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**Istat experience on surveying water statistics:
the Water Survey System questionnaires**

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1. Introduction

In order to evaluate the state of the environment and to define a sustainable development it is necessary to have an efficient information system built on a set of significant and exhaustive variables/indicators; to fill this system it is also necessary to have good quality data. The two processes of defining a conceptual framework of indicators and of collecting data are not independent: theoretical definition of an indicator must drive the effort for the production of requested information; data collection helps to understand the actual data availability.

In this paper it is described the action the Italian Institute of Statistics is carrying on building water statistics.

Referring to 1999, Istat is conducting the new survey on water. With respect to the previous ones (1951, 1963, 1975, 1987, 1993) the present survey is renewed from many point of view because of the arising innovation and the growing importance the water use reached in the last years.

The survey is also partially funded by the European Commission (Regional and Cohesion Policy Directorate) for the development of a regional environmental statistics information system. This opportunity allows Istat to better create the necessary feedback, previously described, between theoretical indicators definition and data collection.

2. The Water Survey System

Water is a strategic resource for life survival. It is necessary to analyse the uses of this resource made by household and by production activities to evaluate its sustainability. The main direct impacts water use cycle generates deal with abstraction and discharge: the first one depletes resources, the second one produces pollution. About municipal water use a problem of constrained optimisation needs to be solved: to minimise water resource depletion and pollution with the constraint of ensuring a good quality of drinking water and an adequate sewerage service to population.

To solve this problem it is necessary to have a good information system about:

- water flows
- water quality (both at the beginning and at the end of the cycle)
- state of facilities
- costs
- management
- connected population

The survey field of observation is described in figure 1. The water use cycle referring to public potable water and municipal wastewater is considered. Facilities relevant to water used exclusively by agriculture and industry are not included.

About water flow the cycle includes the following elements:

- for potable water → abstraction, conveying, supply;
- for municipal wastewater → collection, treatment, discharge.

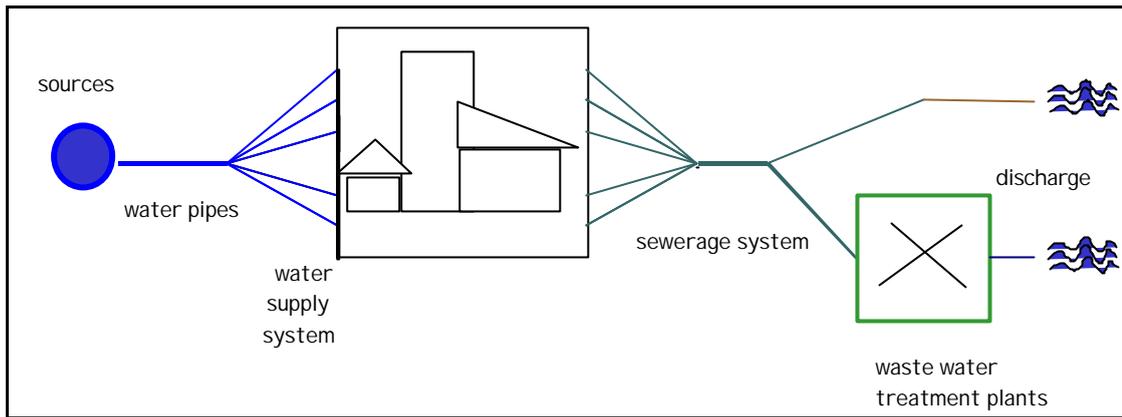


Figure 1. Phenomena scheme

In Italy there is a wide fragmentation of water use cycle management: from a statistical point of view the problem is that information belongs to different kind of observation units.

Data collection requires the definition of a surveys set using different questionnaires. It is important to define also a *system* to ensure the possibility of reconnecting data after the collection phase and to describe the entire phenomena.

On the basis of his long experience, Istat defined a Water Survey System (WSS) composed by six plus one sub-surveys using different questionnaires and responding units. The questionnaires are self-administered.

In figure 2 the phenomena scheme is represented using the WSS framework.

In 1999 Istat sent the preliminary survey questionnaire to the 8099 existing Municipalities to define a database of water management companies operating in Italy.

