Wastewater Generation and Treatment Statistics in Chile: Essential Topics, Problems and Solutions.

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Statistics on water resources in Chile constitute a part of the capital of existing information. They are of long date, except for those where the new requests and the natural technical evolution have permitted new information to be generated, as for example, water processing served and of liquid industrial residues. This is a brief outline of the subject.

This information is generated by a diverse range of State agencies. In the case of drinking water, private enterprises are the responsible for abstraction, treatment and distribution. These enterprises are also responsible for the measurement of the chemical, physical, and bacteriological water quality. These procedures are controlled by the Superintendence of Sanitary Services (SISS) that requests water quality information from them in order to evaluate water management, controls and analysis.

The National Direction of Water (DGA) of the Department of Public Works, measure water quantities in rivers, reservoirs and dams, and the Direction of Irrigation measures water quantities in irrigation channels. The measurement of other bodies of water lies with the Direction of the Maritime Territory and merchant marine (DIRECTEMAR) which measures emissions and the quality of the water especially in lakes and coastal borders.

ESSENTIAL TOPICS OF THE INFORMATION

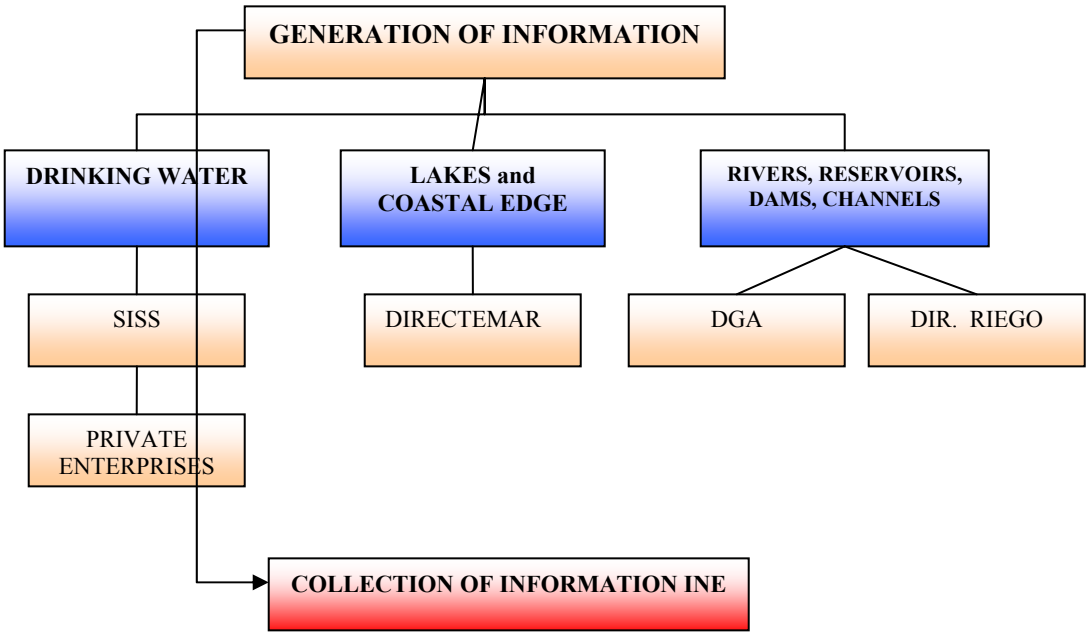
In the case of the water, the information refers mainly to the production and consumption of drinking water in urban and populated rural areas, concentrating on the fulfillment of water quality requirements. There are also statistics on the population supplied with drinking water and connected to sewer systems. Monthly availability in reservoirs and dams is monitored and information on emissions is generated also, including water processing, water discharges volume and volume of liquid industrial residues poured into water courses and sewer systems. The quality of water in rivers is measured for some lakes and in the main bays.

Each of the agencies responsible for water in Chile has a range of functions according to the respective law.

INSTITUTIONAL ARRANGEMENTS, GENERATION AND COLLECTION OF DATA

Each agency has its own functions and has tools and procedures for the fulfillment of its functions by mandate of the law. The INE seeks to fulfill its national and international reporting obligations on water and the environment, using the framework of the National Statistical System (SEN) and in particular the System of Environmental Statistics (SEA) to support such reporting.

The agencies involved in the different aspects of water and water statistics (Superintendence of Sanitary Services, General Direction of Water, Direction of the Maritime Territory and Merchant Marine, Business of drinking water in Santiago (Andean Water) and other agencies with environmental responsibilities, besides the National Commission of the Environment), are consulted periodically by the INE for the purpose of developing the Yearbook of Statistics of the Environment and also to provide national environment statistics to international organizations.



