with other public and private bodies, started emergency operations to control the flow of the huge quantities of water accumulating in Lake Ríñihue and its tributary lakes.

Had this not been done, the additional volume of pent-up water would have reached 3,500 million cubic metres by the end of July when the level would have risen to 27 metres above normal. The rapid spillage of so much water would have caused the spate of the San Pedro to increase to about 20,000 cubic metres per second, a figure which would have dropped to 3,000 cubic metres per second 70 hours later. To give some idea of the extent of this increase, it might be pointed out that the maximum rate registered in the immediate vicinity of the lakes during the past hundred years was about 2,000 metres per second.

/The purpose

The purpose of the work now under way is to seal off the outlets from Lakes Calafquén, Pirehueico and Panguipulli, to provide channels for the water flowing over the three barriers and to build a rubble dike downstream from the third barrier. This would reduce the additional volume of water in the lake to 1,400 million cubic metres and the maximum rate of flow, allowing even for the most severe erosion, would then be between 5,000 and 7,000 cubic metres per second instead of 20,000. While there is no precedent on which to base estimates of the level of flooding in Valdivia, it is felt that such an increase would cause the river to overflow, seriously damaging the neighbouring agricultural region.

To judge from the present stage of progress of the work under way and according to an estimate of the probable precipitation, the lake will begin to flow over the third barrier on about 28 June. This obviously represents a grave threat to the valuable agricultural and livestock area and to the populated centres below these lakes, particularly the industrial city of Valdivia. The inhabitants of the area are being evacuated by the authorities and, as a result of the measures taken, no deaths or injuries are expected.

Volcanic activity was confined to Puyehue; on the slopes of this volcano a fissure appeared which erupted violently two days after the seismic shocks. Other volcanoes in the area were also unusually active in the days following the earthquakes. The explosive phase of the volcanoes lasted a few hours and the activity has been gradually subsiding.

Since 21 and 22 May various shocks have been and are still being registered, with epicentres spread throughout the southern zone between Concepción and the province of Aysén. Two of the severest were recorded in the area of Taitao peninsula, south of Puerto Aysén. At 10.02 p.m. on 19 June - one month later - another earthquake occurred, again affecting the area from Concepción to Chiloé. Fortunately, only minor damage was done.

/According to

According to the Institute of Geophysics and Seismology of the University of Chile, seismic activity in the Concepción area is likely to cease completely within a month as from 15 June. The succession of several severe earthquakes in a relatively small area of the earth's crust and within a period of only two days constitutes a combination of unusual developments which justify classifying the phenomena that have occurred in our country as an altogether exceptional catastrophe.

Fortunately, in spite of the severity of the earthquakes and seaquakes, the number of dead and missing has been relatively small owing to the following causes: (a) the earthquake at Concepción, which occurred the day before the violent quake at Valdivia and Chiloé, alerted the entire population of the south to the possibility of further upheavals; (b) the severe earthquake of 22 May occurred on a Sunday afternoon when a large number of the inhabitants were out in the squares and avenues, making the most of a day of sunshine that is unusual during the winter; moreover, it was preceded by a severe tremor which caused people to leave their homes and places of entertainment. As a result, when the second and more destructive quake occurred, most of the people were out in the streets away from the debris of tumbling buildings.

An atmosphere of confusion and anxiety prevailed in the hours following the cataclysm. Electric power was cut off, causing the suspension of telegraph, telephone and radio communications in the stricken area. Moreover, bad weather made flying difficult and stopped road and rail traffic.

The Government immediately adopted emergency measures to establish contact with the stricken area as soon as possible. With the help of the armed forces, the airlines, the Red Cross and Civil Defense, and mastering the efforts of the entire population, some essential services were gradually restored and first-aid and emergency housing provided for the families most severely affected. The generous assistance of friendly States began to arrive shortly afterwards.

/II. ECONOMIC

II. ECONOMIC IMPORTANCE OF THE STRICKEN ZONE

1. Area

The zone affected by the earthquakes, floods and seaquakes is 750 kilometres long, i.e. almost as long as the United Kingdom or Spain. Its total area is 140,433 square kilometres, which although only 19 per cent of the total area of Chile, is of far greater importance than its size would indicate, since it comprises 65 per cent of the country's arable land.

2. Population

The total number of persons living in the area at the time the earthquakes occurred is estimated to be 2,386,000, i.e. 31 per cent of the entire population of Chile, with a population density of 17 persons per square kilometre. Fifty-two per cent live in rural districts and the remainder in towns. The distribution by provinces is given in table 1. Whereas the urban population of the area comprises only 23 per cent of the total number of town-dwellers in Chile, the corresponding proportion of the rural population is 47 per cent.

The active population in those provinces, estimated at 799,000 persons, represents 34 per cent of the total population of the area and 30 per cent of the total active population of Chile. Of the active population in the region, 43 per cent are engaged in crop and stock farming, 8 per cent in business, 15 per cent in industry, 6 per cent in other activities that produce goods and 28 per cent in services.

Farming employs 341,000 persons, which constitute 49 per cent of the national total engaged in this activity. A break-down of this sector by employment status is given in table 2.

The number of people employed in manufacturing industry amounts to 118,000, i.e. 24 per cent of all those so employed in Chile.

/Table 1

Table 1

TOTAL URBAN AND RURAL POPULATION OF THE PROVINCES AFFECTED BY
THE EARTHQUAKES, FLOODS AND SEAQUAKES, 1960

Province	Total	Urban	Rural
Ñuble	279 812	101 289	178 523
Concepcion	583 111	476 926	106 185
Arauco	87 534	28 420	59 114
Bio-Bio	161 219	54 394	106 825
Malleco	176 254	73 577	102 677
Cautin	370 848	137 759	233 089
Valdivia	303 015	122 733	180 282
Osorno	150 167	70 687	79 480
Llanquihue	170 971	62 423	108 548
Chiloe	103 925	22 497	81 428
Total	2 386 856	1 150 705	1 236 151

Source: Economic Research Section (Sección Investigaciones Económicas) Department of Planning and Studies (Departamento de Planificación y Estudios) Development Corporation. (Corporación de Fomento de la Producción, CORFO).

/Table 2

Table 2

ACTIVE AGRICULTURAL POPULATION IN THE PROVINCES AFFECTED BY THE
EARTHQUAKES, FLOODS AND SEAQUAKES, CLASSIFIED
BY EMPLOYMENT STATUS 1960

Province	Total	Employers	Self-employed	Employees	Manual workers
Ñuble	53 448	1 443	13 576	1 710	36 719
Concepcion	27 819	1 001	6 788	946	19 084
Arauco	14 777	355	3 650	340	10 432
Bio-Bio	29 898	957	5 950	1 136	21 855
Malleco	27 419	658	8 418	905	17 438
Cautin	64 970	1 689	30 016	1 624	31 641
Valdivia	40 429	1 455	10 148	1 374	27 452
Osorno	23 621	1 346	4 535	874	16 866
Llanquihue	32 113	1 156	12 845	642	17 470
Chiloe	26 108	104	16 735	131	9 138
Total	340 602	10 164	112 661	9 682	208 095

Source: Economic Research Section, (Sección Investigaciones Económicas), Department of Planning and Studies, (Departamento de Planificación y Estudios), Development Corporation, (Corporación de Fomento de la Producción - CORFO).

