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Challenges in the Organisation of Environmental Statistics

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1. Introduction

The objective of this paper is to draw attention to the organisational problems of environmental statistics, which are linked to inadequate definition of the framework of environmental statistics. In the background of the paper are several working groups focused on improving the effectiveness of the national statistical service in Finland. The material of this paper is mostly based on the report of the so-called YLE working group (YLE 2009); however, the conclusions and opinions in this paper are mine.

A much more ambitious summary of environmental statistics has been done in Sweden (Environmental statistics in Sweden 2008). At the moment, I did not have the possibility to compare it with experiences in Finland, but preliminarily it seems that the problems are quite similar.

2. Generation of information on social development

In order to meet the different social information needs it is important to recognise the totality of environmental statistics and to define its borders. In order to define the scope of environmental statistics it is necessary to analyse the roles and characteristics of:

- National statistical services,
- Administrative and research reports, and
- Control and monitoring data saved in information systems.

Large systems of administrative control, monitoring and research information interact with the system of national statistical services. The way these systems operate, their aims and their steering differ from statistical information systems.

National Statistical Services

The function of national statistical services is to meet the general information needs of society by producing statistics that describe social conditions and their development for common use. The EU legislation defines statistics as "quantitative and qualitative, aggregated and representative information characterising a collective phenomenon in a considered population." (EU 2009) Statistics are not interested in and do not describe individual observations or objects of the data. Repetition, continuity and comparativeness over time are typical features of statistics. Official statistics are meant to be publicly disseminated free of charge.

The statistical process consists of the collection, processing, analysing and disseminating of information. Before it the needs of statistics are specified from the view of society and users of statistics. The basic information of statistics can be collected into statistical registers on such a level that is necessary for the statistical process. Very often the source for the basic information is a register maintained by the government.

In Finland data on individual enterprises or persons collected into statistical registers are confidential according to the Finnish Statistics Act even if the original source of information is a public source. The information of statistical registers cannot be used for any administrative process that is directed to the object of the information.

Research

A very important part of environmental information is produced by research organisations, such as MTT Agrifood Research, the Finnish Forest Research Institute (Metla), the Finnish Game and Fisheries Research Institute (RKTL) and the Finnish Environment Institute (SYKE). They also compile an essential share of environmental statistics.

The outputs of research organisations seldom have the same kind of repetition, continuity and regularity as official statistics. Unlike statistical data, the data on single units in research registers can be submitted for administrative decision-making.

Along with primary research these organisations produce in the frameworks of different monitoring programmes monitoring information, which is saved in administrative registers. Monitoring information is used, for instance, for different kinds of reporting systems. The difference between reporting systems and official statistics is lack of representativeness.

Register information

Registers are crucial information sources for official statistics in Scandinavian countries. According to the Finnish Statistics Act government organisations have to submit their register data to statistical authorities if needed. In contrast, statistical authorities do not have the right to submit revised register data in identified form for statistics to any government or private

organisation. The prohibition also concerns the government organisation maintaining the register in question.

Differing from official statistics:

- Use and dissemination of unit level data of the information collected by other government organisations are allowed,
- The coverage of the information is not regulated with the same kind of requirements as statistical information, and
- It is not generalised to represent the state of the total population.

3. Management of environment and natural resources information

Environmental monitoring and reporting

Information about changes in the state of the environment is collected by environmental monitoring systems. (See Environmental monitoring in Finland 2009-2012). Monitoring is based on long-term individual, comparable observations. The data are saved into information systems. Analysis and reporting of the information are an essential part of monitoring. The main actors in the organisation of environmental monitoring in Finland are the Ministry of the Environment, the Ministry of Agriculture and Forestry, and the Ministry of Social Affairs and Health.

Environmental, natural resource and energy issues are monitored by at least 40 governmental bodies in Finland. According to the database of international obligations maintained by the European Environmental Agency, Finland has more than 350 obligations on environmental issues.

Table 1. Finland's reporting obligations on the environment

	Obligations
European Commission/DG-ENV	144
HELCOM	59
OSPAR	26
UN	25
European Environmental Agency	17
Ramsar Convention	15
Bern Convention	11
CITES	11
Eurostat	9

Others (19 organisations)	42
Total	**359**

HELCOM	Convention on the Protection of the Marine Environment of the Baltic Sea Area
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
Ramsar Convention	The Ramsar Convention on Wetlands
Bern Convention	Convention on the Conservation of European Wildlife and Natural Habitats
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora

The national statistical service also has several reporting obligations on environmental issues. Usually they are not called reports but statistics, because information is not provided for the control or administrative purposes. In addition, they follow strict norms of compilation of statistics in their definitions, classifications and methods. In some cases, such as waste reporting to the EU, Statistics Finland compiles statistics in connection with the report of the Ministry of the Environment for monitoring of waste directives.

Environmental administration has 40 information systems, of which the Compliance Monitoring Data system - VAHTI is the most important. The VAHTI compliance data system functions as a tool for the 13 regional environment centres in their work on processing and monitoring environmental permits. The data system contains information on the environmental permits of clients and on their wastes generated, discharges into water and emissions to air. In future, the system will also include information on noise emissions. These baseline data are used by the environment centres and by other interested parties.

VAHTI is an important data source for waste statistics, the greenhouse gas inventory and energy statistics at Statistics Finland. Because of the shortcomings and quality problems in the VAHTI system Statistics Finland has to use a considerable workload for cross-checking and completing the data.

