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CHILE

WATER SUPPLY AND SEWERAGE

SECTOR SURVEY

Volume Two  
of  
Two Volumes

APPENDICES

Public Utilities Projects Division - IBRD/IDA

Pre-Investment Planning Unit, Division of Environmental Health - WHO

May 1975

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VOLUME TWO

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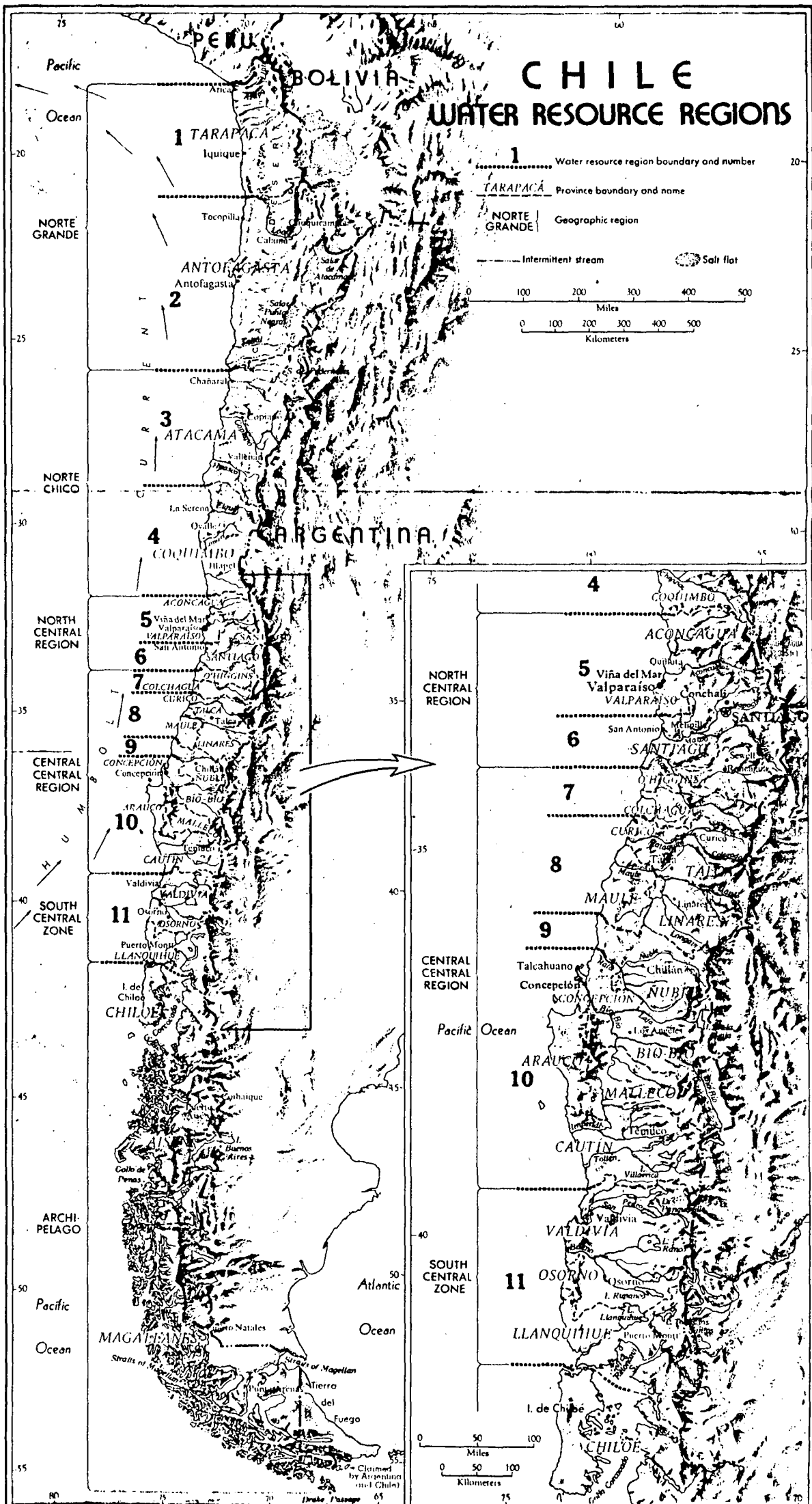
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Table 1 Appendix A

Infective and Parasitic Diseases 1972

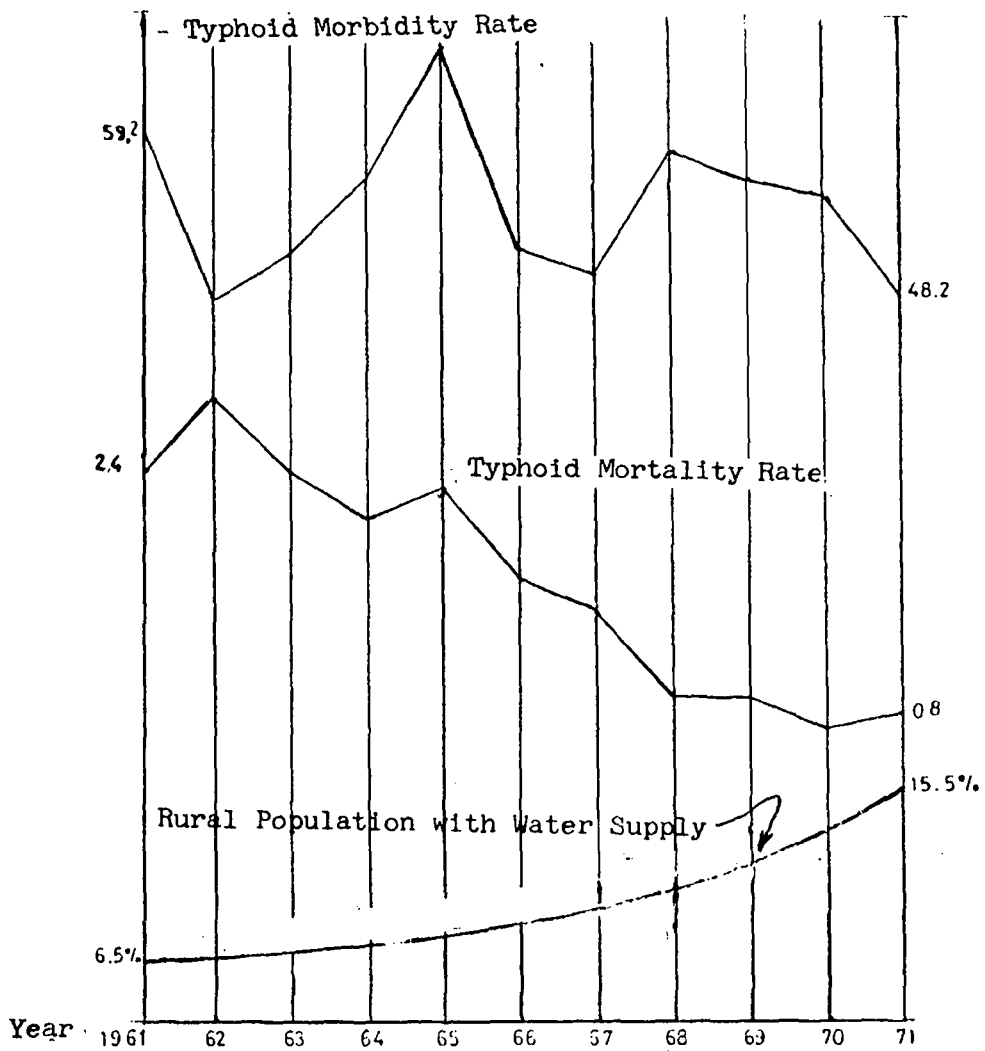
| International A List | Disease                                  | No. of Deaths | % of Total |
|----------------------|--|---------------|------------|
| A1-A5                | Enteric Infections <sup>1/</sup>         | 3735          | 45.4       |
| A6-A10               | Tuberculosis                             | 2396          | 29.1       |
| A12                  | Authrax                                  | 2             | N11        |
| A15                  | Diphtheria                               | 87            | 1.0        |
| A16                  | Whooping Cough                           | 109           | 1.3        |
| A17                  | Scarlet Fever & Strep Throat             | 10            | 0.1        |
| A18                  | Erysipelas                               | 8             | 0.1        |
| A19                  | Meningococcal Infection                  | 10            | 0.1        |
| A20                  | Tetanus                                  | 30            | 0.4        |
| A21                  | Other Bacterial Diseases                 | 1313          | 16.0       |
| A22-A23              | Poliomyelitis                            | 4             | N11        |
| A25                  | Measles                                  | 159           | 2.0        |
| A27                  | Encephalitis, Viral                      | 31            | 0.4        |
| A28                  | Infectious Hepatitis                     | 77            | 0.9        |
| A29                  | Other Viral Diseases                     | 93            | 1.1        |
| A32                  | Trypanosomiasis                          | 21            | 0.3        |
| A34-A38              | Syphilis & Gonococcal Infection          | 42            | 0.5        |
| A40                  | Hydatidosis                              | 64            | 0.8        |
| A43                  | Other Helminthiases                      | 25            | 0.3        |
| A44                  | All other Infective & Parasitic Diseases | 16            | 0.2        |
| <b>Total Deaths</b>  | <b>A1 - A44</b>                          | <b>8232</b>   | <b>100</b> |

Source: World Health Statistics Annual 1972,  
Vol.I, Vital Statistics and Causes of Death,  
WHO, Geneva, 1975

<sup>1/</sup> See Table 2 and footnote for specific diseases and numbers of deaths

CHILE  
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Table 2 Appendix A

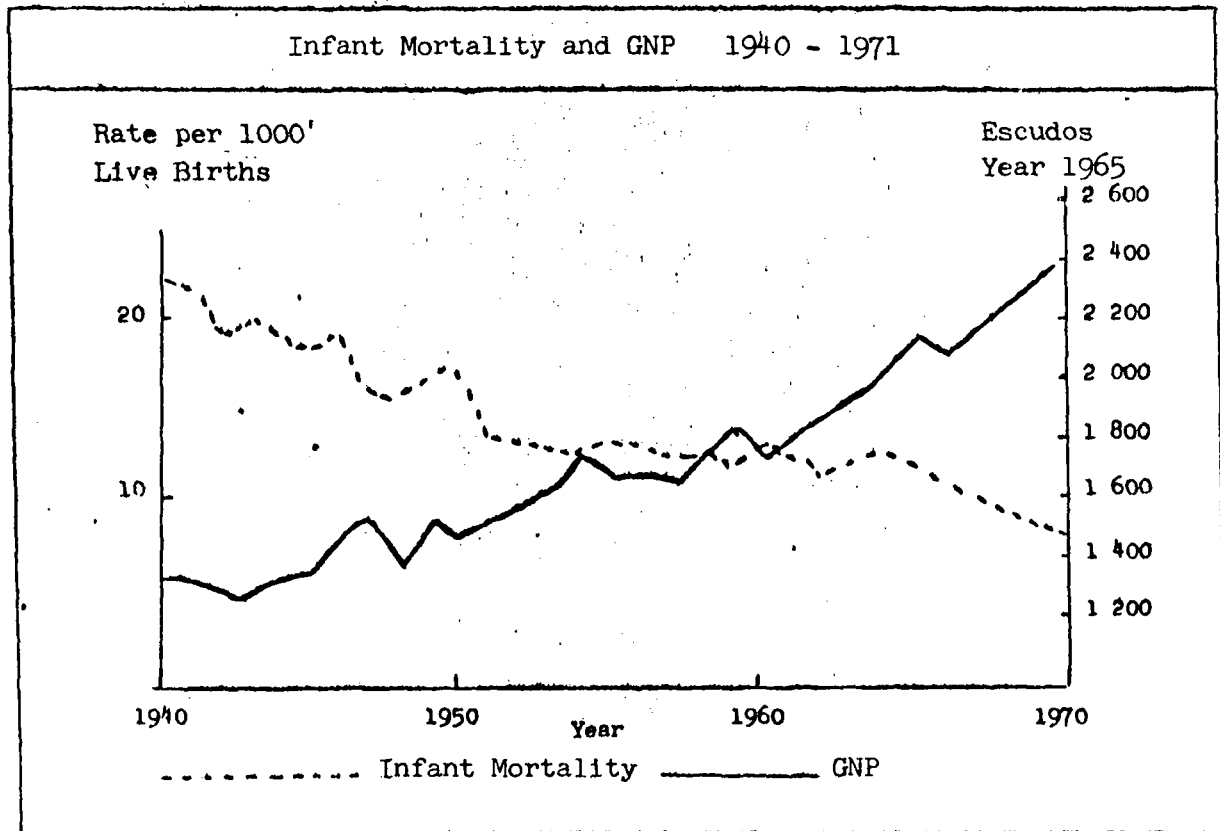


Mortality And Morbidity Of Typhoid Fever In  
 Relation To Rural Population Served By Public  
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1961 - 1971