/3. Capital

3. Capital

In the stricken area, 28 per cent of all Chile's assets are to be found, or, to be more specific, 40 per cent of the total fixed capital in agriculture (buildings, equipment and machinery) and 28 per cent of that in manufacturing industry. The fixed assets in the area concerned have a replacement value of over 4,100 million, 250 million and 850 million escudos ^{1/} respectively.

A brief examination of the investment in agriculture, housing and energy will be useful at this juncture. The type and percentage of buildings and equipment used in farming in relation to the total figures for Chile are indicated below:

Item	As a percentage of the country total
Stables	64
Sheds	63
Warehouses	43
Ox and horse-carts	74
Light and heavy lorries	46
Tractors	44
Reapers	70
Fixed threshers	66
Ploughs	57

The buildings and equipment mentioned are distributed by provinces in the proportions indicated in table 3.

The fixed capital of the area consists of 192,000 and 165,000 urban dwellings, representing 48 and 22 per cent respectively of the national total of urban and rural units. Their break-down by provinces is shown in table 4.

^{1/} For the purpose of calculating in terms of dollars, it should be remembered that one escudo is virtually equivalent to a dollar.

Table 3
PRINCIPAL AGRICULTURAL BUILDINGS AND EQUIPMENT IN THE AREA AFFECTED BY THE EARTHQUAKES,
FLOODS AND SEQUAKES, CLASSIFIED BY TYPES AND PROVINCES

Province	Stables (cow ca- pacity)	Sheds (square metres)	Ware- houses (square metres)	Ox- carts	Open and closed horse- carts	Heavy and light lorries	Tractors Reapers	Thresh- ers	Floughs	(Units)	
Ñuble	15 531	539 436	471 801	14 017	2 552	523	535	119	381	19 253	
Concepcion	14 550	159 387	254 893	6 635	519	235	197	39	97	5 841	
Arauco	3 726	81 852	45 639	4 917	389	71	50	32	123	3 372	
Bio-Bio	51 142	377 421	312 611	9 212	2 271	346	568	160	344	9 040	
Malleco	15 645	363 453	221 243	8 721	2 377	372	649	227	324	10 624	
Cautin	36 615	741 162	387 626	27 576	5 742	708	1 150	449	778	32 440	
Valdivia	30 521	530 252	341 258	16 046	2 923	742	953	527	478	10 911	
Osorno	19 159	565 865	239 094	7 524	1 445	606	698	446	420	6 341	
Llanquihue	21 634	567 433	261 416	3 887	2 010	437	633	378	400	6 758	
Chiloe	33 349	214 609	97 310	3 243	833	78	17	33	110	5 716	
Total	221 872	4 140 872	2 632 891	101 778	21 061	4 118	5 450	2 410	3 455	110 296	

Source: Statistical and Census Department (Dirección de Estadística y Censos), Third National Crop and Live-stock Census, 1955.

Table 4

URBAN AND RURAL DWELLINGS IN THE PROVINCES AFFECTED BY
THE EARTHQUAKES, FLOODS AND SEAQUAKES, 1960

Province	Total	Urban	Rural
Ñuble	45 911	18 161	27 750
Concepcion	75 090	58 159	16 931
Arauco	12 292	3 952	8 340
Bio-Bio	23 540	8 480	15 060
Malleco	27 743	11 900	15 843
Cautin	63 260	22 952	40 308
Valdivia	40 592	16 131	24 461
Osorno	21 221	9 225	11 996
Llanquihue	24 203	8 280	15 923
Chiloe	18 569	3 264	15 305
Total	352 421	160 504	191 917

Source: Economic Research Section, (Sección Investigaciones Económicas)
Department of Planning and Studies, (Departamento de Planifica-
ción y Estudios) Development Corporation, (Corporación de Fo-
mento de la Producción, CORFO).

/Table 5

Table 5 indicates the way in which rural dwellings are distributed by provinces in accordance with the employment status of the inhabitants.

The fixed assets of the area also include an installed electric power capacity for public utilities of as much as 188,000 kW, i.e. 31 per cent of the national total.

The provinces covered by this report contain 310,000 hectares of timber plantations and 2,130,000 hectares of natural forest, which constitute 74 and 59 per cent respectively of Chile's reserves.

The livestock in the area is composed of 490,000 pigs, 1,590,000 head of cattle and 220,000 horses, representing 50, 61 and 38 per cent of the respective country totals. The break-down by provinces is indicated in table 6.

4. Income and production

The income generated in the area is approximately 24 per cent of the total for Chile and amounts to 970 million escudos annually.

In general terms, the area contributes 38 per cent of the country's crop and livestock production, its output of peas, beetroot, milk, wheat, potatoes and lentils being of prime importance. Of the totals consumed in Chile, 83 per cent of the peas, 98 per cent of the beetroot, 64 per cent of the milk, 61 per cent of the wheat, 62 per cent of the potatoes and 55 per cent of the lentils originate in the provinces under review.

The enterprises in the area are responsible for 28 per cent of Chile's manufacturing production. Their contribution exceeds local consumption and supplies the rest of Chile with certain types of food, textiles and timber, newsprint, non-metallic minerals and basic metal products.

/Table 5

Table 5

FARM DWELLINGS IN THE PROVINCES AFFECTED BY THE EARTHQUAKES,
FLOODS AND SEAQUAKES, BY EMPLOYMENT STATUS, 1960

Province	Total	Employers' dwellings ^{a/}	Tenants' dwellings
Ñuble	14 509	12 077	2 432
Concepcion	6 978	5 642	1 336
Arauco	4 116	3 296	820
Bio-Bio	6 896	5 093	1 803
Malleco	7 910	6 957	953
Cautin	25 657	23 541	2 116
Valdivia	12 384	8 808	3 576
Osorno	6 452	4 684	1 768
Llanquihue	11 862	10 569	1 293
Chiloe	12 779	12 646	133
Total	109 543	93 313	16 230

Source: Economic Research Section, (Sección Investigaciones Económicas) Department of Planning and Studies, (Departamento de Planificación y Estudios) Development Corporation, (Corporación de Fomento de la Producción, CORFO).

^{a/} Including dwellings of self-employed employees and manual workers.

