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**Intersecretariat Working Group on Environment Statistics
Work Session on Water Statistics
(Vienna, 20-22 June 2005)**

REPORT OF THE INTERNATIONAL WORK SESSION ON WATER STATISTICS

Note prepared by the secretariat

1. The Intersecretariat Working Group on Environment Statistics (IWG-ENV¹), together with the UN Food and Agriculture Organization (FAO) and the UNEP GEMS/Water programme held an International Work Session on Water Statistics in Vienna (Austria) from 20-22 June 2005 at the invitation of the Austrian Environment Agency (UBA).
2. The Work Session was attended by representatives from Austria, Argentina, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, Dominican Republic, Estonia, France, Germany, India, Jordan, Moldova, Morocco, Netherlands, Norway, Poland, Romania, Slovenia, South Africa, Spain, Sweden, Tanzania, Turkey, Uganda, Yemen, and by representatives of the Global Runoff Data Centre, the Mekong River Commission, the UN Division for Sustainable Development, the UN Economic and Social Commission for Western Asia (ESCWA), and World Water Assessment Programme (WWAP) as well as members of the European Topic Centre for Water, ICstat and IPALMO.
3. The meeting was opened by Mr Georg Rebernik, the Managing Director of UBA, who welcomed participants to Vienna and UBA. Mr Rebernik reminded the meeting of the importance of water statistics in the context of the Millenium Development Goal to reduce by half the proportion of people without sustainable access to safe drinking water. As a member of the European Topic Centre for Water involved in developing the Water Information System for Europe (WISE) and for Austria, UBA has a wide experience in water statistics and is particularly happy to host and participate in this important meeting.
4. Mr Peter Hackl also welcomed participants on behalf of Statistik Austria. Mr Hackl spoke of Austria's abundant and good quality water resources, but also of the threats to

¹ The current members of the IWG-ENV are the United Nations Statistics Division (UNSD), the United Nations Environment Programme (UNEP), the Organisation for Economic Co-operation and Development (OECD), the Statistical Office of the European Communities (Eurostat), and the United Nations Economic Commission for Europe (UN-ECE).

those resources, particularly from agricultural pollutants. Statistik Austria and UBA work together closely to monitor the state of and pressures on these resources. Austria is one of seventeen countries in the Danube catchment area, and recognises the importance of internationally comparable data for cooperation on water related issues.

5. Mr Helmut Fleckseder welcomed the participants on behalf of the Minister of Agriculture, Forestry, Environment and Water Management. Mr Fleckseder spoke of Austria's pride in the quality of their water and their surprise at discovering Austria was ranked only 18th in a world-wide comparison. The statistical basis for this ranking was never clear, illustrating the need for as much harmonisation and unification of reporting requirements as possible, so that assessments are made from a comparable basis.

6. On behalf of Mr Paul Cheung, Director of UNSD, Mr Ulrich Wieland thanked UBA for hosting the Work Session. He outlined the objectives of the meeting, and reminded participants that water statistics and accounting are priority areas of the UNSD work programme. A manual is currently being developed to support and guide countries in their efforts to set up water data collection, and a handbook on Integrated Environmental and Economic Accounting for Water Resources is near to completion. UNSD has launched a major initiative to promote and further develop the implementation of water accounting which is a powerful tool to support Integrated Water Resource Management.

7. Mr Christian Averous, Head of OECD's Environmental Performance and Information Division, spoke of the OECD's environmental performance reviews which show that many countries have been successful in some areas of water management, but often efforts have not been enough to safeguard water quality and aquatic ecosystems. The main policy challenges include investments in the water sector, taking into account the implications for water resources when developing sectoral policies, and getting the prices right. There is also the "governance challenge", particularly, but not only, in developing countries. These policy concerns create a need for institutional and financial arrangements for data production in order to meet demand for and access to quality, timely, and reliable water statistics.