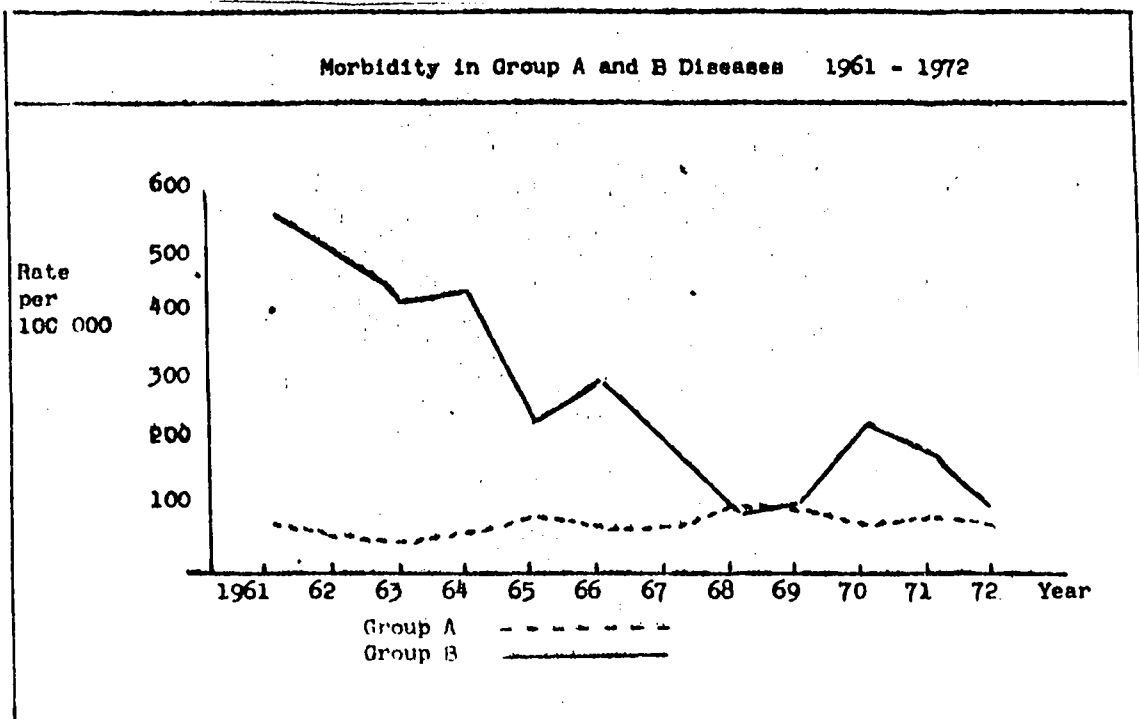
CHILE  
WATER SUPPLY AND SEWERAGE  
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Table 3 Appendix A



CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 4 Appendix A



Group A: Typhoid and Paratyphoid, Dysentery, Amebiasis, Infectious Hepatitis, Brucellosis, Trichinosis, Animal Rabies and Tetanus

Group B: Measles, Diphtheria, Poliomyelitis, etc.



CHILE  
WATER SUPPLY AND SEWERAGE  
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Table 5 Appendix B

Water Resource Regions

| <u>REGION</u>     | <u>PROVINCE</u>                   |
|-------------------|-----------------------------------|
| 1. NORTE GRANDE   | 1.1 Tarapacá                      |
|                   | 1.2 Antofagasta                   |
| 2. NORTE CHICO    | 2.1 Atacama                       |
|                   | 2.2 Coquimbo                      |
| 3. ZONA CENTRAL   | 3.1 Valparaíso y<br>Aconcagua     |
|                   | 3.2 Santiago                      |
|                   | 3.3 O'Higgins, Colchagua y Curicó |
|                   | 3.4 Talca, Linares, Maule y Nuble |
| 4. ZONA SUR CHICO | 4.1 Bío Bío, Concepción y Arauco  |
|                   | 4.2 Malleco, Cautin y Valdivia    |
|                   | 4.3 Osorno y Llanquihue           |
| 5. REGION AUSTRAL | 5.1 Chiloé Aysén y Magallanes     |

## Water Availability By Regions

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WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 6 Appendix B

| Region            | Province    | Area<br>km <sup>2</sup> | Water Available<br>10 <sup>6</sup> x m <sup>3</sup> /yr | Water Available per km <sup>2</sup><br>m <sup>3</sup> /yr |
|-------------------|-------------|-------------------------|---|---|
| NORTE<br>GRANDE   | Tarapaca    | 58 072.7                | 158   | 2 721   |
|                   | Antofagasta | 125 306.3               | 122   | 974   |
|                   |             | 183 379.0               | 280   | 1 527   |
| NORTE<br>CHICO    | Atacama     | 78 267.5                | 375   | 4 791   |
|                   | Coquimbo    | 39 647.0                | 1090  | 27 493  |
|                   |             | 117 914.5               | 1 465   | 12 425  |
| ZONA<br>CENTRAL   | Valparaiso  | 5 118.0                 |   |   |
|                   | Aconcagua   | 9 873.5                 |   |   |
|                   |             | 14 991.5                | 1 586   | 107 790   |
|                   | Santiago    | 17 685.8                | 3 726   | 210 675   |
|                   | O'Higgins   | 7 105.5                 |   |   |
|                   | Colchagua   | 8 326.8                 |   |   |
|                   |             | 15 432.3                | 4 974   | 322 317   |
|                   | Curico      | 5 266.3                 |   |   |
|                   | Talca       | 10 141.1                |   |   |
|                   | Linares     | 9 413.8                 |   |   |
| Maule             | 5 696.9     |                         |   |   |
|                   | 30 518.1    | 16 238                  | 532 080   |   |
| SUR<br>CHICO      | Nuble       | 13 951.3                |   |   |
|                   | Concepcion  | 5 681.1                 |   |   |
|                   | Arauco      | 5 240.1                 |   |   |
|                   | Bio Bio     | 11 134.7                |   |   |
|                   | Malleco     | 14 095.1                |   |   |
|                   |             | 50 102.3                | 27 000  | 538 940   |
|                   | Cautin      | 18 376.7                |   |   |
|                   | Valdivia    | 18 472.5                |   |   |
|                   |             | 36 849.2                | 40 310  | 1 093 950   |
|                   | Osorno      | 9 236.3                 | 18 239  | 1 974 775   |
| Llanquihue        | 18 205.1    | N.A.                    | N.A.  |   |
| REGION<br>AUSTRAL | Chiloe      | 26 694.8                |   |   |
|                   | Aysen       | 103 583.9               |   |   |
|                   | Magallanes  | 132 033.5               | N.A.  | N.A.  |

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 7 Appendix B

| Region              | Province    | Water Usage By Sector $10^6 \times m^3/yr$ |          |              |            |                             |         |           |                     |
|---------------------|-------------|--|----------|--------------|------------|-----------------------------|---------|-----------|---------------------|
|                     |             | Water Supply                               | Industry | Mining       | Irrigation | Hydroelectric <sup>1/</sup> | Thermal | Total     | Total <sup>2/</sup> |
| NORTE GRANDE        | Tarapaca    | 16.74                                      | 9.36     | 1.13         | 32.81      |                             | 0.68    | 60.72     | 60.04               |
|                     | Antofagasta | 19.88                                      | 1.86     | 33.26        | 28.39      |                             | 232.942 | 316.33    | 83.39               |
| NORTE CHICO         | Atacama     | 8.62                                       | 0.14     | 35.12        | 137.70     |                             | 65.13   | 246.71    | 187.58              |
|                     | Coquimbo    | 16.81                                      | 0.83     | 3.44         | 623.70     |                             | 3.54    | 648.32    | 644.78              |
| ZONA CENTRAL        | Valparaiso  | 71.41                                      | 36.66    | 3.82         | 503.49     |                             | 227.74  | 855.65    | 627.91              |
|                     | Aconcagua   | 10.77                                      | 1.58     | 0.18         |            |                             | -       |           |                     |
|                     | Santiago    | 427.80                                     | 173.19   | 5.44         | 2 095.86   |                             | 79.22   | 2 781.53  | 2 702.31            |
|                     | O'Higgins   | 17.51                                      | 1.77     | 15.09        | 1 356.75   |                             | 9.37    | 1 400.49  | 1 391.12            |
|                     | Colchagua   | 7.35                                       | 0.30     | -            | 727.41     |                             | -       |           | 735.06              |
|                     | Curico      | 5.21                                       | 0.24     | -            | 1 223.10   |                             | -       |           | 1 234.63            |
|                     | Talca       | 13.23                                      | 0.95     | -            | 985.83     |                             | -       |           | 1 000.01            |
|                     | Linares     | 6.60                                       | 0.90     | -            | 1 112.63   |                             | 3.68    | 1 123.81  | 1 120.13            |
|                     | Maule       | 3.05                                       | 0.06     | -            | -          |                             | -       |           | 3.11                |
|                     | Nuble       | 12.02                                      | 1.11     | -            | 601.74     |                             | 4.19    | 619.06    | 614.87              |
| SUR CHICO           | Concepcion  | 53.28                                      | 209.01   | -            | 405.49     |                             | 72.40   | 740.18    | 667.78              |
|                     | Arauco      | 3.21                                       | 0.04     | -            | 10.08      |                             | 1.24    | 14.57     | 13.33               |
|                     | Bio Bio     | 5.88                                       | 63.09    | -            | 1 086.94   |                             | 61.76   | 1 217.67  | 1 155.91            |
|                     | Malleco     | 6.01                                       | 0.12     | -            | 430.36     |                             |         |           | 436.49              |
|                     | Cautin      | 12.71                                      | 2.93     | -            | 412.01     |                             |         |           | 427.65              |
|                     | Valdivia    | 11.47                                      | 2.96     | -            | -          |                             | 1.26    | 15.69     | 14.43               |
|                     | Osorno      | 6.84                                       | 0.99     | -            | -          |                             | 0.11    | 7.94      | 7.83                |
|                     | Llanquihue  | 11.35                                      | 0.46     | -            | -          |                             | 1.64    | 13.45     | 11.81               |
| REGION AUSTRAL      | Chiloe      | 2.50                                       | 0.06     | -            | -          |                             | 0.0     |           | 2.56                |
|                     | Aysen       | 3.53                                       | 0.04     | 0.02         | -          |                             | 1.42    | 5.01      | 3.59                |
|                     | Magallanes  | 9.18                                       | 3.99     | -            | -          |                             | 10.31   | 23.48     | 13.17               |
| TOTAL <sup>3/</sup> |             | 762.96                                     | 512.64   | 97.50        | 11 780.37  |                             | 776.5   | 13 929.97 | 13 153.47           |
| TOTAL <sup>4/</sup> |             | 495  | 450      | 100<br>(158) | 15 900.00  | 24 400.00                   |         | 41 345.00 | 16 945.00           |
| TOTAL <sup>5/</sup> |             | 650  | 450      | 100          | 15 900.00  | 24 400.00                   |         | 41 500.00 | 18 000.00           |

<sup>1/</sup> Information as water used for hydroelectric by Regions was not available, except for an estimate of total usage.

<sup>3/</sup> R. Gomez (1967/70)  
<sup>4/</sup> R. Garcia (1970)  
<sup>5/</sup> MOP.PEN (1970)

<sup>2/</sup> Total usage excluding water used for hydroelectric and thermal energy.