Table 6

PRINCIPAL LIVESTOCK IN THE PROVINCES AFFECTED BY THE EARTHQUAKES,
FLOODS AND SEAQUAKES, 1960

Province	Pigs	Cattle	Horses
Ñuble	66 315	136 017	37 143
Concepcion	20 153	52 974	12 267
Arauco	15 622	66 112	6 552
Bio-Bio	28 313	104 192	22 547
Malleco	43 657	132 678	18 656
Cautin	138 164	340 924	55 667
Valdivia	53 274	291 720	25 349
Osorno	45 384	207 716	14 084
Llanquihue	50 598	180 641	15 667
Chiloe	31 497	83 657	14 080
Total	492 977	1 596 631	222 012

Source: Statistical and Census Department (Dirección de Estadística y Censos), Third National Crop and Livestock Census, 1955.

/The following

The following figures indicate the importance of certain commodities typical of the area as percentages of total national production.

Item	Percentage of the corresponding country total
Condensed and powdered milk	100
Cheese	95
Wheat flour	12
Woollen cloth	80
Sawn wood	93
Newsprint	89
Chinaware and ceramics	80
Plate glass	100
Pig iron	100
Steel plate (thick, thin and tinplate)	100
Steel bars	85

5. Tourist industry

Lastly, mention should be made of the region's importance as a tourist attraction in view of its magnificent scenery, such as the innumerable lakes and rivers strategically placed between mountain chains and surrounded by virgin forests with many varieties of trees native to Chile. These advantages, together with the presence of large numbers of freshwater fish, attracted a flow of tourists from Chile itself and from abroad which will now be seriously affected by the havoc wrought and by psychological factors which it will take many years to overcome.

/III. PRELIMINARY

III. PRELIMINARY ESTIMATE OF DAMAGE

The Development Corporation (CORFO) was instructed by the Government to assess the damage done. The calculations are now being made with the co-operation of several public and private agencies as well as international institutions represented in Chile, and the work is expected to be finished within a few weeks. The survey covers housing, town planning, roads, railways, bridges, harbours, schools, hospitals, public and commercial buildings, hygiene, communications, investment in agriculture and industry, etc.

The cities most severely damaged were Valdivia, Puerto Montt, Ancud and Castro, where losses of dwellings, industries, commercial buildings, etc., were increased by sinking ground, wide fissures and floods; to make things worse, they were cut off from the rest of the country by the destruction of roads, railways and harbours. Moreover, small ports such as Corral Bajo, Puerto Saavedra and others were virtually wiped out by seaquakes.

While practically no specific figures on damage and replacement costs can be given as yet for obvious reasons, preliminary estimates based on surveys and spot checks carried out by CORFO and other agencies place the cost of replacing the capital invested in the area at some 550 million escudos. This includes destroyed property, equipment and installations, resources such as livestock, forests, merchandise, shell-fish beds, sown fields and crops, and a paralysis of industrial, agricultural, commercial and transport activity in the area lasting for several weeks. The above figure also includes an estimate of the cost of reclaiming new land to replace the vast agricultural stretches along the sea-coast or river banks which have been flooded or washed away.

Housing accounts for the major share of the replacement cost. According to preliminary estimates by the Housing Corporation, the Economic Institute of the University of Chile, the Ministry of Agriculture and the Development Corporation, 20,000 urban and 30,000 rural dwelling units, or some 50,000 units in all, were completely destroyed. To this must be added the cost of repairing over 100,000 units. To judge from current building prices and on the basis of an estimate of the minimum area required for the various social levels affected, some 300 million escudos, including a modest outlay for furniture and household equipment, will have to be spent under this heading. This will enable units to be rebuilt to house over 300,000 victims of the disaster and repairs to be made to houses at present occupied by over 600,000 persons.

Preliminary estimates of the damage done to agriculture and industry amount to over 80 million escudos in terms of replacement value alone.

The damage to public and private buildings, including hospitals and schools needing repairs, is estimated at over 50 million escudos, including the replacement cost of equipment, furniture and fixtures.

Transport losses - railways, roads, bridges, harbours and so forth - are in the neighbourhood of 30 million escudos, according to preliminary estimates made by the Ministry of Public Works and the State Railways.

Lastly, losses of investments in drinking water, drains, road surfacing in urban areas, communications, coal mines, ships and fishing boats, electrical plants, and others smaller in magnitude, amount to about 20 million escudos.

Hence, the replacement cost of the items under the various headings mentioned may be summarized as follows:

	<u>Millions of escudos</u>
Housing (including furniture and household equipment)	300
Agriculture and industry	80
Public and private buildings	50
Transport	30
Miscellaneous	<u>20</u>
Total	<u>480</u>

/This amount

This amount would easily rise to 550 million escudos if losses in respect of agricultural, livestock, industrial and mining capital, profits that can no longer be made, and the cost of reclaiming land that has either been flooded or washed away are included.

To give an idea of what this figure means for a country like Chile, suffice it to point out that the annual gross investment during the past few years has been very slightly over 300 million escudos, including the investment of foreign private capital and machinery and equipment imported on long-term credit.

/IV. RECONSTRUCTION

IV. RECONSTRUCTION AND ITS FINANCING

Chile has been suffering in the last five years from acute inflation which has had adverse repercussions on the national economy. As soon as it came to power in November 1958, the Government of President Jorge Alessandri introduced a strict policy to check inflation. The efforts made to curb it have had positive results. For the last ten months there have been no fluctuations in the cost-of-living index; in other words, for the first time in many years, real and effective price stabilization has been achieved in Chile.

Industrial output indices for 1959 and the early months of 1960 bear witness to the revival in the Chilean economy. Average industrial production in 1959 was 16.3 per cent higher than in 1958, which represents a remarkable increment. Similarly, the index of industrial employment, measured in terms of workers employed, was 3.5 per cent above the previous year's level. Finally, industrial consumption of electric energy also showed an increment of 14.6 per cent over the figure for 1958.

While the measures in question were being applied, the Government, through the Development Corporation, was preparing an Over-all Economic Development Programme (Programa General de Desarrollo Económico) for the next decade which had reached the stage of final revision and in which it is anticipated that the annual rate of increase of the gross national product will rise from 3.5 per cent to 5.5 per cent as a result of clear-cut sectoral programmes for public works, agriculture, industry, energy and fuels, housing, etc. In the assignment of priorities due heed was taken of the need for the balanced development of all sectors.

The implementation of the over-all programme calls for a national effort at organization in the public and private sectors and for an increment in investment capacity in order to raise the latter's annual rate from 10 to 18 per cent above that of the gross national product. In order to

/attain this

attain this increment, it was considered essential to increase internal savings substantially and at the same time to enlist large-scale external co-operation in order to supplement the financing of specific projects. This co-operation should be extended in the form both of private investment and of credits for the public and private sectors. Such financial co-operation from abroad was confidently anticipated, as the Government and people had clearly indicated their readiness to spare no effort in rehabilitating the national economy by effectively dealing with and curbing inflation.