8. The Work Session was organised in nine sessions, each focusing on a different aspect of water statistics, and chaired by different persons:

- Session 1: The need for water statistics: information for water policies
(*Organiser: R. Montgomery, UNSD; Chair: Ingeborg Fiala, Austrian Ministry of Agriculture, Forestry, Environment & Water Management*)
- Session 2a: Water statistics collected by international organizations
(*Organiser: R. Montgomery, UNSD; Chair: Rainer Muthmann, Eurostat; Discussant: Rudy Vannevel, Flemish Environment Agency*)
- Session 2b: Water accounting: challenges and opportunities – panel discussion
(*Organiser: A. Alfieri, UNSD; Chair: Christian Averous, OECD*)
- Session 3A: Information on water resources
(*Organiser: K. Frenken, FAO; Chair: Thomas Maurer, GDRC; Discussant: Raymond Mngodo, Tanzania*)
- Session 3B: Information on waste water generation and treatment
(*Organised and chaired by Jürgen Förster, Eurostat; Discussant: Prof. Maria Fürhacker*)

- Session 4A: Information on water supply and use
(Organised and chaired by Rosemary Montgomery, UNSD; Discussant: Wafa AboulHosn, ESCWA)
- Session 4B: Information on emission of pollutants to ambient waters
(Organiser: J-A Hanauer, Eurostat; Chair: Ulrich Wieland, UNSD; Discussant: Bruno Kestemont, Belgium)
- Session 5A: Information on water quality
(Organiser: S. Barker, GEMS/Water; Chair: Richard Robarts, GEMS/Water)
- Session 5B: Information needed for water pricing and expenditure on water
(Organised and chaired by Myriam Linster, OECD)

9. The topics were discussed on the basis of 35 working papers prepared by Argentina, Austria, Belarus, Belgium, Brazil, Canada, Chile, Croatia, Estonia, France, Germany, India, Jordan, Moldova, Netherlands, Slovenia, South Africa, Tanzania, Yemen, ICstat, IPALMO, the Mekong River Commission, ESCWA, the European Topic Centre for Water, Eurostat, FAO, GEMS/Water, UNDSO, UNSD and WWAP.

10. A summary of the nine sessions and their conclusions is attached in Annex A. All papers submitted for the Work Session may be downloaded from the UN Statistics Division website at: <http://unstats.un.org/unsd/environment/waterstatwksess.htm>

11. A consistent theme throughout the meeting was that reliable, consistent water data and policy relevant indicators are a fundamental prerequisite for the proper evaluation and water planning in many areas, including sustainable development, the Millennium Development Goals, and for countries own water management, which should drive data collection priorities within countries. However, if water data is collected at all, it is often done in an unstructured manner, by many different agencies within a country, with little co-ordination between them. Several countries have successful models of cooperation between many agencies, resulting in improved quality and accessibility of water data.

12. The meeting concluded that:

- a) water statistics are a basic element of environmental information and cover the fields of water resources, supply, use, emissions, treatment, quality and economic aspects. Currently the availability, quality and accessibility of data typically do not meet the demand at either national or international level;
- b) because of the diverse and often complex nature of water data, many specialist bodies are involved in its collection, interpretation, reporting and use within countries. Data providers and other stakeholders, e.g. policy-makers and other data users, need to be brought together within integrated networks of experts, to work together to identify and collect the most needed data within a coherent framework, and to make optimum use of the data currently collected ;
- c) statistical services have a particular role, especially, but not only, concerning the collection of water use data. Capacity building for the collection of basic water statistics is required in many countries, some of which do not have statistical units dedicated to water or environment statistics ;
- d) water accounts provide a coherent framework for diverse water data and can be a powerful tool to support integrated water resource management. The

implementation of water accounts requires coordination among various agencies involved in the production of water data. The benefits of such accounts for organizing information from different sources should be promoted. Countries that are interested in developing water accounts need to be trained and supported financially and technically ;

- e) regional and international organisations actively collecting water data need to work more closely with each other and with UN Water to improve data availability and harmonization and to eliminate duplication. Responsibilities need to be clearly defined, so that data needs to be sent only once to international organisations;
- f) there is a need to improve access to, and interpretation and, ultimately, use of data from its disparate and distributed sources, by applying standardized metadata ;
- g) there is a need to provide and promote use of standardized methodologies to be used to aggregate raw data to statistics and to indicators ;
- h) within countries there is often a lack of awareness of why international organizations collect water data, and feedback should be given to data providers on how data is used and the benefits of this use internally and externally.