Estimate of Water Available For Domestic Supplies From Existing Sources  
1970 - 2000

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 8 Appendix B

| Region       | Province    | Population |           |           |           |           | Total Water Available<br>(10 <sup>6</sup> x m <sup>3</sup> /year) | Total Available for Domestic Water Supply<br>(10 <sup>6</sup> x m <sup>3</sup> /year) | Water Available For Individual Use litres/cap./day |        |        |        |      |
|--------------|-------------|------------|-----------|-----------|-----------|-----------|---|---|--|--------|--------|--------|------|
|              |             | 1970       | 1973      | 1980      | 1990      | 2000      |   |   | 1970   | 1973   | 1980   | 1990   | 2000 |
| NORTE GRANDE | Tarapacá    | 176 180    | 187 425   | 207 645   | 254 385   | 321 800   |   | 44.05   | 685  | 645    | 580    | 475    | 375  |
|              | Antofagasta | 251 655    | 263 120   | 296 600   | 363 365   | 459 655   |   | 29.08   | 315  | 300    | 270    | 220    | 175  |
|              |             | 322 835    | 450 545   | 504 245   | 617 750   | 781 455   | 280   | 71.48   | 605  | 435    | 390    | 315    | 250  |
| NORTE CHICO  | Atacama     | 152 685    | 161 690   | 179 955   | 220 460   | 278 880   |   | 17.80   | 320  | 300    | 270    | 220    | 175  |
|              | Coquimbo    | 340 820    | 355 285   | 401 690   | 492 110   | 622 520   |   | 28.42   | 230  | 220    | 195    | 160    | 125  |
|              |             | 493 505    | 516 975   | 581 645   | 712 570   | 901 400   | 1 465   | 45.08   | 250  | 240    | 210    | 175    | 135  |
| ZONA CENTRAL | Valparaíso  | 747 360    | 795 285   | 880 840   | 1 079 115 | 1 365 080 |   |   |  |        |        |        |      |
|              |             | Aconcagua  | 162 185   | 169 070   | 191 150   | 234 175   | 296 230   |   |  |        |        |        |      |
|              |             |            | 909 545   | 964 355   | 1 079 990 | 1 313 290 | 1 661 310   | 1 586   | 207.58   | 625    | 590    | 525    | 435  |
|              | Santiago    | 3 235 240  | 3 718 440 | 4 069 995 | 5 064 295 | 6 274 155 | 3 726   | 589.85  | 500  | 435    | 400    | 320    | 255  |
|              | O'Higgins   | 310 940    | 323 185   | 366 475   | 448 970   | 567 950   |   |   |  |        |        |        |      |
|              |             | Colchagua  | 168 730   | 173 050   | 198 865   | 243 630   | 308 190   |   |  |        |        |        |      |
|              |             |            | 429 670   | 496 235   | 565 340   | 692 600   | 876 140   | 4 974   | 58.21  | 330    | 320    | 280    | 230  |
|              | Curicó      | 114 720    | 118 430   | 135 210   | 165 645   | 209 540   |   |   |  |        |        |        |      |
|              |             | Talca      | 234 330   | 242 910   | 276 180   | 338 350   | 428 010   |   |  |        |        |        |      |
|              |             | Linares    | 191 915   | 197 620   | 226 190   | 277 105   | 350 540   |   |  |        |        |        |      |
| Maule        |             | 83 245     | 85 865    | 98 110    | 120 195   | 152 045   |   |   |  |        |        |        |      |
|              | 624 210     | 644 825    | 735 690   | 901 295   | 1 140 135 | 16 238    | 135.84  | 595   | 575  | 505    | 410    | 325    |      |
| SUR CHICO    | Ñuble       | 318 190    | 328 715   | 375 020   | 459 435   | 581 185   |   |   |  |        |        |        |      |
|              |             | Concepción | 665 410   | 705 430   | 784 255   | 9 790     | 1 215 400   |   |  |        |        |        |      |
|              | Arauco      | 98 750     | 102 245   | 116 390   | 142 590   | 180 375   |   |   |  |        |        |        |      |
|              | Bío Bío     | 192 910    | 199 625   | 227 365   | 278 545   | 352 360   |   |   |  |        |        |        |      |
|              | Malleco     | 176 650    | 183 135   | 208 200   | 255 065   | 322 660   |   |   |  |        |        |        |      |
|              |             | 1 451 910  | 519 150   | 1 711 230 | 2 096 425 | 2 651 980 | 27 000  | 751.62  | 1455   | 1355   | 1200   | 980    | 775  |
| Cautín       | 420 620     | 434 800    | 495 740   | 607 330   | 768 270   |           |   |   |  |        |        |        |      |
|              | Valdivia    | 275 895    | 286 135   | 325 170   | 398 365   | 503 930   |   |   |  |        |        |        |      |
|              | 696 515     | 720 935    | 820 910   | 1 005 695 | 1 272 200 | 40 310    | 2204.90   | 8675  | 8380   | 7360   | 6000   | 4750   |      |
| Osorno       | 159 645     | 165 660    | 188 160   | 230 515   | 291 600   |           |   |   |  |        |        |        |      |
|              | Llanquihue  | 201 075    | 208 175   | 236 985   | 290 330   | 367 270   |   |   |  |        |        |        |      |
|              |             |            |           |           |           | 18 239    | 15933.00  | 2734670   | 263530   | 232020 | 189385 | 149715 |      |
|              |             |            |           |           |           | N.A.      |   |   |  |        |        |        |      |
| ZONA AUSTRAL | Chiloé      | 111 220    | 113 710   | 131 085   | 160 590   | 203 145   |   |   |  |        |        |        |      |
|              | Aysen       | 48 945     | 51 130    | 57 685    | 70 670    | 89 400    |   |   |  |        |        |        |      |
|              | Magallanes  | 91 625     | 97 150    | 107 990   | 132 300   | 167 360   |   |   |  |        |        |        |      |
|              |             |            |           |           |           | N.A.      |   |   |  |        |        |        |      |
|              |             |            |           |           |           | N.A.      |   |   |  |        |        |        |      |

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 9 Appendix C

Historical Background of Sector Agencies

The Chilean water supply and sewerage sector is not regulated by any single Government Law or Decree, but has evolved over many years through a series of legislative acts to its present state. Urban water supply and sewerage services were initiated in 1861 when agreement was reached with the Municipality of Santiago to provide such services for its inhabitants. The Empresa de Agua Potable de Santiago (EAPS) was formed at a later date. In 1906, the Government took action for the promotion and construction of sanitary works throughout the rest of the country under the direction of the Hydraulic Division of the General Department of Public Works. In 1931, Law DFL 235 established the General Department of Water Supply and Sewerage within the Ministry of the Interior responsible for the provision of nationwide services, excepting Santiago, administered by Provincial Administrators under the supervision of the General Department. The design and construction of water supply and sewerage systems, however, continued under the responsibility of the Hydraulic Division of the General Department of Public Works.

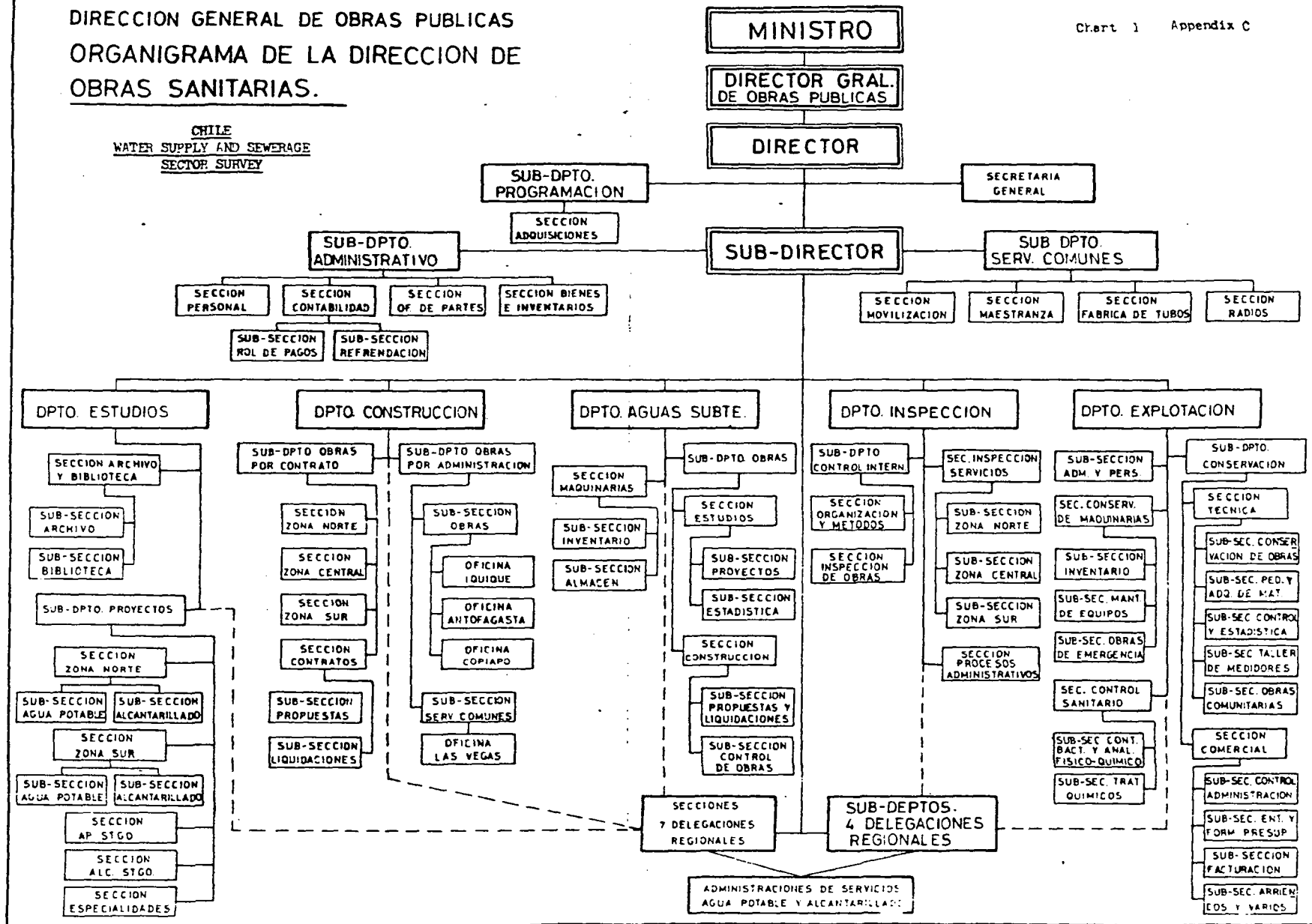
In 1953 by Law DFL 150, the General Department of Water Supply and Sewerage was joined with the Hydraulic Division to form the present Division of Sanitary Works or Direccion de Obras Sanitarias (DOS). Its organizational structure and responsibilities have remained basically unchanged to the present day. The General Department of Public Works was reorganized into a Ministry in 1964 with DOS continuing to be a dependency. In 1967, the Division of Sanitary Services (DSS) was created within the Ministry of Housing, which since then continues to function without change.

While there are a number of Government regulations and legislative acts dating back to 1926, rural water supplies and sanitation began to be organized and supported when Law 10383 in August 1952 created the National Health Service or Servicio Nacional de Salud (SNS) and its dependency the Environmental Hygiene Section or Seccion Higiene del Ambiente (SHA). In 1964, the Rural Sanitation Office or Oficina de Saneamiento Rural (OSR) was formed to deal specifically with rural water supplies and is part of the SNS. These Governmental agencies are in operation at the present time.

DIRECCION GENERAL DE OBRAS PUBLICAS  
 ORGANIGRAMA DE LA DIRECCION DE  
 OBRAS SANITARIAS.