When the calamity occurred, the Government of Chile instructed the Development Corporation to formulate an Emergency Reconstruction Plan, to be co-ordinated with and integrated into the Over-all Programme mentioned earlier by adjusting the latter to conform to the exigencies of the emergency.

At the same time an inventory was taken of Chile's productive resources, the manpower which the seven universities and technical colleges could make available, the financial resources deriving from domestic savings in all sectors of the community, and the technical assistance currently provided by international bodies.

The conclusion was reached that the needs arising from the catastrophe far exceeded these resources. The fact is that no country at the same stage of development as Chile could by itself cope with so great a calamity.

The Chilean Government has planned a series of economic and financial measures which, by means of ad hoc legislation, will make it possible to face up to the situation through effective organization and a superlative effort of national solidarity. Some of these measures are designed to obtain a first-stage domestic savings contribution of some 150 million escudos (approximately 150 million dollars), to be provided by those sectors which are in the best economic position to do so in the present emergency. However, in view of the great losses sustained

/and the

and the country's limited savings capacity, Chile will have to enlist the co-operation of international credit agencies and of the financial co-operation bodies of friendly Governments in order to supplement the amount required under the Emergency Reconstruction Programme. It is estimated that Chile will have to obtain some 200 million escudos (about 200 million dollars) from foreign sources in order to cover immediate needs. The gap between the amount of domestic savings plus foreign aid and the total of the losses sustained will have to be bridged by an increase in economic activity which must take place, and by the proceeds of a new domestic savings drive and more foreign aid.

Moreover, at the suggestion of and in consultation with executive officers of ECLA, FAO and other United Nations agencies, as well as of the Organization of American States and the United States Operations Mission (Point IV), an Emergency Technical Assistance Programme has been formulated, an outline of which is attached as an annex to this report. It is to be submitted through the usual channels to the agencies mentioned, which generally provide this type of co-operation. This Emergency Programme has been duly co-ordinated with the United Nations Expanded Programme of Technical Assistance for 1961-62 drawn up by the Chilean Government, whose representatives on these agencies participated in the consideration of the latter Programme. The Emergency Programme includes Chile's requirements in terms of experts, missions, equipment and instruments amounting to more than 4 million dollars over a period of three years. The portion relating to the group of United Nations bodies consists of 90 experts and totals 2.2 million dollars to be used in the years 1960, 1961 and 1962.

Generally speaking, the services of geologists, seismologists, economists, town and country planners, experts in soil mechanics, reclamation of flooded areas, fishing co-operatives, sawmills and forestry management, aerial surveys, telecommunications, inter alia, are required.

/The Government

The Government of Chile is fully aware of the fact that the immense reconstruction task cannot be carried out without the efficient mobilization of the all-out efforts of every sector of the community, but it realizes at the same time that substantial foreign financial and technical co-operation will be required in order to complete the projects within reasonable time limits.

The Chilean Government is further determined to face the emergency while maintaining unchanged its clear-cut, specific stabilization policy. It is convinced that, unless it does so, it cannot successfully complete the work of economic reconstruction and development so earnestly desired by the people of Chile.

In concluding this report and in acquainting the States members of ECLA with the facts regarding the calamity that has befallen the south, the Chilean Government cannot refrain from expressing the emotion and pride it feels at the admirable fortitude and high morale of the inhabitants of the stricken area who have never wavered in their efforts to overcome the tragic events in which they have been involved and to undertake the huge task of reconstruction with renewed vigour.

Annex

T E C H N I C A L A S S I S T A N C E

EMERGENCY PROGRAMME FOR CHILE IN 1960 - 1961 - 1962 SUBMITTED TO
THE UNITED NATIONS, ITS SPECIALIZED AGENCIES, THE ORGANIZATION OF
AMERICAN STATES AND THE UNITED STATES OPERATIONS MISSION

	TAO	ITU	WMO	ILO	FAO	UNESCO	ICAO	WHO	IAEA	IMF		
1960	47,200	-	-	26,300	167,400	40,000	10,575	85,200	-	3,900	380,575	Annual total
1961	370,400	16,100	18,200	105,000	303,600	302,800	14,100	38,600	-	-	1,168,800	Annual total
1962	68,600	-	-	65,200	106,400	143,600	-	46,600	-	-	430,400	Annual total
Total	486,200	16,100	18,200	196,500	576,400	486,400	24,675	170,400	-	3,900	1,978,775	Total for the Programme
											221,225	Contingencies
											2,200,000	Total requested
Experts	29	1	1	11	24	15	4	4	-	1	90	Number of Experts

Organization	Sub. No.	Date of completion	Total project cost			Experts				Fellows				Equipment and Supplies								
			1960	1961	1962	1960		1961		1962		1960		1961		1962		Activity	1960	1961	1962	
Project title			Cost	Cost	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost					Cost
UNFPAO	130-57		26.80	197.80		3/18	22.80	3/18	22.80													
Industrial Development and Productivity						3	4.00	3	3.60													
Economic planners (CORFO) / Manpower economist (CORFO)																						
Analysis of manpower (University of Chile, CORFO)						12	17.20															
Industrial production, agricultural implements (CORFO)						6	7.60															
Natural resources: chemicals for industry (CORFO)						12	17.20															
Location of the aluminium industry (CORFO)						12	17.20															
Quality control in industry (U. of Concepción)						12	17.20														95.00	

Organization	Sub. No.	Date of completion	Total project cost			Experts						Fellows				Equipment and supplies											
			1960	1961	1962	Post title	1960		1961		1962		Field of study	1960		1961		1962		Activity	1960	1961	1962				
Cost	Cost	Cost	No. of months	Cost	No. of months		Cost	No. of months	No. of months	Cost	No. of months	Cost		No. of months	Cost	No. of months	Cost	No. of months	Cost		No. of months	Cost	Cost	Cost	Cost		
ILO 231-54 Manpower Or- ganization including Vocational Training			26.30	105.00	65.20	On-the-job training of manual workers (Conception)	6	7.80	12	15.60																	
						Instructor	4	6.40	4	6.40																	
						Engineering Training Centre	8	9.20	12	13.80																	
						Electrical and oxy-acetylene welding instructor	8	9.20	12	13.80																	
						Electricity instructor	4	4.60	6	6.90																	
						Carpentry instructor	4	4.60	6	6.90																	
						Plumbing instructor	4	4.60	6	6.90																	
						Plastering instructor	4	4.60	6	6.90																	
						Bricklaying instructor	4	4.60	6	6.90																	

Equipment for emergency workshops:
Carpentry 2.0
Plumbing 2.0
Plastering 2.0
16.00