13. The meeting invited countries to:

- share experiences on the development and use of water statistics, to identify common challenges and possible solutions ;
- create Environment Statistics units or similar structures to undertake the systematic compilation of water statistics ;
- create appropriate structures/networks to bring together water data providers and other stakeholders, to ensure that the most needed data is collected and that optimum use is made of the data currently collected.

14. The meeting recommended the IWG-ENV to:

- a. set up a subgroup to address the issues e) to h) above, and to coordinate the work of international organisations on water statistics ;
- b. provide appropriate manuals and methodologies to assist countries in collecting water statistics. This should be co-ordinated with UN regional offices ;
- c. facilitate the actions under point 12 above, and explore other possibilities to assist countries in the continuous improvement of data quality.

15. The delegates were unanimous in their appreciation of the excellent organisation of the meeting, and the social activities offered by the Austrian hosts. The IWG-ENV, FAO and GEMS/Water would like to thank UBA for their excellent assistance in the preparation of the meeting and the organisation of facilities during the meeting; they would also like to thank UBA, Statistics Austria and the Austrian Ministry of Agriculture, Forestry, Environment and Water for their contributions to the Work Session and for their hospitality.

16. The meeting also thanked session organizers, discussants and authors of papers for their excellent work.

17. The meeting adopted the report of the meeting at its closing session.

Annex A: Conclusions of the sessions

Session 1: The need for water statistics: information for water policies

Session 1 had five presentations on monitoring initiatives, specific reports and reporting obligations: initiatives to improve existing monitoring systems, reports on the environment as a whole and on water issues only, but focusing on the relation between water issues and sectoral policies such as agriculture, health and ecosystem functions. All the presentations highlighted that the monitoring initiatives support water policies.

UNEP's Global Environmental Outlook (GEO), its objectives and data needs, were presented by Richard Robarts. GEO is intended to provide a comprehensive, scientifically-credible, policy-relevant, up-to-date assessment of, and outlook for, the state of the global environment. It analyzes environmental conditions, trends and emerging issues, pressures and driving forces, primary and secondary effects, environmental values and costs to society, and policy response options and their future implications. Assessments are made at global and sub-global levels. For GEO-4 data gaps for some themes are anticipated, for example, in many cases, water quality data is available only to 1990.

Takeo Jimbow, Secretariat of World Water Assessment Programme (WWAP), presented the indicators to be developed by WWAP UN partners for the Second World Water Development Report, along with the WWAP challenge areas for describing the state of freshwater resources at global level. Water indicator development is one of the key activities in the WWAP Phase 2 and WWAP UN partners are keen to develop indicators. These go beyond the indicators used in WWDR-1, and will require more and better data if they are to be operational.

To help countries manage their water sector, including water resources, Jean-Michel Chéné presented options for developing national integrated water information systems, with reference to Agenda 21 and the work of the Commission on Sustainable Development. These recommendations include using a modular architecture to provide sector analysis on on water governance, water resources, equity in access, water infrastructure and service performance, and sustainability. This approach requires a set of common coherent definitions and frameworks, to be used by countries to assess their own progress towards sustainable and equitable development of their water assets.

Anne Gendebien gave an overview of the "Water Information System for Europe" (WISE). This based on the reporting obligations resulting from the EU Water Framework Directive. WISE will support the co-operation between EU bodies and Member States by combining tools such as GIS and will act as a common portal for (public) information. Thus it requires clear definitions and standardisation. It is planned that WISE will also integrate other water databases, such as UWWT, flooding, EIONET Water, and INSPIRE and will build a link to cross-cutting issues such as biodiversity and health.

Umberto Triulzi talked about monitoring/reporting on the performance of the EU Water Initiative, i.e. its aid to developing countries directed at water projects. He described the necessary phases to support capacity building for monitoring at a country level, establishing some guiding principles for monitoring within normal project management and implementation. Three criteria to check the value added of applying the EU Water Initiative and its objectives were derived and are assessed.