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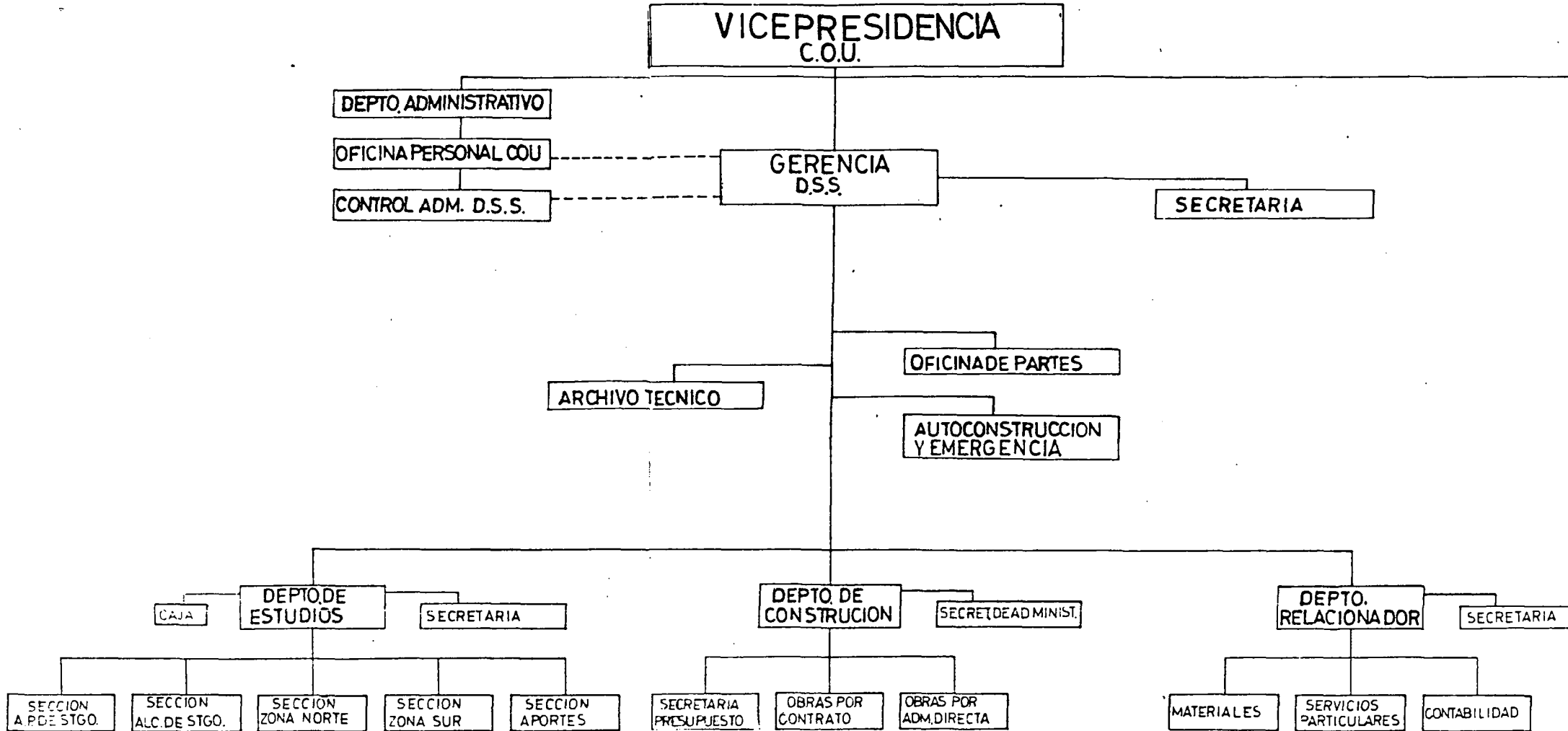
Chart 1 Appendix C



CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Chart 2 Appendix C

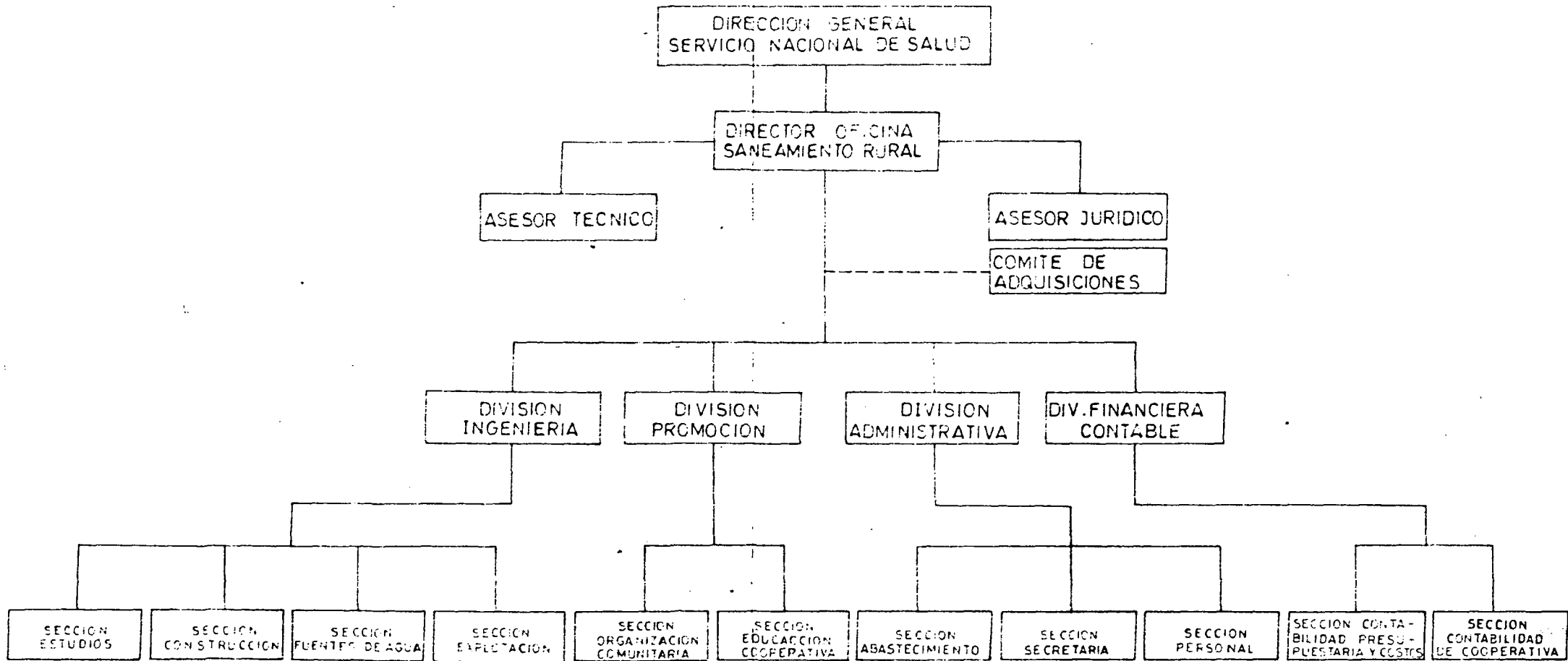
ORGANIGRAMA DE LA D.S.S.



CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Chart 4 Appendix C

ESTRUCTURA ORGANICA DE LA OFICINA DE SANEAMIENTO RURAL S.N.S  
DECRETOS Nº 11332 Y 04021

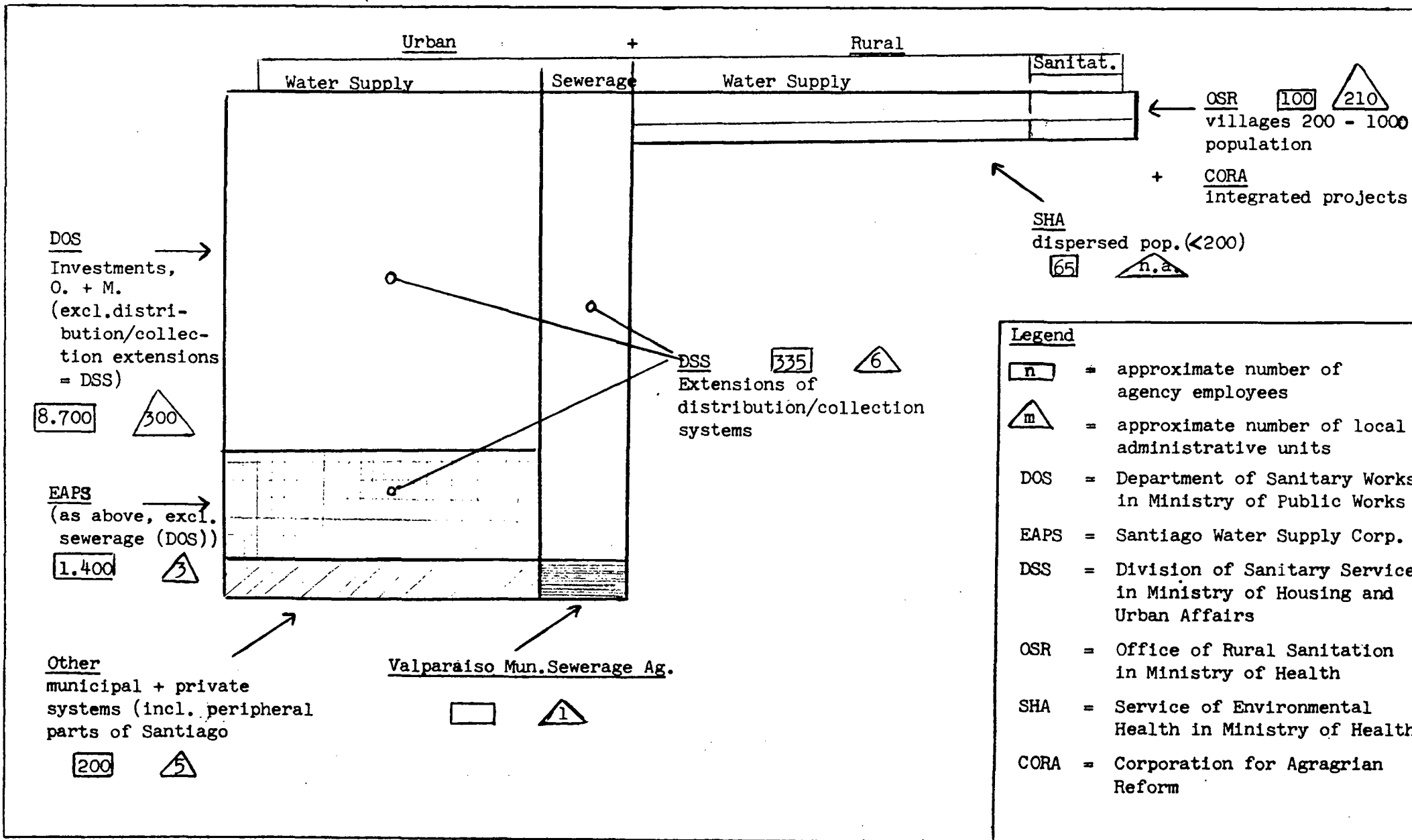




CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 10 Appendix C

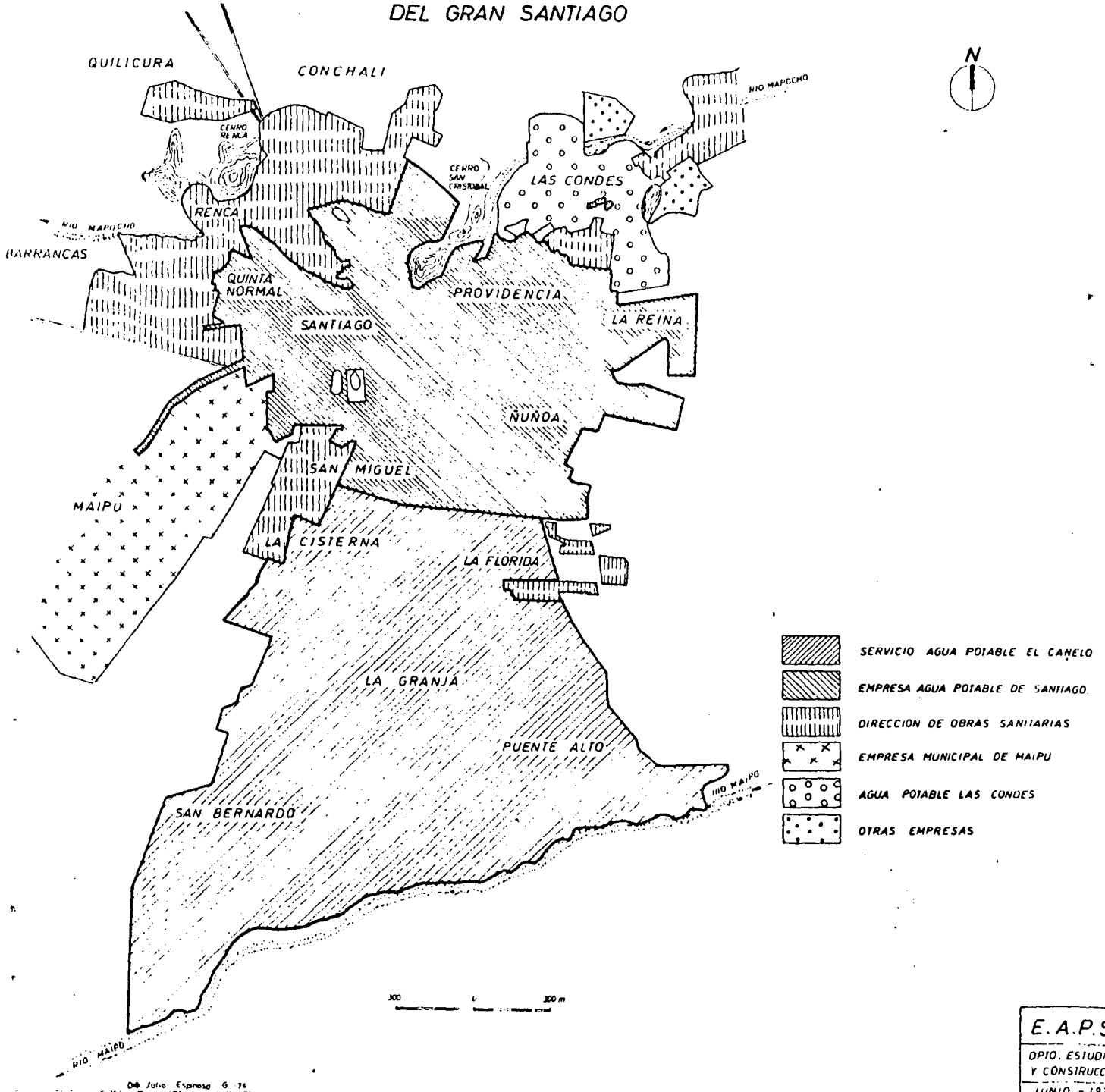
Graphical Representation of Sector Institutional Structure



CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

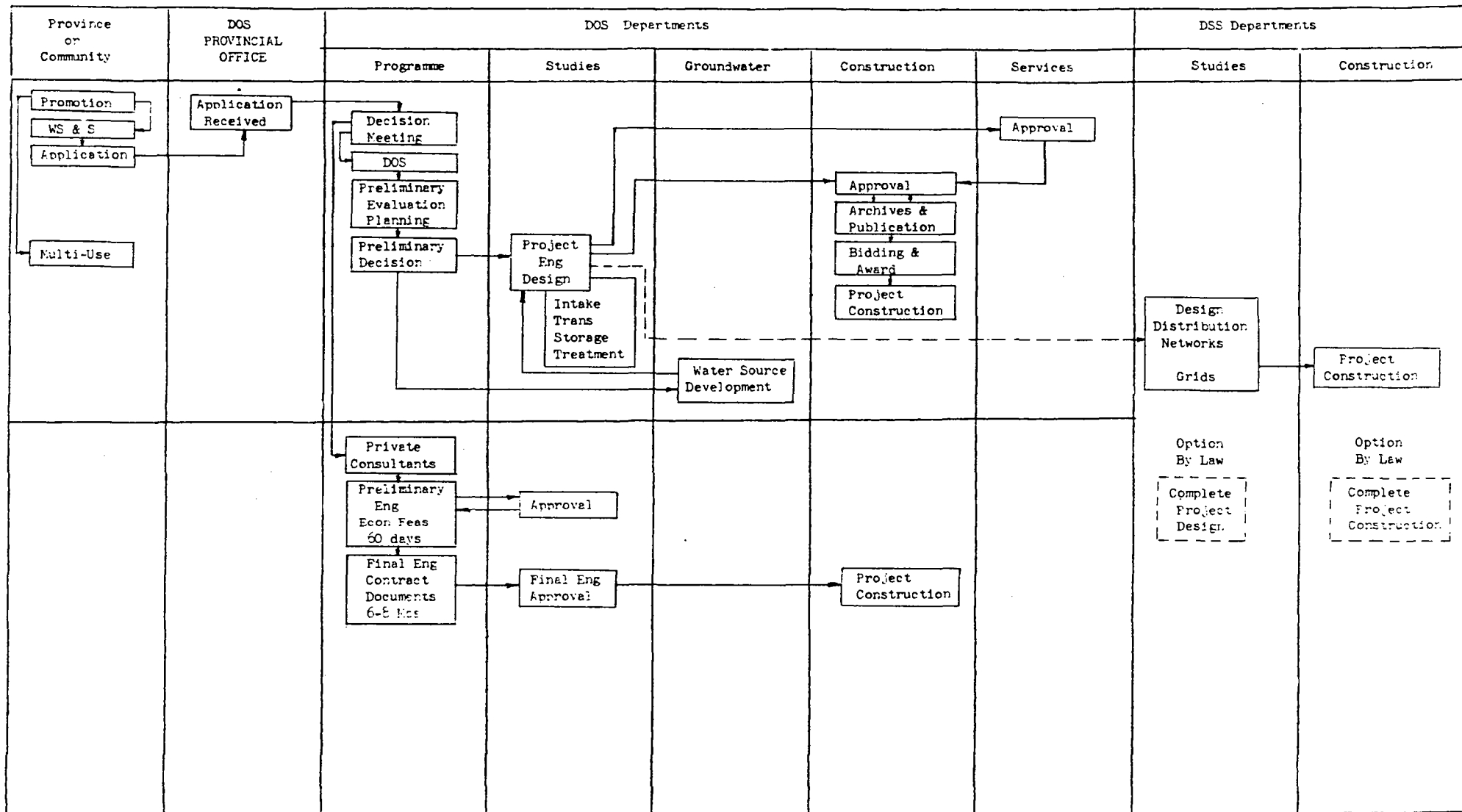
Table 11 Appendix C

**EMPRESAS Y SERVICIOS DE AGUA POTABLE  
DEL GRAN SANTIAGO**



CHILE  
WATER SUPPLY AND SEWERAGE  
SERVICE SUPERVISOR

Table 12 Appendix C



CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 13 Appendix D

Fiscal Institution Versus Public Corporation  
Flow Charts for Funding

The Government operates financially on basically two types of organizations, which can be defined principally by the difference in their fiscal policies or in their budgetary and accounting procedures. Operation can be best explained by flow diagrams for the two main sector agencies, DOS and EAPS. The accompanying chart is a graphic presentation of the flow of income and expenditure in the two organizations, one DOS operating as a fiscal institution and the other EAPS functioning as a public corporation. The chart also reveals the extreme difficulties in providing any meaningful financial analysis of public sector institutions of the fiscal type. The criss-crossing of the various flow lines reflect the confusion and uncertainty encountered when attempting to simply identify or determine amounts of major expenditure items, e.g. parts of the capital budget are earmarked for personnel expenditures, etc.

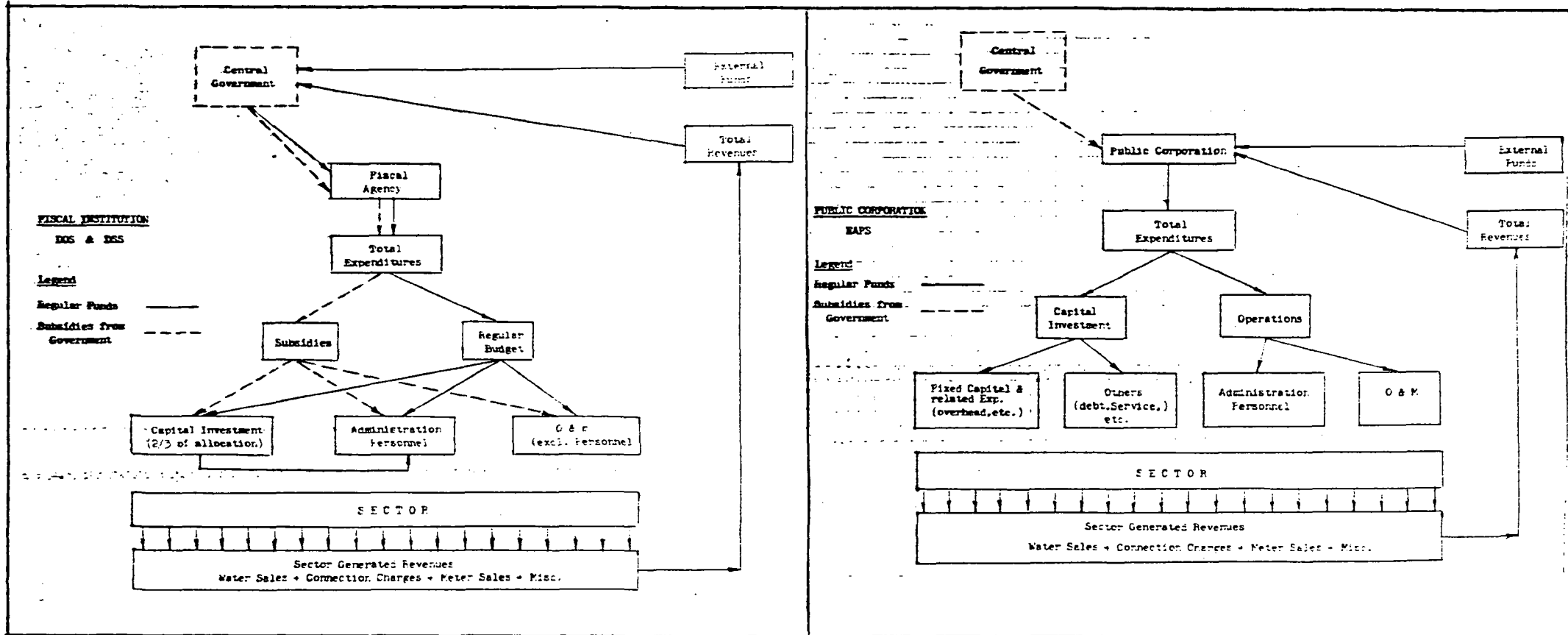
The principal disadvantage of fiscal institutions is that their structural make-up and the organization methods they typically employ do not fit the pattern of a modern service industry. For lack of administrative and financial autonomy, with rudimentary programme budgeting procedures and no basis for operational planning, there is not much room for adaptation and flexibility in response to market demand. The very idea of operating as a clients' service is absent. In addition and in the case of DOS a fact quite important in preventing it from becoming and remaining financially viable is that water revenues are not related to production and distribution costs, since revenues are mainly obtained by transfers and subsidies from the Central Government Budget.

The public corporation on the other hand such as EAPS is inclined to be more cost-conscious because expenditure has to be met from revenue collections. It also tends to be more oriented towards a tariff policy that is based on the underlying cost structure, i.e. favouring differentiation of tariffs by consumer groups and volume. The lack of complete tariff autonomy of EAPS has probably further stimulated cost-consciousness among its management, in order to insure continuity of vital service in the face of operation maintenance and renewal needs far in excess of available funds.