Organization	Sub. No.	Date of completion	Total project cost			Experts						Fellows				Equipment and supplies											
			1960	1961	1962	1960		1961		1962		1960		1961		1962		1960	1961	1962							
Project title	Post title	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	Field of study	No. of months	Cost	No. of months	Cost	Activity	No. of months	Cost	No. of months	Cost		
ILO 231-54 (cont'd)	Adviser on training of industrial engineers (U. of Concepción UFSM) 1/ Advisers for Manpower Studies under ECLA resolution 149 (VIII) ILO - UNESCO OAS - ICEM (CORFO) Manpower statistics (CORFO)	3		6	7.80	12	15.60																				
TOTAL, ILO 196.500	11 experts	19	26.30	70	85.00	52	65.20																			4.00	20.00

Organization	Sub. No.	Date of completion	Total project cost			Experts						Fellows						Equipment and supplies		
			1960	1961	1962	1960		1961		1962		1960		1961		1962		1960	1961	1962
Project title	Post title	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	Activity	Cost	Cost	Cost	
UNESCO	Seismology (U. of Chile)	12	15.60	12	15.60											Seismological equipment to extend the network of seismological stations. Institute of Geophysics (U. of Chile)	20.00			
h1-60	Volcanology (U. of Chile)	6	7.80	6	7.80															
Assistance to universities	General Physics (U.T.F.S.M.) (Universidad Técnica "Federico Santa María")	12	15.60	12	15.60															
	Theoretical Physics (U. of Concepción)	6	7.80	6	7.80											Re-equipment of physics and chemistry laboratories (U. of Concepción)	20.00	15.00	10.00	
	Reorganization of the School and Higher Institute of Education (U. of Concepción)	12	15.60	12	15.60															
	Industrial Electronics (U. of Concepción)	6	7.80	6	7.80											Equipment for the electronics laboratory (U. of Concepción)	3.00			
																Laboratory equipment and instruments (Valdivia University)	10.00		20.00	

Organization	Sub. No.	Date of completion	Total project cost			Experts						Fellows						Equipment and supplies				
			1960	1961	1962	1960		1961		1962		1960		1961		1962		1960	1961	1962		
Project title	Post title	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	No. of months	Cost	Activity	Cost	1961	1962	
Point IV (cont'd)	Adviser on industries location, U. of Chile Adviser on metallurgy, U. of Chile Adviser on structures, U. of Chile Adviser on petrology, U. of Chile Adviser on structural geology, U. of Chile Adviser on public transport in urban and rural areas (Department of Transport)	3		12		12		12		12		12		12		12		Seismological equipment			120.00	
			Cost		Cost		Cost		Cost		Cost		Cost		Cost		Cost		Cost		Cost	
			1961		1962		1961		1962		1961		1962		1961		1962		1961		1962	

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T E C H N I C A L A S S I S T A N C E

SPECIAL PROGRAMME FOR 1960 - 1961 - 1962

SUBMITTED TO THE UNITED NATIONS, ITS SPECIALIZED AGENCIES,

THE ORGANIZATION OF AMERICAN STATES AND THE UNITED STATES

OPERATIONS MISSION

PROJECT DESCRIPTION

1. DIRECTION OF UNITED NATIONS TECHNICAL ASSISTANCE OPERATIONS

The Chilean Government's policy in face of the disaster which occurred on 21 May 1960 is to undertake a large-scale reconstruction programme, designed not only to replace what has been lost, but also to achieve the goals of economic growth which the country had been contemplating before the earthquake and to provide for the financing of reconstruction costs without impairing the policy of monetary stability. This involves intensive industrial and agricultural development, the expansion of sources of power, the co-ordination of transport, administrative reorganization, physical planning and the solution of the housing problem, conservation measures and the proper use of natural and human resources, the reorganization of education and other measures necessary to national progress and the improvement of the level of living. This objective, which is a fundamental part of the task of the United Nations, can only be achieved rapidly by means of ample international technical assistance. It is for this reason that Chile's Special Programme for the years 1960-1961-1962 includes the assistance of ninety experts from nine United Nations bodies, in addition to essential laboratory equipment and material. These experts would be in addition to the experts already working in the country under the United Nations Technical Assistance Programme who are actively participating with Chilean experts in economic planning, statistical work and the execution of the Government's basic plans.

Industrial development and productivity. The Development Corporation (CORFO) is completing a general economic development programme covering the next ten years, in the preparation of which United Nations experts have co-operated in such matters as the planning of transport, industrial location and rationalization, plastics, petrochemicals, the pharmaceutical industry, etc. When this Programme reaches the operational stage three economists specializing in programming will be required, in addition to two economists specializing in manpower questions to work in co-operation with the University of Chile on the use of human resources in development programmes. Another expert will also be required to assist in studies on the development of the agricultural machinery industry. It is also proposed, with the assistance of an expert, to continue the study of chemical resources capable of providing a basis for new industries. An expert on the location of aluminium industries is also requested, because the earthquake zone has a substantial potential preserve of hydroelectric power practically on the coast, which might provide a basis for industries such as the aluminium industry, which consume large quantities of electricity. The University of Concepción, which is situated in a highly industrialized area, also requests an expert to assist local undertakings in quality control, and equipment for its newly-formed Institute of Technological Research.

Public finance. The University of Chile needs the advice of a fiscal expert to assist the various branches of the Faculty of Economics in training plans with a view to making the National Budget a basic instrument of economic development, particularly during the period of reconstruction.

Trade and marketing. CORFO needs an expert to study the establishment of modern supermarkets throughout the country, which would widen distribution, improve hygienic conditions and the presentation and quality of goods, and have a salutary effect on prices. The University of Chile would like the help of an expert in reorganizing the courses on national and international markets in its training programmes, and the Ministry of the Economy needs an adviser to determine the types of industrial production best suited for development in the country with particular reference to the industrial problems of the devastated area.

Public administration. The Directorate-General of Posts and Telegraphs needs an adviser for one year to assist in the reorganization of the postal services in the earthquake zone and in plans for a general modernization of the postal services throughout the country. The Ministry of Finance wishes to retain the services of an adviser on organization and methods throughout the year 1962 in order to continue the modernization of the civil service with a view to securing speedier operations during the reconstruction period. The University of Concepción wishes to reorganize its programme of training administrative personnel for the public service and private enterprise, a step which will certainly be helpful to activities in the earthquake zone.

Community development. CORFO is also anxious to undertake several community development programmes in the country and needs the services of a specialist in connexion with this part of its economic development plan. At the same time, two pilot community development projects are to be carried out in the southern region, one on the island of Chiloé, with the co-operation of the United Nations, FAO, UNESCO and WHO.