Though the aim of all these initiatives varies, there are some common criteria which should be fulfilled, in order to make the monitoring effective.

The following conclusions can be drawn:

- Monitoring trends in a country's water situation is a prerequisite to identify changes, relations and the efficiency of policy and other measures. It is thus the basis for a target-oriented policy.
- In order to support clarity of information, a structure (methodological framework) is needed. The selection of indicators should ensure that important information and functions are made visible, which also help to monitor connections, interactions and effects.
- A monitoring system is not just collecting data, but comprises data exchange and the merging of information, including also GIS as an important element.
- The reports based on indicators serve different purposes and are therefore oriented differently with regard to space (global – national), subject (environment – sector-specific, media-specific), and the period observed (review – forecast).
- In this context certain criteria gain special significance.
 - The comparability of data is particularly important for supra-regional or global reports.
 - If rankings are made, it is an indispensable prerequisite.
 - Important preconditions are the disclosure and, whenever possible, the standardisation of definitions and methodologies.
 - Moreover the freshness of the data is important, in particular for reports which serve as a forecast.
- In order to achieve the greatest possible efficiency one should aim at harmonising the information systems for the different purposes and organisations. In this way the expenditure in terms of time and money can be reduced and unambiguous statements can be achieved.

Session 2a: Water statistics collected by international organizations

Session 2a looked at the different data collected by the international organisations from countries. Ulrich Wieland highlighted the large degree of consistency between the OECD/Eurostat and the UNSD/UNEP questionnaires, while Alessandra Alfieri discussed the similarities and differences in terminology and boundaries between these and the Water Accounts tables. She stressed the need for consistency in the data provided, and the role of water balances in providing a check for consistency.

The focus of the FAO Aquastat system, presented by Karen Frenken, is on whether there is enough water to grow the food needed to feed the world, and therefore on water resources and irrigation. Data is acquired partly by questionnaire, but also through expert information, literature search, modelling and feedback from countries, to give the best possible estimate of water resources and irrigation. Important factors are the use of water balances, data aggregation on river basin scale and the need for harmonisation of definitions.

The GEMS/Water system was presented by Richard Robarts. The data covers water quality and any related information. Therefore all data are geo-referenced and have a method code, to track changes in methods overtime. All data submission is voluntary, with the result that data for countries are not always up to date. GEMS/Water is producing software for countries to submit data easily, and to encourage countries to use this data submission tool, it will include other packages that will be useful for the countries themselves.

Wafa Aboul Hosn of ESCWA outlined some of the data problems and the special water conditions in the West Asia region, which include regular use of non-conventional sources of water such as agriculture drainage and desalination. A questionnaire in Arabic has been designed to help address some of the problems encountered in international questionnaires, and is currently being tested.

Rudy Vannevel gave a country perspective on reporting to international organisations. He spoke of the disadvantages of the current unharmonised data collection, and highlighted the advantages of harmonisation at every stage of the data acquisition process – monitoring, questionnaires, databases, reporting formats, timing. In an ideal situation, there would be one set of data, one questionnaire and a common reporting mechanism, whereby all international organisations received the same data. This would be facilitated by a single application/data warehouse for all reporting obligations/requests.

Session 2b: Water accounting: challenges and opportunities

Alessandra Alfieri outlined the UNSD work programme and plans for environmental accounts. She explained how environmental accounts standards improve consistency between economic and environment statistics, encourage the development of comprehensive data sets, and facilitate international comparisons. For water resources, accounts provide a tool for integrated water resource management, describe the relationship between water resources and the economy, and facilitate the design of economic and water policies and the analysis of the impact of these policies. The different types of accounts were described, together with examples of indicators that can be derived from them.

Jana Tafi outlined the process of compiling water accounts in Moldova, and how they had provided a focus to bring together many different data holders to produce a single agreed, coherent and consistent set of water tables for use by all policy makers and analysts.