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 13 Appendix D

Fiscal Institution Versus Public Corporation  
 Flow charts for Funding



CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 14    Appendix D

| <u>EXPENDITURES</u>     |      | <u>Average Percentages</u>     |                       |
|-------------------------|------|--------------------------------|-----------------------|
|                         |      | <u>DOS</u>                     | <u>EAPS</u>           |
| <u>Capital</u>          |      | 64                             | 34                    |
|                         | High | 72 (1972)                      | 36 (1968)             |
|                         | Low  | 53 (1970)                      | 30 (1973)             |
| <u>O &amp; M</u>        |      | 13                             | 18                    |
|                         | High | 22 (1968)                      | 22 (1968)             |
|                         | Low  | 6 (1973)                       | 13 (1972)             |
| <u>Personnel</u>        |      | 23                             | 48                    |
|                         | High | 31 (1970)                      | 55 (1972)             |
|                         | Low  | 16 (1969)                      | 42 (1968)             |
| <br><u>INCOME</u>       |      | <br><u>Average Percentages</u> |                       |
|                         |      | <u>DOS</u>                     | <u>EAPS</u>           |
| <u>Water Sales</u>      |      | 11                             | 63                    |
|                         | High | 20 (1969)                      | 72 (1968)             |
|                         | Low  | 3 (1973)                       | 44 (1973)             |
| <u>Various Revenues</u> |      | 8                              | 20                    |
|                         | High | 19 (1969)                      | 32 (1969)             |
|                         | Low  | 2 (1973)                       | 14-15 (1972-<br>1973) |
| <u>External Finance</u> |      | 11                             | 3                     |
|                         | High | 22 (1969)                      | 3 (1970)              |
|                         | Low  | 1 (1973)                       | 1 (1972)              |
| <u>Subsidies</u>        |      | 81                             | 14                    |
|                         | High | 97 (1973)                      | 41 (1973)             |
|                         | Low  | 73 (1970)                      | 1 (1969)              |

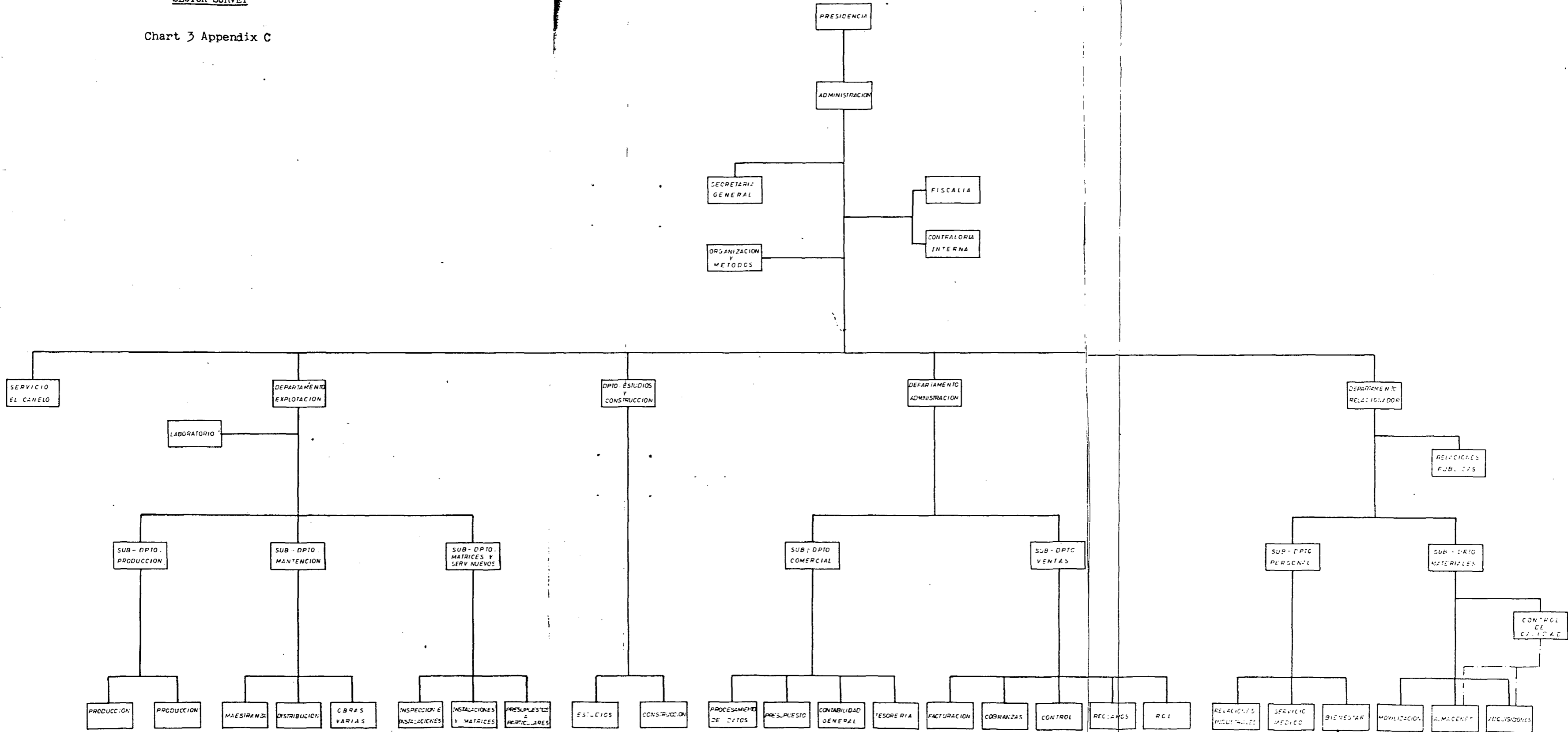
CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 15 Appendix D

| EAPS - Selected Performance Indicators 1964 - 1974 |                            |                         |                       |                            |                  |          |           |
|--|----------------------------|-------------------------|-----------------------|----------------------------|------------------|----------|-----------|
| Years  | Major Expenditures         |                         |                       | Sources of Funds           |                  |          |           |
|  | Percentage Distribution of |                         |                       | Percentage Distribution of |                  |          |           |
|  | Capital Expenditures       | Operation & Maintenance | Personnel Expenditure | Water Sales                | Various Revenues | IDB Loan | Subsidies |
| 1964   | 33                         | 20                      | 47                    | 65                         | 28               | 2        | 5         |
| 1965   | 38                         | 17                      | 45                    | 64                         | 16               | 11       | 9         |
| 1966   | 37                         | 18                      | 45                    | 76                         | 11               | 3        | 10        |
| 1967   | 37                         | 23                      | 40                    | 74                         | 19               | 3        | 4         |
| 1968   | 36                         | 22                      | 42                    | 72                         | 22               | 2        | 4         |
| 1969   | 32                         | 20                      | 48                    | 67                         | 32               | -        | 1         |
| 1970   | 35                         | 16                      | 49                    | 71                         | 19               | 3        | 7         |
| 1971   | 31                         | 15                      | 54                    | 59                         | 21               | 3        | 17        |
| 1972   | 32                         | 13                      | 55                    | 53                         | 14               | 1        | 32        |
| 1973   | 30                         | 20                      | 50                    | 44                         | 15               | -        | 41        |
| Sept. 1974   | 30                         | 18                      | 52                    | 46                         | 23               | -        | 31        |
| Average  | 34                         | 18                      | 48                    | 63                         | 20               | 3        | 14        |

Note: Derived from Table 14 , paragraph 2.62

Chart 3 Appendix C





CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 16 Appendix D

| EAPS - Current Cost Structure based on July 1974 Activity |                 |                                     |                     |              |                     |     |   |
|---|-----------------|-------------------------------------|---------------------|--------------|---------------------|-----|---|
| Process Stages  | % of total cost | Relative Shares of Major Cost Items |                     |              |                     |     | Total Cost July 1974 Escudos (millions) |
|   |                 | Personnel                           | Materials (& Elect) | Depreciation | Other <sup>2/</sup> |     |   |
| Production  | 15.3            | 18                                  | 35                  | 42           | 5                   | 100 | 97.4                                    |
| Storage   | 18.6            | 22                                  | 25                  | 39           | 14                  | 100 | 118.8                                   |
| Distribution <sup>1/</sup>                                | 16.4            | 2                                   | n.a                 | 96           | 2                   | 100 | 105.0                                   |
| Maintenance   | 21.2            | 23                                  | 32                  | 7            | 38                  | 100 | 135.0                                   |
| Studies and Design  | 2.9             | 76                                  | n.a                 | n.a          | 24                  | 100 | 18.5                                    |
| Administration  | 18.3            | 72                                  | n.a                 | 6            | 22                  | 100 | 116.9                                   |
| Sales   | 7.3             | 75                                  | n.a                 | n.a          | 25                  | 100 | 46.5                                    |
| TOTAL   | 100             | 33                                  | 21                  | 16           | 30                  | 100 | 638.1                                   |

Notes: <sup>1/</sup> Data shown under depreciation are actual replacements. The low share of personnel expenditure is explained by the principal responsibility of DSS for this part of activity.

<sup>2/</sup> Includes some overhead cost that should be allocated under personnel expenditure, probably as much as one third in some cases.

Source: EAPS, Detalles constitutivos del costo de metro cubicos (2a edicion corregida), October 1974.

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 17 Appendix E

| Latin American and Caribbean Countries <sup>1/</sup>            |                            |    |             |    |               |    |  |    |             |    |               |    |
|---|----------------------------|----|-------------|----|---------------|----|--|----|-------------|----|---------------|----|
| Populations Served with Water Supply and Sewerage <sup>2/</sup> |                            |    |             |    |               |    |  |    |             |    |               |    |
| Country   | Water Supply <sup>3/</sup> |    |             |    |               |    | Urban Sewerage <sup>4/</sup><br>Rural Waste Disposal |    |             |    |               |    |
|   | Total Urban                |    | Total Rural |    | Total Country |    | Total Urban  |    | Total Rural |    | Total Country |    |
|   | Pop.                       | %  | Pop.        | %  | Pop.          | %  | Pop.   | %  | Pop.        | %  | Pop.          | %  |
| Argentina   | 12,700                     | 64 | 654         | 14 | 13,354        | 55 | 6,200  | 31 | 4,200       | 89 | 10,400        | 42 |
| <u>Chile</u>  | 5,551                      | 75 | 365         | 16 | 5,916         | 61 | 3,231  | 44 | 315         | 14 | 3,606         | 37 |
| Perú  | 4,200                      | 60 | 500         | 7  | 4,700         | 34 | 3,800  | 54 | 1,000       | 15 | 4,800         | 35 |
| Ecuador   | 1,810                      | 74 | 244         | 6  | 2,054         | 33 | 1,383  | 57 | NA          | -  | 1,383         | 22 |
| Colombia  | 11,493                     | 88 | 2,680       | 31 | 14,173        | 65 | 9,817  | 75 | 3,060       | 35 | 12,877        | 59 |
| Brazil  | 41,300                     | 77 | 12,000      | 30 | 53,300        | 57 | 15,600   | 29 | 10,384      | 26 | 25,984        | 28 |
| Uruguay   | 2,163                      | 95 | 60          | 10 | 2,223         | 77 | 2,135  | 93 | 66          | 11 | 2,201         | 76 |
| Costa Rica  | 705                        | 93 | 780         | 71 | 1,485         | 80 | 240  | 32 | 780         | 72 | 1,020         | 55 |
| El Salvador   | 1,220                      | 88 | 820         | 39 | 2,040         | 57 | 550  | 35 | 270         | 13 | 820           | 23 |
| Guatemala   | 1,583                      | 98 | 425         | 12 | 2,008         | 39 | 808  | 50 | 515         | 14 | 1,323         | 26 |
| Jamaica   | 499                        | 65 | 647         | 52 | 1,146         | 57 | 94   | 12 | NA          | -  | NA            | -  |
| Mexico  | 19,775                     | 69 | 4,180       | 20 | 23,955        | 49 | 11,460   | 40 | 605         | 3  | 12,065        | 25 |
| Weighted Average  | 75                         |    | 29          |    | 67            |    | 46   |    | 36          |    | 43            |    |

<sup>1/</sup> World Health Statistics Report, WHO/Geneva, Vol. 26, No. 11, 1973.  
Except Chile, Costa Rica, El Salvador and Mexico are from WHO/IBRD Sector Missions.

<sup>2/</sup> All population are shown in 1000's by year; Chile in 1973.

<sup>3/</sup> Water supply coverage includes service by house connexions and public standpipe or easy access.

<sup>4/</sup> Urban sewerage service is house connected public sewerage and individual systems where known; rural waste disposal service is individual systems, i.e. septic tank, sanitary latrines, etc.

