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Forty-eighth plenary session

(Paris, 13-15 June 2000)

REPORT OF THE WORK SESSION ON METHODOLOGICAL ISSUES OF ENVIRONMENT STATISTICS

Note prepared by the secretariat

1. The Work Session on Methodological Issues of Environment Statistics was held in Ma'ale Hachamisha, Israel from 11 to 14 October 1999, at the invitation of Israeli Central Bureau of Statistics, who hosted the meeting together with the Ministry of Environment and with the support of the Ministry of Health, Ministry of Science, Ministry of Foreign Affairs and the Municipality of Jerusalem. It was attended by representatives from Austria, Finland, France, Germany, Hungary, Israel, Italy, Netherlands, Norway, Poland, Republic of Moldova, Sweden, United Kingdom and the United States.
2. Australia and the Palestinian Authority participated under Article 11 of the terms of reference of the ECE.
3. Also in attendance were the Food and Agriculture Organization (FAO) and the Blue Plan/Med Action Plan/UNEP.
4. The meeting was opened by the Government Statistician, Prof. Joseph Yahav, by Ms. Miriam Haran from the Ministry of Environment and by Mr. Yitzhak Lior from the Ministry of Foreign Affairs. They welcomed the participants and stressed the importance of exchanging information across nations, especially in the field of environment information and statistics, to arrive at a thorough understanding of how to achieve sustainability in the next millennium. They wished the meeting success in its work which they hoped would

be characterised by fruitful discussion and exchange. A keynote address was delivered to the meeting by Dr. Alex Leventhal, from the Ministry of Health, who spoke on Health and Environment (Health GIS).

5. Ruth Sheshinski (Israel) chaired the meeting.

6. The following substantive topics were discussed at the Work Session:

- Utilisation of economic and other statistics for environmental purposes
- Basic statistics, accounting, indicators: statistical support for the policy decision process towards sustainable development
- Land use statistics as a basis for derived environment statistics (collection, production, presentation, etc.)
- Statistics on water supply, distribution and quality
- Small area statistics and regional environment statistics

7. The topics were discussed on the basis of 19 Working Papers prepared by Australia, Austria, France, Germany, Israel, Jordan, Netherlands, Norway, Poland, United Kingdom, United States, Eurostat and FAO. Additional written material submitted by Kazakhstan, the Republic of Moldova and OECD served as a supplementary basis for discussion.

8. The meeting noted the many problems associated with existing land use/land cover classifications and regretted the lack of a standard international classification, which makes it impossible to compile an inventory of land use in member countries for supporting policy decisions. The participants suggested that this be called to the attention of the Conference of European Statisticians so that it could give support to FAO and work together with concerned organisations to improve this situation.

9. The participants thanked the authors for their excellent contributions and the session organisers for having prepared very interesting sessions.

10. In connection with discussing future work the meeting also reviewed its work methods and concluded that the use of session organisers had been successful. However, the meeting also felt that a format with Panel presentations and roundtable discussion would be suitable for one or two topics. It was therefore decided that for the next meeting the secretariat would try to use both session organisers and the Panel format according to topics and volunteers to perform these roles.

11. Concerning the topics to be discussed at future meetings, the group recommended that another meeting take place in 2001/2002 to discuss the following topics:

- Developing of air, water, land use and waste statistics according to the NACE/ISIC classifications and their uses.
- Environmental statistics (basic data, indicators, etc) as a basis for national, regional and local decision-making. What data and methods are suitable and feasible at different geographical levels?

- Country experiences in linking environment information to different economic sectors, e.g. transport, energy, agriculture, fisheries, industry and tourism.
- Urban environment indicators (e.g. land use change, noise, air pollution, human health, cultural heritage, etc.)
- Use of estimation methods and indirect measurements to provide environmental information for areas where data are lacking.

12. For any meeting which took place after 2001, the work session proposed the five topics listed below, but these would need to be reviewed by the 2001 meeting:

- Impact of the revision of the System of integrated Environmental and Economic Accounts (SEEA) on statistical systems in different national contexts (what data are lacking, how to implement it, how to achieve consistency, etc).
- Experiences from the process of including environment statistics in censuses (e.g. applications, policy uses, best practice, presentation and analysis of results
- Statistics on the environmental impact on human health
- Sustainable tourism
- Natural resources: change in quantity and quality; economic and environmental aspects

13. The participants were unanimous in their appreciation of the excellent organisation of the meeting, the social activities and the excursions offered by the Israeli hosts.

14. The main conclusions reached by the meeting will be presented in summary form in the Annex to this note (in English only).

15. The participants adopted the report of the meeting at its closing session.

**Annex**

**Summary of the main points discussed at the Work Session on Methodological  
Issues of Environment Statistics**

I. Utilisation of economic and other statistics for environmental purposes (Session organizer and Rapporteur - Julie Hass)

Documentation: Working Papers Nos. 11, 14, 15 and 18

1. The focus of this session was the use of existing data for environment statistics. Common themes that emerged from the presentations and discussions included both the advantages and the limitations to this approach. A major problem discussed focused on the differing definitions for variables between the data that is collected for another main purpose and the definition needed for environment statistics. Another theme common to the discussions was approaches to how to fill in the gaps needed to use existing data for environmental purposes. It was generally agreed by all authors that it was usually less expensive to conduct limited, focused surveys based on the existing administrative registers or surveys than to develop totally new environmental surveys. Other difficulties such as differing data about the same entity in different data registers, not having a representative sample and comparability to other countries were also discussed.