A panel discussion, involving also the Dominican Republic, Eurostat and OECD, followed. They reminded the audience that initially the full accounts tables do not need to be completed, but rather used as a structure for data, on which to base internal cooperation and to identify data gaps. Although this cooperation process may help bring out previously inaccessible data, accounts are not a substitute for basic data collection.

Session 3A: Information on water resources

A more detailed look at Aquastat revealed some of the systems finer points. Aquastat's focus is on country level data for renewable water resources, so stocks of ground or surface water are not included. They take the natural vs actual approach, and look not only at theoretically exploitable resources, but also at what is accessible. However, there are many data gaps and problems, and relying on country data alone does not ensure consistency between countries. Therefore a simple, GIS-based model uses available data to present a homogenous water balance across a continent.

Raymond Mngodo presented the Nile Basin Initiative, based on the shared vision of water resource management. Based on a data sharing protocol, the Nile Basin countries have been able to assemble together historical data into a single database in a bid to come up with a tool for multi objective water resources allocation decision-making.

The difficult water situation in Yemen was presented by Qahtan Al-Asbahi, where there is heavy pressure on limited groundwater resources. Most of the data collection and information systems remain scattered in various autonomous agencies dealing with resources/supply and sanitation/irrigation. A Water Resources Information Centre has been established to address these and water amangement problems.

Jana Tafi gave more details of Moldova's physical (quantities) accounts for water resources. The main strength of the accounts is that they bring together all providers of water data, to harmonise their data production to fit a single framework which is particularly useful for production of indicators and as input to economic models.

Ulf Hedlund presented the Mekong River Commission which provides another example of management of a shared water basin. The 1995 agreement covers cooperation in all fields of sustainable development, utilisation, management and conservation of water and related resources in the Lower Mekong basin. Hydro-meteorological data is the most important as flood forecasting is an important activity. The main limitations are a lack of skilled staff and insufficient funding.

In the discussions that followed, proposals to improve and streamline data acquisition included strengthening international data centres, making use of specialised agencies, such as IGRAC, and using regional bodies to tailor demands to regional specificities. The need for basic data as a fundamental prerequisite for better assessments should be put higher on the international agenda (resolution, conventions, GEOSS...) as setting up a

totally new data collection system is time and resource consuming, so needs to be justified and planned well in advance, with a focus on the most important data needs. It was felt that response rates would be improved if countries were made aware of what the data is used for, e.g. GEOSS societal benefits². The issues may be understood at higher level, but not necessarily on local level, but the opposite can also be the case. The UNSD should act as a facilitator together with UN-Water, not only coordinating data collection but also providing feedback and training to countries, and advising on transferring methodological information from international to national or local scale.

There is also room to promote statistics or accounts for the benefits they can bring to the country itself. Doing accounts is 20% statistics and 80% negotiation.

Conclusions

1. Both top-down and bottom up strategies should be followed

Top down include

- Establishing standards, e.g. encourage documentation of data by standardised metadata (ISO 19100 series)
- Developing and promoting methodologies

Bottom up approaches include capacity building at national and subnational level and strengthening the role of regional organizations and commissions.

2. Clearer communication on why is the data needed
3. Publish even provocative material as this triggers dialogue and improvements
4. Different approaches for different scales

Session 3B: Information on waste water generation and treatment

The presentations during this session fall into two categories: a) horizontal views from independent experts, and b) views and experiences from four different countries.

a) Michael Nagy (UBA) talked about the content and differences of the OECD/Eurostat and the UNSD questionnaires as regards wastewater, and Benoît Fribourg-Blanc (European Topic Centre for Water) explained the main technical obstacles to collecting good and comparable data on wastewater.

b) Country presentations from Birgit Hein (Germany), Danijela Sabic (Slovenia), Dharmo Rojas (Chile), and Rajendra Bhardwaj (India), not only covered different regions of the world, but also countries at different stages of development.