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 18 Appendix E

| Province                                  | Population | URBAN WATER SUPPLY 1973 |                  |  |                                    |                               |                                     |                                       |                     |                  | Urban sewerage <sup>1/</sup> |                  |                  |
|---|------------|-------------------------|------------------|--|------------------------------------|-------------------------------|-------------------------------------|---------------------------------------|---------------------|------------------|------------------------------|------------------|------------------|
|   |            | Population Served       | % of Pop. Served | Water Source Available m <sup>3</sup> /d | Water Production m <sup>3</sup> /d | Production per capita l/cap/d | Water Consumption m <sup>3</sup> /d | Consumption per capita Served l/cap/d | UFL <sup>2/</sup> % | Number of Conne. | Population Served            | % of Pop. Served | Number of Conne. |
| Tarapacá                                  | 172 065    | 169 135                 | 98.3             | 77 500                                   | 72 705                             | 425                           | 63 259                              | 375                                   | 13                  | 36 410           | 78 870                       | 45.8             | 17 430           |
| Antofagasta                               | 254 465    | 173 560                 | 68.2             | 104 460                                  | 71 035                             | 410                           | 65 002                              | 375                                   | 9                   | 38 160           | 130 505                      | 51.3             | 18 030           |
| Atacama                                   | 137 645    | 88 180                  | 64.1             | 41 040                                   | 41 040                             | 465                           | 26 220                              | 297                                   | 36                  | 18 820           | 33 730                       | 24.3             | 6 960            |
| Coquimbo                                  | 221 100    | 172 160                 | 77.9             | 76 635                                   | 58 245                             | 340                           | 47 449                              | 275                                   | 19                  | 34 735           | 84 030                       | 38.0             | 16 535           |
| Aconcagua                                 | 105 215    | 86 065                  | 81.8             | 38 570                                   | 34 715                             | 405                           | 27 336                              | 318                                   | 21                  | 18 475           | 33 680                       | 32.0             | 7 285            |
| Valparaíso <sup>4/</sup>                  | 272 515    | 187 910                 | 68.9             | 85 970                                   | 73 935                             | 395                           | 52 517                              | 280                                   | 29                  | 43 185           | 71 340                       | 26.2             | 16 490           |
| Santiago <sup>5/</sup>                    | 242 665    | 103 305                 | 42.6             | 57 200                                   | 44 615                             | 432                           | 27 208                              | 265                                   | 34                  | 20 995           | 62 170                       | 25.6             | 17 805           |
| O'Higgins                                 | 187 260    | 150 610                 | 80.4             | 73 200                                   | 65 880                             | 438                           | 47 906                              | 318                                   | 27                  | 29 905           | 80 050                       | 42.7             | 12 510           |
| Colchagua                                 | 66 000     | 56 675                  | 85.9             | 28 825                                   | 24 500                             | 433                           | 14 550                              | 256                                   | 40                  | 10 430           | 11 255                       | 17.1             | 2 055            |
| Curicó                                    | 56 715     | 50 190                  | 88.5             | 29 255                                   | 29 255                             | 583                           | 17 687                              | 352                                   | 40                  | 9 340            | 14 535                       | 25.6             | 4 810            |
| Talca                                     | 131 180    | 114 860                 | 87.5             | 54 260                                   | 54 260                             | 473                           | 44 443                              | 387                                   | 19                  | 20 060           | 70 870                       | 54.0             | 12 260           |
| Linares                                   | 87 210     | 63 285                  | 72.6             | 28 770                                   | 24 455                             | 387                           | 16 720                              | 264                                   | 32                  | 11 845           | 23 320                       | 27.4             | 4 475            |
| Maule                                     | 40 040     | 38 570                  | 96.3             | 25 100                                   | 21 585                             | 560                           | 11 398                              | 295                                   | 47                  | 7 350            | 14 765                       | 36.9             | 3 020            |
| Biobío                                    | 151 405    | 110 550                 | 68.5             | 51 000                                   | 48 450                             | 438                           | 26 807                              | 242                                   | 45                  | 21 745           | 42 645                       | 26.4             | 4 280            |
| Concepción <sup>6/</sup>                  | 262 670    | 143 900                 | 54.8             | 43 365                                   | 33 825                             | 235                           | 28 392                              | 200                                   | 16                  | 36 890           | 57 100                       | 21.7             | 12 225           |
| Arauco                                    | 53 395     | 25 875                  | 48.5             | 9 350                                    | 7 480                              | 290                           | 6 323                               | 244                                   | 16                  | 4 710            | 3 040                        | 5.7              | 550              |
| Efo - Bío                                 | 102 690    | 66 815                  | 65.1             | 28 080                                   | 26 675                             | 400                           | 15 039                              | 225                                   | 43                  | 13 025           | 22 175                       | 21.6             | 4 240            |
| Malleco                                   | 99 130     | 71 890                  | 72.5             | 33 000                                   | 29 700                             | 413                           | 15 565                              | 216                                   | 48                  | 14 715           | 24 145                       | 24.4             | 4 325            |
| Cautín                                    | 216 735    | 150 000                 | 69.2             | 105 375                                  | 66 385                             | 443                           | 43 636                              | 292                                   | 34                  | 30 450           | 46 480                       | 21.5             | 9 360            |
| Valdivia                                  | 156 485    | 112 460                 | 71.9             | 49 895                                   | 34 930                             | 311                           | 24 350                              | 217                                   | 30                  | 20 775           | 68 155                       | 43.6             | 12 550           |
| Osorno                                    | 91 930     | 64 320                  | 70.0             | 33 645                                   | 23 890                             | 372                           | 18 690                              | 290                                   | 22                  | 12 470           | 44 225                       | 48.1             | 8 580            |
| Llanquihue                                | 108 475    | 69 930                  | 64.5             | 49 420                                   | 34 595                             | 495                           | 26 950                              | 385                                   | 22                  | 13 115           | 33 695                       | 31.1             | 6 315            |
| Chiloé                                    | 36 030     | 26 080                  | 65.6             | 14 920                                   | 11 190                             | 429                           | 6 671                               | 248                                   | 40                  | 4 915            | 7 540                        | 19.8             | 1 405            |
| Aysén                                     | 37 460     | 17 845                  | 53.3             | 15 035                                   | 9 020                              | 505                           | 3 460                               | 194                                   | 61                  | 3 655            | 3 425                        | 10.2             | 635              |
| Magallanes                                | 64 430     | 69 960                  | 82.9             | 50 110                                   | 30 065                             | 430                           | 24 660                              | 352                                   | 18                  | 17 065           | 60 070                       | 71.1             | 14 310           |
| Sub-total                                 | 3 382 930  | 2 384 190               | 70.5             | 1 203 980                                | 972 430                            | 408                           | 702 130                             | 295                                   | 28                  | 434 430          | 1 122 475                    | 33.2             | 223 330          |
| Valparaíso and Viña del Mar <sup>4/</sup> | 460 040    | 303 410                 | 65.9             | 246 240                                  | 211 425                            | 695                           | 143 770                             | 475                                   | 32                  | 69 910           | 345 000                      | 75.0             | 68 000           |
| Concepción <sup>6/</sup>                  | 190 680    | 118 580                 | 62.2             | NA                                       | 53 568                             | 450                           | 42 855                              | 362                                   | 20                  | 23 390           | 65 435                       | 34.3             | 12 910           |
| Talcahuano <sup>6/</sup>                  | 158 340    | 134 020                 | 84.6             | NA                                       | 43 632                             | 325                           | 34 905                              | 260                                   | 20                  | 15 050           | 88 415                       | 55.6             | 16 525           |
| Santiago Metropolitan <sup>5/</sup>       | 3 260 620  | 2 610 435               | 80.0             | NA                                       | 1 622 160                          | 620                           | 1 209 600                           | 465                                   | 26                  | 338 435          | 1 553 335                    | 47.6             | 313 750          |
| Grand Total                               | 7 452 630  | 5 550 655               | 74.5             | -  | 2 903 215                          | 523                           | 2 133 260                           | 385                                   | 27                  | 1 131 275        | 3 174 660                    | 42.6             | 634 415          |

<sup>1/</sup> Source: Dirección de Obras Sanitarias (DOS) Empresa de Agua Potable (EAPS)

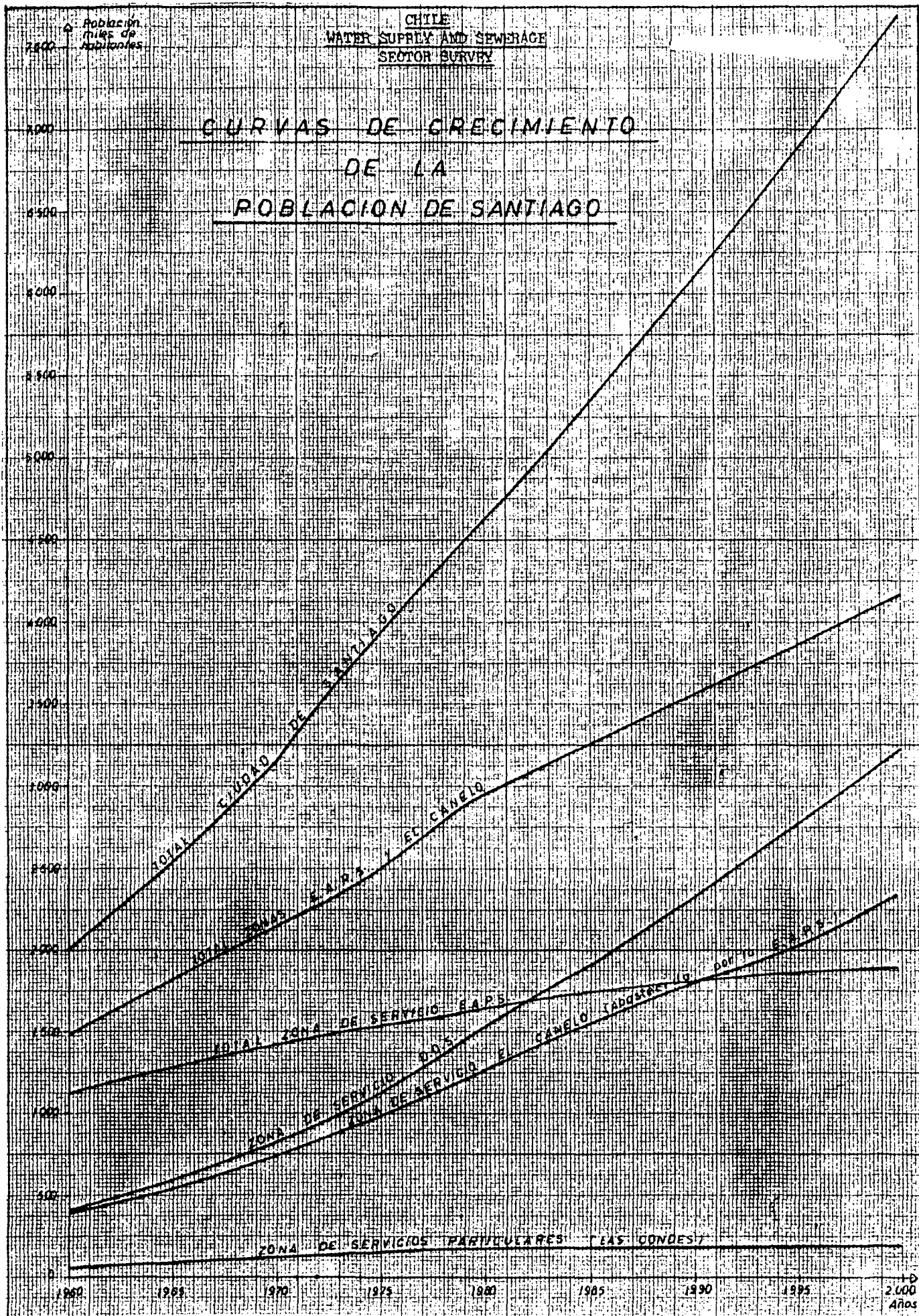
<sup>2/</sup> Water production had to be estimated taking into consideration the limitations of pumping and treatment capacities of respective systems, since in practically all systems water production is not metered.

<sup>3/</sup> Unaccounted-for-water. These figures represent the difference between water production and consumption. Sufficient information was not available to classify the kinds of UPW.

<sup>4/</sup> The cities of Valparaíso and Viña del Mar have been listed separately from the rest of the Province.

<sup>5/</sup> The metropolitan area of Santiago has been listed separately from the rest of the Province, and since the area represents approximately 44% of the urban population is treated as a separate entity throughout the report. This is served by EAPS; El Canelo; DOS; Municipal de Maipú; Las Condes; and other private companies.

<sup>6/</sup> The cities of Concepción and Talcahuano are practically twin-cities, taking their domestic water supplies from the same source and being treated at the same treatment plant. They are listed separately from the rest of the Provinces.



DTTE  
 WATER SUPPLY AND SEWERAGE  
 SECTION SURVEY

DEMANDA MEDIA ANUAL  
CIUDAD DE SANTIAGO

ml/seg.

PRODUCCION AGUA TOTAL E.A.P.S.

PRODUCCION AGUA TOTAL S.T.G.O.