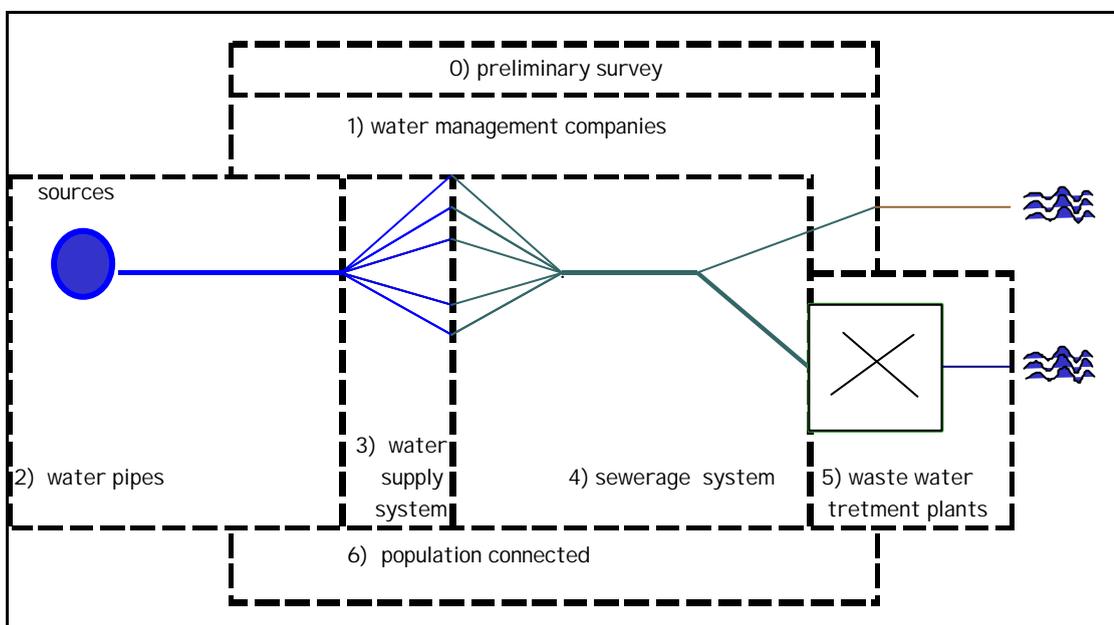


Figure 2. Water Survey System scheme

In 2000 a second stage started: five questionnaires regarding each water cycle segment (water pipes, water supply system, sewerage system, wastewater treatment plants) has been sent to the correspondent management companies. A last questionnaire has been sent to each Municipality to collect data about population connected to water services.

In the next table the questionnaires system is explained.

Table 1. Water Survey System (1999)

QUESTIONNAIRES	RESPONDING UNITS
0) Preliminary survey	Municipalities
1) Management company information	Water management companies
2) Water pipes	Water pipes management companies
3) Water supply system	Water supply system management companies
4) Sewerage system	Sewerage system management companies
5) Municipal wastewater treatment plants	Wastewater management companies
6) Population connected	Municipalities

3. The Water Survey System questionnaires

In order to avoid duplication of surveys, a research has been conducted at the beginning to analyse existing data on water among administrative offices or other institutes. As result, this research stressed the necessity of the Istat survey because of the almost poor quality of water data produced or the low coverage. Where information was available there was an incompatibility among different fonts. This is particularly due to the lacking of homogeneity in definitions. At this regard, it is important the work different countries, Italy included, are doing about the revision of the Joint OECD/Eurostat questionnaire on water.

To define questionnaires content Istat set up a Committee with representatives of:

- Ministry of Public Works
- Ministry of the Environment
- Ministry of Health
- Regions
- Research Institutes
- Academic world
- National Environment Agency
- Trade associations

Committee works lasted about one year, and at the end Istat collected all requirements trying to translate them into feasible questions. To evaluate the actual availability of required information Istat conducted a pre-test. The pre-test results stressed the difficulty in collecting this kind of data. What Istat tried to do is to optimise the production process in the long period using this survey as first step towards methods and definitions standardisation.

Main issues considered into questionnaires are briefly described in table 2.

At present Istat is concluding data collection and the data check procedures are in a running phase.

Table 2. WSS questionnaires content

0) Preliminary survey questionnaire

Municipality connected to:

- water supply system (yes/no);
- water pipes (yes/no);
- sewerage system (yes/no);
- wastewater treatment plants (yes/no).

Management companies operating in municipality and services managed

1) Management companies questionnaire

Identification data (name, address,)

Legal status

Costs, sales, investments

Workers

2) Water pipes questionnaire

Municipalities connected to water pipe

Water delivered to municipalities and other water pipes

Abstraction by type of source (spring, wells, water courses, natural lakes, artificial reservoirs, sea water and transitional water) and location

Water treated

Percentage of water pipe losses

Building materials

3) Water supply system questionnaire

Volume of water invoiced

Water supply

Water invoiced by use

Water pipes connected to municipal water supply system

Percentage of water supply system losses

Building materials

Length

4) Sewerage system questionnaire

Waste water treatment (yes/no)

Destination of not treated waste water (water body and municipality)

5) Municipal wastewater treatment plants questionnaire

Type of treatment

Population equivalent connected

Municipalities connected

Waste water treated

Sewage sludge production and disposal

Quality input/output (concentration of BOD, COD, suspended solids, phosphorus, nitrogen)

6) Population connected questionnaire

Population connected to water pipes system

Population connected to sewerage system

Population connected to wastewater treatment plants