Conclusions:

- The **uses and objectives of the questionnaires** should be defined and stated clearly in order to provide guidance to the respondent.
- **Harmonisation and coordination** of wastewater statistics are required in different dimensions: At national level, national statistical institutes need to establish better cooperation with regions and with environmental administrations; at the international

² See http://www.epa.gov/GEOSS/fact_sheets/earthobservation.html

level, the active international organisations need to coordinate their activities and harmonise their questionnaires. In general, there is a need to focus on statistical strategies and methods, including data processing and validation. Examples of the need for harmonised definitions are the classifications of wastewater treatment plants according to their type (urban / independent) and treatment efficiency (primary - secondary - tertiary or mechanical - biological - advanced).

- **Data quality** is often unknown and should therefore be addressed; this should encompass questions of representativeness, metadata documentation and the discussion of different quality requirements for different statistical purposes.
- The further development of wastewater statistics should take into account **parameters that go beyond simple organic load (BOD/COD)**, primarily pathogens and toxic substances. Also, pollutants contained in suspended solids and sewage sludge should be considered.

Session 4A: Information on water supply and use

Jeremy Webb of UNSD presented the supply and use tables of the water questionnaire, and discussed some of the design principles behind the questionnaire. Belarus, Jordan and Brazil gave an overview of the supply, use and other water reporting issues in their countries.

Zhanna Vasilevskaya of Belarus described the Ministry of Natural Resources water cadastre and law obliging all legal entities to report on water use, from which a lot of data can be drawn. There are, however, problems getting good data from small businesses. Statistics in Belarus are collected by the Ministry of Statistics and Analysis, which allows some control of how data is used. Since the Chernobyl incident, Belarus has had to focus more on water quality and contamination.

The water scarcity and overexploitation in Jordan was outlined by Khamis Raddad. Administrative data on water exist but no disaggregation is possible and it is difficult to have access to the data. The 1999 census of enterprises allowed Jordan to construct a stratified sample survey of water use. The cost of collecting this data is high, and it is difficult to find people with the right set of skills to carry out such surveys and to process the replies.

Judicael Clevelario Junior gave a summary of the situation in Brazil, with three levels of government, federal, state and local, that collect water data - resulting in a significant overlap of activities. The extent of the activity varies: some states have more experience in water statistics and more funding for such work. All levels and agencies do not use the same methodologies and sometimes different things are measured. Data is not readily shared. Despite the number of agencies in water statistics, there are still gaps for example in groundwater for which there is little data. There is a clear need for different agencies to work together to compile, organise and synthesise existing data, fill the gaps especially for groundwater and irrigation. IBGE is trying to clarify its role in this area.

As part of an Italian-Romanian twinning project, ICStat worked with Romania to help them meet the environment statistics requirements for EU accession. From this project, Giorgio D'Amore drew some useful lessons that can be applied to other parts of the world. These include:

- The first step is to get buy in from all institutions and stakeholders – preferably by a formal protocol at a high level.
- Build on the existing pillars of the statistical system by adding very few simple relevant questions for environment statistics purposes, e.g. Industry surveys, Household surveys, Agriculture surveys.
- GIS has proved to be a very useful tool for analysis and development of environment statistics.

From this experience, a set of simple ideas were identified that could make a big contribution to water data in countries:

- Countries should conduct an exhaustive survey of ISIC 41 units (enterprises whose main activity is the collection, purification and distribution of water), because there is a relatively small number of these units in any country, and therefore this will be relatively cheap;
- IWG-ENV could conduct research on indirect coefficients of water use in industry, drinking water and irrigation that can be used to estimate water demand where other better statistics are not available;
- IWG-ENV should advise countries on what key questions can be added to existing surveys to collect high value data on water.

In the discussion that followed, the following points were identified:

1. Outside organisations can help establish the internal coordination that is needed within countries
2. Some countries need specific legislation in order to conduct surveys
3. The development of coefficients can be useful, but should only be used if nothing else is available
4. The importance of environment statistics can be boosted by a national sustainable development strategy
5. Surveys should be standardised within a framework of a programme, such as that developed for Lake Victoria.
6. By focusing on only the big users of water, surveys can be downsized while retaining a high level of coverage.
7. There is a need to clarify what is being asked for under “public supply” – ISIC 41
8. The water balance should be used as a basis for the questionnaire
9. Non-conventional sources of water, such as rainfall harvesting or desalination, are important in some parts of the world and are growing in importance elsewhere – thus should also be included
10. There is debate as to where cooling water and hydro electricity fit in relation to the survey – should they be included?
11. FAO and UNSD should work closely together on water supply and use statistics.