TERCERA PLANTA DE TRATAMIENTO  
 V.R. 100,000

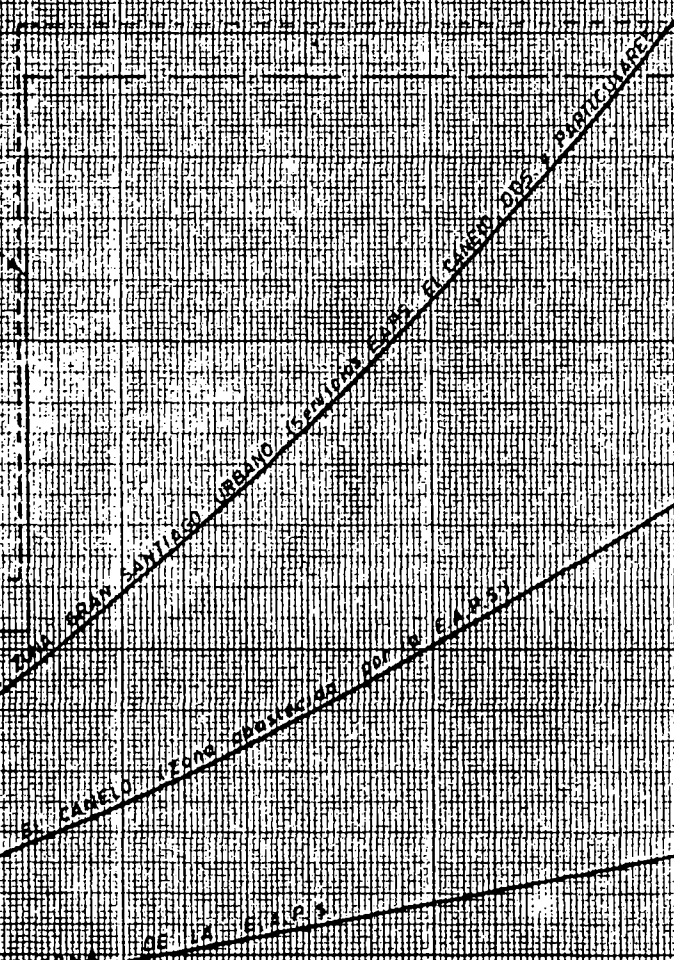
AMPLIACION PLANTAS  
 YERBAHUELOS Y VIECHINGAS  
 100,000

PLANTA DE MICROFILTROS  
 LA ZORA  
 200,000

PLANTA  
 LAS VIZCACHINAS  
 400,000

ZONA VECINALES Y SUBURBIO DE P.O. S.T.G.O.

ZONA DE LA E.A.P.S.



1960 1965 1970 1975 1980 1985 1990 1995 2000 años

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 21 Appendix F

Résumé of Professional, Technical and Administrative Personnel Employed in the Sector<sup>1/</sup>. October 1974

| Personnel Category                       | Sector Agencies |     |      |     |     |                     |
|--|-----------------|-----|------|-----|-----|---------------------|
|  | DOS             | DSS | EAPS | OSR | SHA | EMDVV <sup>2/</sup> |
| <u>PROFESSIONAL</u>                      |                 |     |      |     |     |                     |
| Engineers                                | 56              | 40  | 18   | 6   | 11  | 14                  |
| Construction Supervisors                 | 59              | 56  | 28   | 1   |     |                     |
| Chemists/Bacteriologists                 | 9               |     | 2    |     |     |                     |
| Technicians/Inspectors                   | 83              | 24  | 104  |     |     |                     |
| Accountants                              |                 |     |      | 4   |     |                     |
| Auditors                                 |                 |     | 1    |     |     |                     |
| Economists                               |                 |     | 3    | 1   |     |                     |
| Attorneys                                |                 |     | 9    |     |     |                     |
| Physicians                               |                 |     | 8    |     |     |                     |
| Dentists                                 |                 |     | 5    |     |     |                     |
| Sub-total                                | 207             | 120 | 178  | 12  | 11  | 14                  |
| <u>ADMINISTRATIVE</u>                    |                 |     |      |     |     |                     |
| Administration                           | 1272            | 64  | 383  | 4   | 45  | 75                  |
| Personnel                                |                 | 3   |      | 1   |     |                     |
| Accounting                               |                 |     | 21   | 11  |     |                     |
| Technical Officers                       | 447             | 60  | 249  | 3   |     |                     |
| Sub-total                                | 1719            | 127 | 653  | 19  | 45  | 75                  |
| <u>LABOURERS AND AUXILIARIES</u>         | 6779            | 66  | 577  | 34  | -   | 129                 |
| Grand total                              | 8705            | 313 | 1408 | 65  | 56  | 218                 |
| <u>Personnel Shortages <sup>3/</sup></u> |                 |     |      |     |     |                     |
| Total                                    | 230             | 35  | NA   | NA  | NA  | NA                  |
| Professional                             | 178             | 17  |      |     |     |                     |
| Administrative                           | 52              | 18  |      |     |     |                     |

<sup>1/</sup> Information provided by respective agencies. Classification by discipline or departmental affiliation not generally provided, e.g. "Administration" may include staff working as Technicians/Inspectors, Auditors or in Personnel or Accounting units. Only EAPS reports full detail, see also Table 18.1.

<sup>2/</sup> Empresa Municipal De Desagues De Valparaiso y Vina Del Mar.

<sup>3/</sup> As assessed by agencies themselves.

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Résumé of Staff Personnel in EAPS  
October 1974

Table 21.1 Appendix F

| Personnel Category               | Departments |               |          |                        |                |                            | Total |
|----------------------------------|-------------|---------------|----------|------------------------|----------------|----------------------------|-------|
|                                  | President   | Administrator | Services | Studies & Construction | Administration | Coordination and Materials |       |
| <u>PROFESSIONAL</u>              |             |               |          |                        |                |                            |       |
| Engineers                        | 1           | 1             | 5        | 7                      | 1              | 3                          | 18    |
| Construction Supervisors         |             |               | 22       | 4                      |                | 2                          | 28    |
| Chemists                         |             |               | 1        |                        |                |                            | 1     |
| Bacteriologists                  |             |               | 1        |                        |                |                            | 1     |
| Technicians                      |             | 1             | 8        | 2                      | 19             | 10                         | 40    |
| Inspectors                       |             |               | 43       |                        | 16             | 5                          | 64    |
| Auditors                         |             | 1             |          |                        |                |                            | 1     |
| Economists                       |             |               |          |                        |                | 3                          | 3     |
| Attorneys                        |             | 8             |          |                        |                | 1                          | 9     |
| Physicians                       |             |               |          |                        |                | 8                          | 8     |
| Dentists                         |             |               |          |                        |                | 5                          | 5     |
| Sub-total                        | 1           | 11            | 80       | 13                     | 36             | 37                         | 178   |
| <u>ADMINISTRATIVE</u>            |             |               |          |                        |                |                            |       |
| Administration                   | 11          | 14            | 92       | 9                      | 136            | 121                        | 383   |
| Accounting                       |             |               |          | 2                      | 15             | 4                          | 21    |
| Technical Officers               |             | 3             | 152      | 1                      |                | 93                         | 249   |
| Sub-total                        | 11          | 17            | 244      | 12                     | 151            | 218                        | 653   |
| <u>LABOURERS AND AUXILIARIES</u> |             |               |          |                        |                |                            |       |
|                                  | 5           | 4             | 421      | 2                      | 49             | 96                         | 577   |
| Grand Total                      | 17          | 32            | 745      | 27                     | 236            | 351                        | 1408  |

CHILE  
WATER SUPPLY AND SEWERAGE  
SECTOR SURVEY

Table 22 Appendix F

National Production Of Asbestos-Cement Pipe For DOS  
1962 - 1974

( in linear meters by pipe diameters )

|                                 | 50    | 75      | 100     | 125    | 150    | 200    | 250    | 300    | 350    | 400    | M2        |
|---------------------------------|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|-----------|
| <u>AÑO 1962</u>                 |       |         |         |        |        |        |        |        |        |        |           |
| (Dde. 1° Junio)                 | 3.780 | 75.784  | 72.176  | 25.064 | 21.636 | 14.008 | 7.358  | 2.444  | -      | -      | 253.000   |
| Término medio mens.             | 540   | 10.829  | 10.314  | 3.582  | 3.092  | 2.002  | 1.051  | 349    | -      | -      | 36.400    |
| <u>AÑO 1963</u>                 | 304   | 63.616  | 69.467  | 20.058 | 44.398 | 52.165 | 3.652  | 1.652  | 280    | 248    | 366.000   |
| Término medio mens.             | 25    | 5.301   | 5.788   | 1.671  | 3.700  | 4.347  | 285    | 138    | 23     | 21     | 30.500    |
| <u>AÑO 1964</u>                 | 1.296 | 91.062  | 108.852 | 20.732 | 37.730 | 47.551 | 10.547 | 3.546  | 76     | -      | 429.000   |
| Término medio mens.             | 108   | 7.588   | 9.070   | 1.727  | 3.144  | 3.963  | 879    | 295    | 6      | -      | 35.700    |
| <u>AÑO 1965</u>                 | 1.436 | 90.843  | 102.841 | 30.811 | 34.745 | 19.221 | 12.962 | 3.679  | 4.884  | 353    | 408.000   |
| Término medio mens.             | 120   | 7.570   | 8.570   | 2.567  | 2.895  | 1.602  | 1.080  | 307    | 405    | 29     | 34.000    |
| <u>AÑO 1966</u>                 | 1.006 | 103.184 | 87.993  | 28.884 | 85.504 | 41.661 | 8.051  | 13.273 | 8.152  | 2.524  | 635.000   |
| Término medio mens.             | 84    | 8.598   | 7.332   | 2.407  | 7.125  | 3.472  | 671    | 1.106  | 679    | 210    | 52.900    |
| <u>AÑO 1967</u>                 | 484   | 80.370  | 93.566  | 28.460 | 48.354 | 24.070 | 9.596  | 19.360 | 2.580  | 2.045  | 510.234   |
| Término medio mens.             | 36    | 6.697   | 7.797   | 2.372  | 4.029  | 2.006  | 800    | 1.613  | 215    | 170    | 42.519    |
| <u>AÑO 1968</u>                 | 534   | 84.660  | 84.266  | 74.750 | 49.156 | 28.271 | 48.136 | 9.110  | 1.900  | 6.430  | 719.571   |
| Término medio mens.             | 44    | 7.055   | 7.022   | 6.229  | 4.096  | 2.356  | 4.011  | 759    | 158    | 536    | 59.964    |
| <u>AÑO 1969</u>                 | 772   | 74.900  | 80.190  | 22.643 | 22.435 | 17.425 | 14.658 | 8.695  | 2.720  | 2.835  | 393.180   |
| Término medio mens.             | 64    | 6.242   | 6.682   | 1.887  | 1.869  | 1.452  | 1.238  | 725    | 227    | 236    | 32.765    |
| <u>AÑO 1970</u>                 | 320   | 26.008  | 53.944  | 19.760 | 31.865 | 17.300 | 18.960 | 6.925  | 6.135  | 1.710  | 380.585   |
| Término medio mens.             | 27    | 2.167   | 4.495   | 1.647  | 2.655  | 1.442  | 1.580  | 577    | 511    | 142    | 31.715    |
| <u>AÑO 1971</u>                 | 2.820 | 108.996 | 168.568 | 45.820 | 59.065 | 35.430 | 14.360 | 9.748  | 22.090 | 52.300 | 1.342.871 |
| Término medio mens.             | 235   | 9.083   | 14.047  | 3.818  | 4.922  | 2.953  | 1.197  | 812    | 1.841  | 4.358  | 111.905   |
| <u>AÑO 1972</u>                 | -     | 20.744  | 27.152  | 2.425  | 5.585  | 1.690  | 2.910  | 1.585  | 2.100  | -      | 91.166    |
| Término medio mens.             | -     | 1.729   | 2.263   | 202    | 465    | 141    | 242    | 132    | 175    | -      | 7.597     |
| <u>AÑO 1973</u>                 | -     | 5.232   | 7.688   | 1.700  | 6.150  | 1.160  | 2.230  | 7.655  | 4.420  | 1.965  | 141.026   |
| Término medio mens.             | -     | 436     | 641     | 142    | 513    | 97     | 186    | 638    | 368    | 164    | 11.752    |
| <u>AÑO 1974 to 30 Sep. 1974</u> | -     | 64.204  | 83.920  | 30.436 | 37.980 | 35.910 | 23.330 | 41.050 | 56.410 | 11.125 | 1.260.580 |
| Término medio mens.             | -     | 7.134   | 9.324   | 3.382  | 4.220  | 3.990  | 2.592  | 7.561  | 6.268  | 1.236  | 140.664   |



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