Housing, physical planning and building. The Housing Corporation, which is responsible for constructing housing for the hundreds of thousands of persons left homeless in the earthquake zone, is anxious to have the assistance of an expert on sites. CORFO requires a regional planner with experience in reconstruction operations to assist it in the preparation of programmes to deal with the immense shortage of housing in this area. According to early estimates, the number of dwellings destroyed is twice the average annual construction throughout Chile in recent years. A specialist in soil mechanics and an expert on building on land liable to subsidence would advise CORFO in regard to the reconstruction or strengthening of buildings in Puerto Montt, particularly the recently completed Hotel de Turismo. The University of Concepción has requested the services of a specialist in materials testing who would be attached to the Technological Research Institute for twelve months and who would assist local industries in reconstruction processes involving materials testing. The Ministry of Public Works has requested a specialist, preferably from the Netherlands, in flood control and land reclamation particularly for the region of Valdivia which at the moment is largely submerged as a result of the seaquake, the storms and the overflowing of lakes and rivers. The expert would work in the appropriate department of the Ministry concerned.

Transport and Communications. As part of a co-ordinated plan organized by the Under-Secretary for Transport in co-operation with CORFO, it is planned to extend the activities of the expert on shipping organization throughout 1962 so that, in addition to assisting the State Shipping Organization in the modernization of its coastal trade, he may also give advice to Chilean private firms for the purpose of accelerating the transport of persons and materials during the reconstruction period. In addition, for a period of six months, provision should be made for the services of an adviser on harbour installations and the conservation of equipment, working in close contact with the other experts in harbour modernization, since reconstruction involves not only the modernization but the complete overhaul of installations which have been destroyed and in some cases swallowed up by the sea. One of the obstacles which for some time has constituted a bottleneck in Chilean urban development is the lack of a technical transport organization and, for this purpose, a general adviser is required to take part in all the regional planning work which will be necessary during the coming year.

Social Services. The University of Concepción is seeking to meet the urgent need for training individuals capable of dealing with persons displaced by the earthquake and for this purpose requires the advice of an expert for the modernization of the School of Social Welfare.

2. INTERNATIONAL TELECOMMUNICATION UNION

The General Post Office Department has urgently requested the despatch of a telecommunications expert for the purpose not only of helping to restore normal services which have been largely destroyed but also to modernize the whole national system whose many inadequacies have been revealed by the earthquake. The expert should make recommendations on an appropriate national telecommunications policy and would remain in direct contact with the leading authorities in that field.

3. WORLD METEOROLOGICAL ORGANIZATION

Meteorology. The University of Chile plans to modernize its training programmes for meteorologists in the Institute of Geophysics and Seismology and draw up a meteorological research programme with a view to inaugurating a department of meteorology within the Institute.

4. INTERNATIONAL LABOUR ORGANISATION

Manpower organization. The Government of Chile is eager to develop a broad vocational training programme in order to tackle the work of reconstruction. A national committee has been set up for this purpose and the co-operation of many authorities and Government departments has been obtained to carry forward this plan which will be embodied in a project to be submitted to the United Nations

Special Fund at the end of this year. The progress made in 1959 and 1960 in training programmes for specialists in the construction and clothing industries run by ILO instructors under the United Nations Expanded Programme of Technical Assistance have given outstandingly satisfactory results. It has therefore been planned, in the light of the earthquake, to extend this experiment immediately by concentrating all the resources of the ILO on the organization of new courses in Concepción and Valdivia (and probably one in Puerto Montt). For this purpose, additional experts and instructors will be required over and above those already assigned in the Technical Assistance Programme for 1961/62. The following fields will have to be covered: bricklaying, carpentry, plumbing, plastering, electricity, engineering and electrical oxy-acetylene welding. The costs of these courses will be met by CORFO, CORVI (Chilean Housing Corporation), the Chilean Chamber of Construction, the Department of Labour, the State Technical University, the University of Concepción and other bodies, as well as by the industries in the areas in which the courses are held. The instructors are already on the spot and this plan has been one of the most practical which the United Nations Technical Assistance Organization has been able to put into effect immediately to deal with the effects of the disaster.

Furthermore, the University of Concepción and the Technical University of "Federico Santa María" (UTFSM) have requested an adviser for eighteen months to help them reorganize their plans and programmes for the training of industrial engineers whose services are urgently needed, particularly during the reconstruction period. CORFO has also asked for two advisers to carry out important manpower studies under ECLA resolution 149-8 adopted at the Panama Conference, in which the ILO, UNESCO, OAS and ICFM were to participate. Finally, CORFO has urgently requested an expert in manpower statistics to help the Chilean authorities for a short period in evaluating manpower needs and the changes in this field, resulting from the earthquake, reconstruction requirements and the displacement of persons in the areas affected. However, if any of these projects could be tackled in 1960 with ILO funds in hand or could be transferred to other international organizations, funds should be concentrated on the extension of the manpower project alone which should also be carried forward to 1963 and 1964 and include the possibility of executing the Special Fund project. If it is possible, the equipment allocation for the three centres should also be increased by some \$90,000 when the programme is finally revised.

5. FOOD AND AGRICULTURE ORGANIZATION

The effects of the disaster on Chilean agriculture can be summarized under the following headings:

Damage - The major damage affecting agriculture and fisheries has concerned: Rural buildings. The earthquakes destroyed countless rural buildings: houses, sheds, barns and silos with considerable losses of machinery, seeds, fertilizers and agricultural commodities under storage. Agricultural industries, particularly the dairy industry, suffered similar damage.

Fisheries. It is estimated that about 1,000 fishing vessels were lost between Concepción and the island of Chiloé as a result of the seaquake. The equipment of some 1,600 fishermen left on the beaches suffered even greater damage, not to mention the heavy loss of life.

Reconstruction. One of the conclusions to be drawn from the effects of the recent earthquakes is the soundness of wooden buildings. For this reason, the use of timber should be intensified in the reconstruction of houses and sheds, storehouses, stables and other rural buildings. With its 250,000 hectares of timber plantations and its 6 million hectares of natural forest in the southern region, Chile fortunately has the necessary raw material at its disposal. However, in view of the enormous and pressing needs, it must have an assured production which is available when required and also an efficient and well-organized industry. To achieve these aims, the Government of Chile requires technical assistance in the various branches of timber production and utilization.

Fisheries

Modernization of fishing equipment. Chacao, on the island of Chiloé, provides an excellent site for a shipyard for fishing boats. Further north, in Constitución, there are already six small shipyards. The construction of fishing craft of the type traditional in Chiloé and the southern coastal region must be started at once, with the co-operation of the fishermen themselves. At the same time, plans will be made for building more advanced vessels production of which might be started within a few months. They will have motors and modern equipment. For this purpose, an expert in fishing vessels and equipment is required for fifteen months, beginning as soon as possible (1 October 1960).