Session 4B: Information on emissions of pollutants to water

Emissions to water are an important ecological topic, but data is sparse, even in developed countries. The OECD/Eurostat questionnaire includes a detailed table on emissions, which has consistently had very low response rates. The water accounts framework also requires emission data.

The presentation by Dominique Preux (Office International de l'Eau) gave a summary of information sources on European level, such as EPER, the Urban Waste Water Directive or (in future) the Water Framework Directive, but indicates also the main data gaps, especially concerning emissions from diffuse sources and small enterprises. The Estonian presentation (Eda Grüner) showed the results of a pilot project where emission data on NACE 2-digit level was obtained through existing reported emission data and through an additional enterprise survey. The Dutch NAMWA system, presented by Sjoerd Schenau, integrates emission data and economic data in an emission accounts framework on river basin level.

In discussion that followed, it became clear that emission statistics are difficult to obtain, but that some useful basic data and models are available, especially in developed countries. For example, the EU and Canada have reporting obligations covering emissions from the most polluting industries, and methodologies to estimate emissions. It seems premature to include a table on emissions in a UNSD questionnaire for global data collection. Participants are invited to send relevant methodologies to UNSD who will make them available to a larger audience.

Session 5A: Information on water quality

The presentations in this session looked at harmonising data reporting (Rudy Vannevel, Belgium), global and national water quality and monitoring (Rajendra Bhardwaj, India; Wandile Nomqophu, South Africa; Oscar Natale, Argentina), groundwater quality (Andreas Scheidleder, Austria) and a new national approach to a Water quality index (Rob Kent, Canada).

From the national and regional perspective, the key points raised were:

1. The variety of parameters and problems among regions is large and has led to very different monitoring systems.
2. At all levels, the link between WQ monitoring and policy management needs is strong to weak, with often an institutional separation between the bodies carrying out the monitoring and the body making policy decisions.
3. Constraints to sustaining long-term monitoring are variable but significant – challenges in maintaining long-term funding support, breakdown of infrastructure, out-dated training, equipment, lack of software, etc.
4. Large countries have additional problems – variability of regional water quality issues and capacities, transportation of samples over long distances, costs, time delays, differences in seasonality and impacts on data – multiple organizations.

5. Transboundary waters – problems to design and implement monitoring.

These national level problems/concerns also impact at global level, where international organisations have little or no control over the monitoring activities and have no access to additional information. The question was raised whether a uniform UN-wide monitoring and reporting system on this subject is useful. Maybe the collection of more regionally and/ or subject oriented data is a better way. International organisations can provide a common strategy on monitoring, including a common view of the purpose of data collection on this issue, and do a number of other things that might help improve the response rate and the quality of the data :

- Explain to data providers why the information is needed and who is using the data.
- Harmonize data collection processes and increase standardization of methods.
- Provide countries with manuals and methodology guidelines to reduce problems of data quality and comparability.
- Package data for compelling stories – make data interesting and relevant.
- Provide opportunities for national and international benefits to collecting, sharing and using data for common purposes.

Other issues raised include:

- Groundwater vs. surface water – costs, reliability of state/trend analysis; wetlands are not usually covered.
- WQ monitoring needs to include sediment and suspended sediment quality.
- Biological monitoring: expand the use of biological measures of water quality as true integrators of physical and chemical attributes of water
- Organic pollution is a key issue in many countries, but requires simpler/cheaper ways of monitoring.
- community-based monitoring programmes – a growing reality that would benefit from more guidance, consistency and use
- To be truly useful, water quality data and statistics must be expressed in a societally-relevant and identifiable way, such as suitable for drinking, for swimming, for fishing, etc.
- Impact of new technology on: lowering costs, obtaining data from remote sites, enabling developing countries to do monitoring:
- Pressure to measure more for the sake of being able to do it: Avoid monitoring for the sake of monitoring alone; real policy needs and questions have to drive this expensive activity.
- Application of indicators and WQIs at regional and global scales – need to start a process looking at the use of indicators across multiple spatial scales (from watershed to global scale; the challenges of aggregating and disaggregating data and statistics.
- The impact of spatial and temporal data gaps on the scientific quality of reports, i.e. WWDR, GEO, MA, etc.