Environmental and natural resource statistics

In the DPSIR framework the logical action fields for official statistics are driving forces, pressures and responses. Statistics Finland is responsible for driving force statistics, such as statistics on economic development, population and energy. Statistics Finland produces statistics on solid waste and greenhouse gas emissions and the Finnish Environment Institute is in charge of wastewater statistics and partly of air emissions. Response statistics - environmental taxes, expenditures and production of environmental goods and

services - are exclusively in the hands of Statistics Finland. Statistics Finland is also responsible for the development of environmental economic accounting.

The state of the environment and natural resources and their impacts on human beings are research subjects of natural sciences and are monitored by research institutes like the Finnish Environment Institute (SYKE), the Forest Research Institute (Metla), MTT Agrifood Research, the Finnish Meteorological Institute and the Geological Survey of Finland.

Greenhouse gas inventory

Finland and the European Union are both parties to the UN Framework Convention on Climate Change, UNFCCC and to the Kyoto Protocol, which completes it. The Kyoto Protocol requires that parties have a national assessment system for the estimation of greenhouse gas emissions and sinks, reporting, quality management, archiving and for annual reviews, which are carried out by international expert review teams.

In the Finnish national system Statistics Finland is the national authority for the greenhouse gas inventory. Statistics Finland compiles the Finnish inventory and submits it to the secretary of the UNFCCC and to the European Commission. Statistics Finland also has an important role in the calculation of the emissions, because it calculates the emissions of the energy sector and industrial processes. Expert institutes are a crucial part of the national system. They are responsible for the estimation of their own sectors in the system. Many of the research institutes already mentioned earlier are also co-operators of Statistics Finland in the greenhouse gas inventory.

Energy Statistics

The energy statistics system of Finland was born in the Ministry of Trade and Industry in the 1970's after the oil crisis. The system of statistics was and still is mostly based on data collection by the branch organisations of the energy sector. Energy statistics have been centralised into Statistics Finland since the early 1990's. During recent years the focus of the statistics has moved from the production of electricity and heat towards the use of final energy and environmental effects of the energy sector. The new EU energy statistics regulation will mean further efforts to improve the statistics on consumption of energy.

Energy statistics have a close link to the greenhouse gas inventory and in future also to environmental economic accounts. Energy accounts are contained in the plan of the European strategy for environmental accounts and will be included in the regulation on environmental economic accounts in the wave of the new legislation in the mid 2010's.

Other statistics

Many other fields of statistics are closely related to the environment, such as agriculture, forestry, fishery and games statistics. In Finland they are also involved in the YLE working group on improving the effectiveness of the national statistical service in Finland. However, the main resources in these fields of statistics are at the moment devoted to economic statistics, and these fields of statistics are not analysed in this paper.

4. Resources of statistics

The government uses for environmental and energy statistics and the greenhouse gas inventory in total about 64 staff-years, which contains the work of about 280 researchers and the like working only partly with statistics and reporting. The number of full-time statisticians is only 27.

The share of full-time employees in environmental statistics is lowest in the greenhouse gas (GHG) inventory, which has 11 full-timers and the total workload is 14 staff-years. The estimate of the resources is based on a survey implemented by the YLE working group in 2009.

Table 2. An estimate of the resources used for environmental and energy statistics and the greenhouse gas inventory in Finland in 2009

	Staff-years	Persons participating	Full-time employees
Environmental statistics and reporting			
Forest Research Institute			
- Forest Health Monitoring	18	90	0
- Forest Resources Inventory	5	..	..
Finnish Environment Institute	7	65	3
Statistics Finland	6.6	8	8
Finnish Meteorological Institute	1	5	0
Others	1.3	44	0
Total	**38.9**	**212**	**11**
Energy statistics and reporting			
Statistics Finland	5.5	6.5	4.5
Energy Market Authority	5	22	0
Forest Research Institute	1	2	0
Tike (Agricultural statistics)	0.4	6	0
Total	**11.9**	**36.5**	**4.5**
Greenhouse Gas Inventory			
Statistics Finland	7	7	7
Forest Research Institute	4	15	2
MTT Agrifood	1.5	3	2
Finnish Environment Institute	1.25	4	0
Others	0.4	3	0
Total	**14.15**	**32**	**11**
Total sum	**64.95**	**280.5**	**26.5**

5. Future challenges for environment statistics

Future challenges for environmental statistics, energy statistics and the greenhouse gas inventory are huge and will mean a need to increase the resources substantially. This is a difficult task in a situation when the government budget is cut and it is also necessary to reduce the resources of statistics in general.

For energy statistics and the GHG inventory the new obligations come from the international climate policy and the climate and energy policies of the European Union. The EU energy policy contains targets for decreasing the GHG emissions, targets for the share of renewable energy sources and targets for energy saving. The fulfilling of these targets will be followed by statistics, which will be reported to the EU. The GHG inventory has its own reporting rules, which are becoming more and more detailed year after year.

The EU energy statistics regulation came into force in 2009, and it requires that more efforts must be put on the statistics on final consumption of energy. The EU regulation on environmental economic accounting will be finalised soon. It means that more resources are needed also for environmental statistics.

There are many environmental policy programmes and programmes for sustainable development that demand more statistical information. In addition, increasing interest in improving the measurement of social progress and welfare will put pressure on the development of environmental statistics.

6. Summary and conclusions

Of the three main statistical systems the borders of environmental statistics are much less clearly defined than those of other economic statistics and social statistics. Important issues for further discussion are:

- The distinction between statistical information and research and monitoring information.
- The relation of energy statistics and the greenhouse gas inventory to the system of environmental statistics.
- How to make more benefit of the monitoring, research and administrative data in compilation of statistics.

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