Fishing co-operatives. The formation of fishing co-operatives, already successfully started on a small scale in 1959, would do much to rehabilitate the fishing industry and improve the training of fishermen. An expert on fishing co-operatives is required for twenty-seven months, beginning on 1 October 1960.

Fish marketing. The grouping of fishermen should result in the improved marketing of fishery products: collective sales by auction, storage, better packing etc. An expert in fish marketing for eighteen months beginning October 1960.

Fishing equipment. Fishing equipment (nets, diving equipment etc.) estimated at \$60,000 is needed, firstly, in the fishing areas where losses were total and, secondly, for the purposes of demonstration and training.

River fishing. An expert is required to co-operate in efforts to increase the fish population of the southern rivers and lakes with a view to providing an improved protein diet for the local population. At the same time, the fishing stations of the area will be repaired.

Economic analysis

Economics of irrigation. There are 300,000 hectares of irrigated land in the devastated area. Nearly all the irrigation systems must be repaired and often rebuilt. An assessment of the best techniques and their economic value, which is already envisaged for the country as a whole, is particularly urgent in the disaster area. For this purpose, an irrigation economist is required for six months in 1961.

Agricultural statistics. A comparative agricultural census would be particularly valuable in the earthquake zone. An agricultural sample survey is planned for the end of 1960, followed by census operations in 1961. For this purpose, a statistician with experience of agricultural sample surveys is required for three months in 1960, and a statistician with experience of agricultural censuses for four months in 1961 and four months in 1962.

Plant production and agricultural defence

Planning and organization of sugar-beet research in the southern region. With the encouragement of CORFO, sugar-beet growing has expanded in the south in recent years. The sugar-beet mills suffered little damage. It is planned to improve the cultivation of sugar-beet by increasing the sugar yield and the area planted. This will do much to rehabilitate southern agriculture and stock-farming. An expert in sugar-beet cultivation, twelve months in 1961.

Hard fibres. There are in the region various plants yielding hard fibres which have hitherto been of little economic value. More plantations are necessary for the purposes of soil conservation in this mountainous area. The object is to introduce species already known in other countries with a view to providing employment for the rural population in their cultivation and in the processing of the fibres on an industrial and/or artisanal basis. An expert in hard fibres, for six months in 1961.

Storage of grains and plants. There have been considerable losses of agricultural commodities in storage: grain warehouses (Puerto Montt), potatoes in Chiloé etc. As part of the reconstruction programme, the silos, sheds and warehouses must be made earthquake-proof as well as improved for purely storage purposes. An expert in grains and plant storage, for twelve months in 1961.

Reconstruction of dairy plant. Of the twenty-five dairy factories in the area, only three remain undamaged (see attached table). Three have been completely destroyed, thirteen have suffered major and six minor damage. One dairy industry expert, for thirty months from July 1960.

Nutrition.

Food technologist. The provision of a food technologist at an early date will be extremely valuable in the first phase of reconstruction in connexion with the utilization and processing of farm products by the agricultural industries. A food technologist, for six months in 1960.

Agricultural organizations and services

Agricultural buildings. The reconstruction of numerous farm buildings, stables, sheds, silos, milking-sheds, animal feeding-sheds etc., destroyed on thousands of farms may be carried out more cheaply and with better results by adopting simple and practical prototypes such as those already laid down by FAO. One expert in rural construction is required for twenty-four months from July 1960 onwards.

Rural administration. Under the control of the Ministry the devastated area requires a rural administration well adapted to the needs of agricultural rehabilitation. Changes will be necessary in the operation of farms to ensure a better economic return. One expert in rural administration, for twelve months from July 1960.

Resettlement. Existing settlements, such as that at Las Gaviotas (Lake Rupanco) where 125 people were buried by a fall of earth and mud, must be abandoned and re-established in safe areas. Wide areas on the slopes of the Cordillera which the Resettlement Fund had intended to use for colonization are now dangerous on account of the highly unstable condition of the ground. In addition, the expert will advise the Resettlement Fund on immigration questions, in consultation with the Intergovernmental Committee for European Migration (ICEM). One resettlement technician, for twelve months from October 1960.

Timber marketing. The transport, distribution and sale of timber must be organized for each forest zone with a view to supplying the timber-using industries. One timber-marketing technician, for nine months from October 1960.

Standardization and classification of timber. Apart from their economic advantages, the standardization and classification of lumber are becoming indispensable to prevent waste and to facilitate the use of lumber in the construction of prefabricated parts. One technician, for twenty-four months from July 1960.

Forestry economist. The areas of standing timber which can be worked most economically, the dimensions most in demand, the relative quantities involved and the comparative costs of logging in the different areas must be established without delay. One forestry economist, for nine months from October 1960.

Sawmills. The presence of a technician would help to prevent the wastage of timber, improve the maintenance of sawing plant, reduce costs and improve output. One sawmill technician, for fifteen months from October 1960.

Forest management. The reconstruction of Chile must not lead to the destruction of the country's forests. A forest management expert would help the Government in the

systematic organization of the development and exploitation of the forest regions. One forest management technician, for fifteen months from October 1960.

National Forestry Administration. Forest management covers both State and private forests. Even before the disaster occurred, the intention had been to set up a National Forestry Administration to manage the State forests and assist private forestry. This organization now urgently needs one technician to assist it in starting operations and one technician for six months in 1961.

Forestry legislation. A Forestry Bill has been before Congress since 1958. This bill will have to be revised and brought into line with current conditions after a few months' experience have been gained. One forestry legislation expert, for three months in 1961.

Soil conservation. The May earthquakes caused many extremely serious landslides, such as the landslides at Lake Riñihue and at Rupanco, resulting in heavy loss of life and injury to the population and heavy damage to houses, roads and farms. An efficient soil conservation campaign, which will permit substantial savings in the southern region, must be undertaken at the earliest possible date. It will include the provision of instruction to farmers and in the army and in the schools. A soil conservation expert, for six months in 1961.

Adviser in community development. Entire communities have been destroyed, particularly in the coastal area. Two pilot projects, in which UNTAO, UNESCO, WHO and an agricultural adviser will co-operate, have been prepared. An expert in community development, for eight months in 1961-62.

Volcanic soils. The many volcanoes of the Chilean Cordillera have had a great effect on the soils and agriculture of the southern region. The eruptions in May of 1960 affected extensive areas in the vicinity of the Puyehue volcano. The survey initiated in 1960 will have to be completed and brought up to date. For this purpose an expert in volcanic soils will be required for twelve months in 1961.