INE: Instituto Nacional de Estadísticas
SISS: Superintendencia de Servicios Sanitarios
DGA: Dirección General de Aguas
DIRECTEMAR: Dirección del Territorio marítimo y Marina Mercante
DIR. RIEGO: Dirección de Riego

WASTEWATER GENERATION AND TRETMENT

For wastewater, the main variables measured are given below. The list is not exhaustive.

- **Sewer system**
  - Population connected to sewer system
  - Coverage of sewer system

Discharges

- Volume of water discharged to sewer systems
- Volume of liquid industrial residues discharged by sanitary companies and industries, by region
- Total volume of residual water generated to sewer systems
- Number of industries and the types of associated discharges (sewer system, surface water courses, infiltration, irrigation)

Treatment

- Number of domestic residual water processing plants and capacity by region
- Coverage of served water treatment

Quality of the water

- Drinking water: percentage meeting the bacteriological quality standards, disinfections, chemical and physical parameters
- Water courses, mainly lakes and coastal zones: chemical and physical parameters

PROBLEMS FACED WHEN COMPLETING THE QUESTIONNAIRES

Below are some of the most typical problems that arise when attempting to answer questionnaires from international agencies. The next problems are general, but in Chile they are smaller.

- General problems, in order of difficulty, from simplest to most difficult :
  - dispersion of the sources of information,
  - diverse methodologies used to collect and generate data,
  - diverse methodologies used for analysis and evaluation,
  - different units of measures,
  - different periodicities of data collection and cycles,
  - different geographical coverage and areas (units).
- A problem of great importance is the lack of metadata explaining how the how different information has been processed. Sometimes information is processed according to national norms and in other cases according to the international norms. A possible solution would be greater coordination and dedication to joint work with the specialists
- Specific problems come up when international questionnaires ask for a diverse range of variables, and where the breakdown of the information is not consistent

with the national breakdown. Also problems occur where there are differences in definitions between international questionnaires and those used in the country.

- ❖ Administrative constraints create a range of problems and these constraints include a lack of personnel, (the most important constraint), the time required to provide answers for a questionnaire, especially where the data is not directly available or is received late.
- ❖ An important underlying problem can be the lack of statistical culture, especially with regard to care of the information, lack of quality control, and no opportunity for training those responsible for generating the information.

SPECIFIC PROBLEMS FOR VARIABLES OF THE PNUD QUESTIONNAIRES

Wastewater Generation

Partial data or do not exist on:

- Mines and quarries
- Production and distribution of electricity
- Construction
- Other economic activities

Discharges of effluents and Pollution

- The points of discharges are known
- They lack data of the total volume of residual water generated
- Pollution. Measures only in main bodies of water. They lack points of sampling.

Wastewater treatment

The information refers to a preliminary processing and to secondary and primary processing but is not itemized on:

Degrees of Processing

- Biological
- Of tip Processing
- Treated water in other plants of processing

Treatment capacities

The processing plants number is known well, the design of capacity, volume and discharged treatment water to the courses of water too.

Population connected to independent services of water processing.

Without information

Sewage sludge

The data do not specify the volume of resultant matters of the preliminary processing (to remove sands and greases) of the resultant volume of sludge from secondary and primary processing.

SOLUTIONS

- A solution undertaken by the INE is a project of Harmonization of Environmental Statistics, which would ensure and require greater quality of information, and improve the delivery of data according to the objectives, and would assist in ensuring figures have international comparability. The development of this project requires closer working relations and consultations between specialists from each agency, commitments to deliver the data and to improve the data quality, and would finally help to promote a statistical culture.
- The Institute of Statistics needs to give more support to the Units of Environment responsible for completing the questionnaires from international agencies.

HARMONIZATION OF ENVIRONMENT STATISTICS

At present the INE is in charge of developing the project "Harmonization of the Environmental Statistics", whose purpose is to manage the information in order to provide data for national and international requests. This will be done by means of a data platform/framework that permits the international comparability of the figures, particularly with the OECD and EUROSTAT, and by applying quality attributes to the information, based on administrative registrations.

The project began with the implementation of a process (technical-methodological slip) designed to obtain from the agencies the metadata and methodologies for the data they collect, A spin off has been the generation of a contact list of specialists.

The next step was to compile and compare lists of variables used in the Environmental Statistic Yearbook of INE, and other services.

The next step is to complete the list with PNUD and OCDE variables, and to study definitions, units of measures and other characteristics for each one.