2. In the first presentation, the Financial Accounting Data Network (FADN) in the Netherlands was described and shown that some of the information obtained from that database could be used as a source of environmental data. Detailed analyses of farmer's invoices and accounting information is obtained and entered into the FADN database. From this information quantities and costs of, for example, pesticides and fertilisers can be identified. But it was pointed out that how much and when these chemicals were applied to fields is not given. Another concern was that participation in the FADN in the Netherlands was voluntary and not from a representative sample. There was concern that this could produce bias in the data.

3. The second area to be discussed was environmental protection expenditures (EPE). There were two presentations in this area. The first presentation was given by Israel and focused on the use of administrative registers for identifying companies that have environmental protection investments. Information from two registers were identified as providing some of the necessary information for estimating industry EPE but this needed to be supplemented with a focused survey to the companies. A main key was finding links between the various databases that enabled this information to be used. Using this approach did require that assumptions regarding the data needed to be checked along the way and the problem of differing information about and entity in the various databases was also encountered.

4. Australian Bureau of Statistics (ABS) gave the second EPE paper. ABS has initiated several new and revised surveys to both industry and local government to try to obtain information that can be used for calculating environmental protection expenditure according to the SERIEE definitions

and approach. They were not able to identify existing data sources for everything so it has been necessary to develop new survey instruments and routines. The Australian EPE data according to SERIEE are almost complete and the next step will be to link the expenditure data to other data.

5. The final paper was presented by Israel and focused on the use of real estate data for a cost/benefit analysis for noise reduction. There were small differences identified in the price of private dwellings (apartments and single family houses) in the same neighbourhood depending on whether the house faced a major street or not. It was assumed that this price difference was due to noise. This price difference was then used to estimate the per meter cost of the noise reduction. It was particularly interesting to know that this analysis was used in establishing the new Israeli regulation for noise. In the discussion, it was pointed out that the price difference did not only include noise but also air pollution, dust and other factors.

II. Basic statistics, accounting, indicators: statistical support for the policy decision process towards sustainable development

Documentation: Working Papers Nos. 6, 7, 9 and 16

6. The German participant outlined a method they had used of combining the physical energy input-output labels with monetary Input-Output tables to give an estimation of both the direct and indirect energy required by a homogenous branch, and contained in the product groups for final consumption by households. Although the estimations are based on monetary data, this should not introduce large errors into the estimates as the product groups are homogenous. This work has several uses including to assess the impact of an energy tax on the final consumer.

7. The French Institute of the Environment (IFEN) presented some results from their surveys on environmental awareness and practices of households. The surveys had been incorporated, into existing surveys on living conditions etc. The response to the 1998 survey uncovered a need for more information/awareness raising in the public, perhaps targeted at specific social groups. The meeting discussed the response rate to the survey, which had been 100 per cent because of face-to-face interviews were used to collect the information, and whether the persons interviewed would have given different replies if another data collection method had been used.

8. Three papers presented current work on environmental indicators. Eurostat's representative presented their Pressure Indicators project which looks at the main pressures from human activities in 10 main policy fields. This project has brought to light some serious data gaps, in particular, for priority areas such as land use and chemical use. There was some discussion on the feasibility of producing highly aggregated indices from these indicators, though it was felt that there is a need for such overall indices.

9. The participant from the UK told the meeting that her country has adopted a practical approach to preparing sustainable Development indicators. Sustainability is based on a balance of social, economic and environmental objectives, including wise use of resources. The difficulties in producing a single indicator for air pollution and the

pragmatic approach adopted to resolve these difficulties were explained.

10. Eurostat's representative also briefed the meeting of a new procedure currently underway to produce EU indicators to monitor how the different economic sectors are integrating environmental concerns into their policy work.

11. Throughout the discussion in this session the importance of robust, simple and transparent indicators was emphasised.

III. Land use statistics, as a basis for derived environment statistics  
(Session organizer and Rapporteur - Pratap Narain)

Documentation: Working Papers Nos 5, 12 and 13

12. The three papers prepared for the session were more or less independent and dealt with either type of statistics in its own perspective. The FAO representative explained that "land use related statistics" include land use statistics, which are a description of land in terms of its function and actual purposes of its use, and land cover statistics which are based on the observed bio-physical cover of the earth's surface.

13. The first paper discussed was prepared by the French Institute for Environment (IFEN) and presents a technique for smoothing land cover data. The technique was explained to the meeting and an example shown where it had been applied to the French Land Cover data, which have been compiled using the Corine Land Cover Nomenclature.