6. UNESCO

The national disaster has created such enormous human as well as economic needs that educators, in particular, the heads of the universities and leading officials of the Ministry of Education, have agreed that the whole educational system must be reviewed in order to integrate it fully with national life and international trends in education. In accordance with this concept, the Chilean universities consider that it is necessary to press forward with the development of scientific institutes and to promote scientific research for practical purposes related to the country's resources and immediate problems. At the same time, it is necessary to revise records and methods and to develop the training of teachers to meet immediate needs, which have been accentuated by the emergency. Serious losses of equipment must be made good and provision must be made for very heavy expenditures for educational materials and equipment. It is planned to allocate \$US216,000 for these needs. The plans also provide for the assistance of fifteen UNESCO experts in various activities in the country's educational institutions.

Aid to the universities. The Geophysical and Seismological Institute of the University of Chile requires the services of a seismologist and some equipment, in order to co-operate in the modernization of the country's network of seismological stations. The object is to recommend systems of inter-station communications and to enlarge the seven existing stations with a view to increasing the effectiveness of the seismological network in accordance with the recommendations made by the expert. The volcanist would assist in the formulation of a research programme for the systematic study of Chilean volcanoes, particularly from the petrological and tectonic points of view, using appropriate methods and some field equipment, pyrometers, books, etc.

The Federico Santa María Technical University wishes to reorganize its general physics courses with the assistance of an expert, while the University of Concepción wishes to obtain the assistance of an expert in theoretical physics for similar purposes, as part of its programme for the reorganization of the university into four main schools (chemistry, physics, mathematics and biology). In view of the need for teacher training, the University of Concepción also desires to obtain an adviser to assist in reorganizing its school of education to provide the nucleus of a higher institute in this field. A UNESCO industrial electronics expert will be in the field and the University of Concepción would also like to retain his services for an additional period and to obtain laboratory material to replace some of the equipment lost in the extensive destruction resulting from the earthquakes and subsequent fires. Laboratory equipment and apparatus will also be required for the University of Valdivia but it is not yet possible to provide details of the losses as the university and town were still suffering earthquakes and floods at the time of preparation of the report. The Catholic University of Santiago and the Catholic University of Valparaíso will undoubtedly take part in a number of the projects mentioned, but owing to pressure of time, specific projects have not been included for these universities. The two universities will undoubtedly be included when the programme is adjusted before being put into effect.

Primary and secondary education. The Ministry of Education has requested two advisers in over-all educational planning and in vocational educational guidance, to lay the groundwork for a programme of educational reconstruction parallel to the physical reconstruction of the country. It has also reported the allocation of funds for the equipment of the normal and secondary school laboratories destroyed throughout the earthquake area. The State Technical University has requested a vocational education adviser to review syllabuses and laboratory and workshop equipment in the various schools within its jurisdiction. It also requests the supply of equipment for the Concepción, Valdivia and Temuco vocational schools which suffered the heaviest damage reported to date.

Mass communications. During the earthquake, the University of Concepción and the State Technical University, which have educational broadcasting stations, were able to appreciate the great importance of such services in an emergency as a means of overcoming the difficulties created by the breakdown of normal communications, maintaining morale and providing guidance to the public during the emergency and

reconstruction period. In order to eliminate the principal deficiencies in the broadcasting services which came to light and to develop to the full their cultural and public-service possibilities, the assistance is requested of an expert in audio-visual education, preferably in the radio field, together with equipment, so that this new medium of general, and particularly adult, education can be further developed.

Rural education. An expert is required to co-operate in community development projects with TAO, FAO and UNESCO advisers in two towns to be selected in the southern region. In some cases towns in the southern region were totally destroyed and no longer exist on their original sites, but tens of thousands of their inhabitants cling to the hope of establishing a new life and rebuilding their former communities. In order to do so, they require assistance of all kinds. Some legislators have suggested the Queilen district in the island of Chiloé where almost all the people have lost all their possessions, houses, farms, roads, etc. The authorities consider that this would be a new approach for technical assistance work - the concentration of the activities of several international agencies in a place with manifold problems, including difficulty of access - which might serve as a model for the reconstruction programme generally.

Scientific research. The University of Chile wishes to retain during 1961 the services of the adviser in scientific research methodology who was assigned for 1960, in order to standardize the work of its laboratories and institutes and develop new methods appropriate to the reorganization undertaken during the reconstruction period. The Federico Santa María Technical University and the University of Chile have jointly recommended that an expert in solar furnaces and solar energy be secured to promote research in the use of this new form of energy and integrate it in industrial development planning. The Ministry of Education wishes to obtain the services of an expert to assist in the over-all development of scientific education at the primary and secondary levels as part of its general improvement programme, while the University of Chile, which has a regional college at Temuco, requests an adviser for six months to reorganize scientific education at the intermediate level and also supplies of appropriate equipment and apparatus.

7. INTERNATIONAL CIVIL AVIATION ORGANIZATION

The Department of Transport of the Ministry of the Economy has suggested that a number of advisers should be made available to the Civil Aviation Board set up under Decree with force of law No. 241 to assist in dealing with problems arising out of the disaster; these problems have shown the need for a radical reorganization of air services, which, for geographical reasons, are exceptionally important in Chile. For instance, an expert is needed on airfields, which are under the control of the Board, because the disaster has indicated the need for good airfields while emergency programmes are being carried out. In constructing the airfields, it is planned to use tarmac, which is understood to be 50 per cent cheaper than concrete. It is hoped to obtain an expert who will also be able to assist in planning ancillary buildings and installations.

The expert requested on air navigation would co-operate in preparing a sound and co-ordinated programme of civil aviation requirements, in determining the personnel required and their training programmes; he would also co-operate in laying down aeronautical standards. The expert in legislation would be a key individual in the organization of the new Civil Aviation Board, his function being to assist in drawing up, as quickly as possible, air traffic rules and regulations, control procedures etc. An expert on aviation economics is also needed to advise the National Air Line (LAN) and the Civil Aviation Board on rate-fixing.

8. WORLD HEALTH ORGANIZATION

The National Health Service has indicated that it would like to have an adviser on the public health aspects of town planning who would co-operate in the planning of new towns and in the reconstruction of existing towns by making recommendations on a number of matters which require advance planning and on which decisions must be taken in relation to other architectural and engineering problems, i.e. on such problems as the organization of water supplies and the installation of filtering systems, sewers, the siting of green areas, ventilation, lighting, the siting of hospitals and polyclinics, etc. The Chilean Development Corporation (CORFO) also requires an adviser on public health matters to take part in its pilot community development project together with TAO, FAO and UNESCO; a small appropriation would be made for health equipment. The National Health Service wishes to improve methods of collecting data and information on local action with respect to the organization of emergency health services and on vital statistics in the earthquake area from the standpoint of public health, nutrition, working conditions, etc. This also calls for the modernization of equipment and the organization of statistical programmes and services in the area of the earthquake.

9. INTERNATIONAL MONETARY FUND

Finance, currency stabilization and foreign exchange. The services of the IMF expert are desired for a further six months in 1960.