The project is framed in the System of Environmental Statistics to utilize its instruments and main tools.

THE SYSTEM OF ENVIRONMENTAL STATISTICS (SES)

The INE has developed a System of Statistics of Environment that will allow the improvement of information available and the development of indicators to satisfy Chile's own needs with useful, necessary, timely and good quality information which would also be comparable to international data.

The country will establish a basic platform or framework based on essential statistical processes, to ensure we have useful, transparent, and dependable data, systematic registration, and regular diffusion with solid statistical validity. Consequently, the information systems, the comparison of variables and the derived indicators will have the solidity and necessary consistency to be used in decision making.

The System of Environmental Statistics (SES) is part of the framework of the National Statistical System and acts as a central column for environment statistics and the integration of the statistics between the state agencies and companies that are involved in water statistics. The INE acts as a coordinating entity in the collection and presentation of the information. It acts in conformity with the respective law (Organic Law) giving the data an official character through the validation and further publication in specialized publications. This information is also used for the construction of water and environment indicators.

The INE coordinates, through the System of Environmental Statistics, a Committee of Environmental Statistics that includes representatives of State agencies involved in the environment, for the purpose of obtaining and systematizing processing and tabulating the information and official dissemination of information.

The main objectives of the System are:

- To manage environmental information, bringing together data of different origins, processing and disseminating good quality data series.
- To compile comparable, timely and good quality information (systematic registration of data),
- To obtain new information through surveys, such as the first Survey of Environmental Management in Industry (for the year 2001) in order to develop and generate environmental indicators
- To put together a contact list of Directors of Institutions and National Experts on the matter.
- To ensure files and data are referenced to the relevant metadata and are referenced to the methodologies used to obtain the information.
- To respond to the requests of international agencies.
- To disseminate official data through yearbooks, bulletins, compact disks and the Internet.

The Instruments of the System

The system uses instruments and tools in order to achieve proposed goals.

- **The National Plan of Statistical Collection (NPSC):** this document has the rank of Supreme Decree; it was made official by the signature of the Head of State, and sets out on a yearly basis the statistical obligations of the Agencies of the State toward the INE.
- **The Annual Operating Program (AOP)** that indicates all the activities and products that the INE should perform each year.
- **Inter-institutional Committee of Environmental Statistics,** formed by representatives of each agency involved in the System to support all agencies responsible for the coordination of the System.

Participating agencies of the system

- Andean Water
- Chilean Commission of Nuclear Energy
- National Commission of Energy
- National Commission of the Environment
- Forest National Corporation
- Ecological and Forest Department of Carabineers of Chile
- General Direction of Water
- Direction of Highway Administration
- General Direction of the Maritime Territory and of merchant marine
- Weather Direction of Chile
- Chilean Antarctic Institute
- Military Geographical Institute
- National Institute of Statistics
- Office of Studies and Agrarian Politics
- National Office of Emergency
- Ministerial Regional Office of the secretary of Health Metropolitan Region
- Agricultural Service and Cattle Raiser
- Hydrographic Service and Oceanographic of the Armada of Chile
- National Service of Geology and Mining Industry
- Service Seismological (University of Chile)
- Superintendence of Sanitary Services

PROJECTIONS

The INE has worked jointly with the Economic Commission for Latin America and the Caribbean (CEPAL) in preparing the requested information and the proposed technical guidelines to ensure that the countries of the region have a platform of comparable data. Previously (2001- 2001), it worked jointly with CEPAL and INEGI of Mexico, to show the countries of CEPAL the System of Environmental Statistics in detail.

The National Commission of the Environment (CONAMA), has agreed to cooperate with this project, and through it with the State agencies in the Committee of Environmental Statistics, so as to coordinate and systemize the processes and coverage of data production & collection, to improve delivery of quality data, and to reduce as far as possible the gap between supply of data and the demand for data.

ANNEX

The technical slip applied to the Services is shown below.

INSTITUTO NACIONAL DE ESTADÍSTICAS
SUBDIRECCIÓN DE OPERACIONES
SUBDEPTO. ESTADÍSTICAS MEDIOAMBIENTALES

IT PUTS ON FILE TECHNICAL ENVIRONMENTAL STATISTICS

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Name of the Unit responsible for the generation of the data				
Information source type	**Number:** **Comments:**			
*** Information source type: 1. Census. 2. It shows. 3. Station of monitoring. 4. Administrative registration. 5. Teledetección. 6. Indirect estimation. 7. Other, to specify.**				
Methodology of obtaining of the registration				
Responsible	**Name:** **Charge:** **e-mail:** **Telephone:**			
Observations				