14. The second paper presented by Statistics Norway uses Geographical Information System (GIS) technology to define land use and land cover and to delimit urban settlements. The project on urban settlements delimitation makes use of existing databases of administrative registers, supplemented by data collected in a few surveys. Both techniques were found useful and interesting for deriving land use related statistics for environment uses. Statistics Norway is also working on a project that attempts to link land use statistics with economic activities classified according to the NACE nomenclature.

15. The Session Organiser presented himself the third paper which details the experience of the FAO Statistics Division in producing internationally comparable series of land use statistics using the data collected from various countries and contained in various publications. Having heard about the many difficulties in obtaining comparable data, the meeting discussed the need for developing guidelines for compiling internationally comparable time series of land use statistics which could be used for deriving environmental indicators and statistics. Land is one natural resource that is at the centre of all economic activities. Land inventories, skilfully classified according to various economic uses are important databases for governments, planners and policy makers. At the national level these databases are being produced and reflect local needs but no classification is available at the international level which could serve agricultural and environmental decision making.

16. The meeting was also told that the FAO approach has been to support

efforts to develop land use and land cover classifications separately, while encouraging co-operation between the two.

IV. Statistics on water supply, distribution and quality

Documentation: Working Papers Nos. 3, 4, 10 and 17

17. The representative from the U.S. National Agricultural Statistics Service (NASS) told the meeting about the 1998 Farm and Ranch Irrigation Survey (FRIS) which his service had conducted last year. The survey is a follow-up sample survey to the 1997 Census of Agriculture and provides detailed information on irrigation practices in all 50 States of America. The 12 page questionnaire includes questions about irrigated acreage by land use, quantity of water applied and methods of application to selected crops, acres irrigated by type of water distribution systems, the number of wells and pumps, expenditure on irrigation and energy sources used in water management.

18. The 1998 survey was the fifth one but as the official results will only be published later in the year the data presented to the meeting were from earlier surveys. The main purpose of the FRIS is to provide data on irrigation activities that can be used in preparing water-related programs, economic models, legislative initiatives, market analyses and other studies. In the United States, agricultural irrigation accounts for two-thirds of all ground water withdrawals and more than 80 per cent of all water consumption.

19. The meeting discussed the survey design of the questionnaire, the response rate and the way the survey was conducted (mail) as well as the time needed to fill in replies (45 minutes). The participants also had a number of questions relating to the different irrigation methods and their adaptation to different crops. The most environmentally efficient method, the drip method, they were told, could only be used for some fruit and vegetable crops.

20. The impact of sinking bores and pumping from ground water and streams was also discussed. In United States the local authorities have to give permission and farmers pay a levy according to pumping capacity. Wells located on farms is the largest irrigation source and in 1994 constituted 49 per cent of all water pumped for irrigation purposes.

21. The Polish representative briefed the meeting on the many annual surveys the CSO conducts on water and waste water management which are available by 16 regions. Surface water resources cover 80 per cent of the country's water needs. Underground water is mainly used for drinking and cannot be used for industrial purposes. Among the industrial users, the electricity sector alone accounted for 86 per cent of all water used by the industry sector. The main problem of the Polish water sector was to meet the EU requirements for urban waste water treatment, for instance, in Warsaw only 46 per cent of the municipal waste waters are treated.

22. The Australian participant described their efforts to compile physical information on the supply and use of water. The data had been obtained from a vast number of sources and integrated into a framework compatible with economic data sets and a set of Assets tables and Water Balance tables had also been prepared. The reason they had developed a Water Account was to link it to the country's National Accounts and other

natural resource data sets. Due to unavailability of data they had only managed to construct the Water Assets table for one State (Victoria). The meeting discussed the difficulty in getting comprehensive data on emissions to water sources, in most countries emissions are only assessed by point measuring. As the supply and use tables will be completed for each State, the next step would be to link the physical information with monetary data compiled so that coefficients and indicators can be compiled to better reflect the economic structure of water demand.

V. Small area statistics and regional environment statistics

Documentation: Working Papers Nos. 2 and 8

23. A participant from Israel presented a paper on statistical methods for the detection and investigation of clustering of rare events or diseases, for example cancer. Due to the small number of cases, statistical methods normally used in epidemiology which are based on the number of cases in a time interval, cannot be used. Therefore, a specific methodology has been designed, based on the time interval between the events, expressed in terms of standardised time units. This methodology can distinguish whether the cluster is an incidental rare event or whether it is related either to an exposure to pollution or to another cause, such as the introduction of a new medical device that enables earlier diagnosis.

24. The Austrian representative in his presentation described how the Austrian Central Statistical Office used the data of the Combined Census (which include information on population, housing and non-agricultural units of employment) to produce information on issues relating to the environment.

25. The lowest level of territorial detail for census information is usually the enumeration area, but for environmental enquiries this breakdown is insufficient. Therefore, a special evaluation method based on the smallest statistical survey unit, the building, was used for the 1981 and 1991 censuses. For specific purposes statistical data are also available on the basis of grid squares, after the breakdown of the territory into unites of the same size.

26. By year 2003, ÖSTAT plans to have finalised the recording the co-ordinates of every building, which will enable statistical analysis to be carried out for small areas on a regular basis.