- Rather than collect data in all fields themselves, UNSD and others should make use of service programmes mandated to compile data in specific areas.

Session 5B: Information needed for water pricing & expenditure on water

This session focused on the economic side of water statistics, an area in which information is essential but seen as insufficient to effectively support decision making. Data that are most needed include information on water related expenditure and revenues in the private and public sectors, and water prices and tariffs for different types of consumer groups.

The presentations and discussions underlined the importance of such data to support economic analysis of integrated water management and related pricing policies. Getting the prices right is essential for (i) managing the water demand and achieving water conservation goals, (ii) securing the financial stability of water services and achieving economic efficiency goals, and (iii) increasingly also for achieving social equity goals. The example of a study carried out in the River Basin Artois Picardie (France), presented by Arnaud Courtecuisse, showed how the combination of information on water prices and on households' average income helps detecting affordability problems and their distribution in the basin, and how this can be used in the context of the implementation of the EU Water Framework Directive. It showed that in many municipalities the water bill exceeds 2% of the available income, a value as of which affordability can become a problem.

Economic data are generally less developed than physical data on water and only partially covered in international data collections. Expenditure data are collected from OECD countries via the OECD/Eurostat questionnaire, but are not covered in the UNSD/UNEP data collection. These data include expenditure on (i) wastewater management and prevention of emissions to surface water, and (ii) the protection and remediation of ground and surface water. Expenditure on water abstraction and supply is not included. Water prices are not covered in the OECD/Eurostat and the UNSD/UNEP questionnaires, but some data are available from the International Water Association (IWA).

- ◆ According to the results of the OECD/Eurostat data collection, presented by Joerg Hanauer (Eurostat) over 80% of EU countries report water expenditure data, the comparability being best for the business sectors: manufacturing, mining and quarrying, and electricity, gas and water supply. In future, Eurostat considers integrating expenditure data with related physical data as part of its environmental accounts and using these data in reporting to the EU Water Framework Directive.
- ◆ Eva Milota (Statistics Austria) presented the Austrian experience concerning water expenditure data and the OECD/Eurostat questionnaire. These data are derived from a wide range of sources, including Structural Business Statistics, sample business surveys, public accounts and budgets, business reports of environmental organizations, the environment industry, etc.. They cover all types of expenditure including expenditure on water supply that could easily be reported at international level.

The following data quality issues and areas for progress were discussed:

- ◆ Water expenditure:
 - The international harmonization of national water expenditure data needs to be further improved, in particular as regards the treatment of public and private specialized producers.
 - The coherence over time and the availability of longer time series are seen as essential to serve as a basis for projections and support decisions concerning future investments needs (e.g. in sewer networks or in waste water treatment facilities)
 - It was suggested that future developments should consider an expansion of the scope of water expenditure data collected at international level and cover water supply expenditure to complete the picture.
 - The possible inclusion of a few expenditure variables in the UNSD/UNEP version of the questionnaire was mentioned.
- ◆ Water prices and taxes:
 - It was underlined that transparency on costs, prices, subsidies, fees, etc, in the water sector is essential to monitor cross-subsidisation among consumer groups. In practice however many gaps remain. Information on water prices is best for households; less is available on prices paid by other consumer groups (industry, agriculture).
 - It was suggested that statistics on water prices and taxes should become part of the countries' official statistics, and cover all major user groups, taking into account the issue of confidentiality of some of these data.
 - The level and structure of water prices being strongly dependent on the local context and showing huge variations within a country, the provision of a more aggregate picture with a minimum of international comparability is not an easy task. The absence of an internationally agreed upon framework for compiling information on average water prices was mentioned, as well as the difficulty of defining an appropriate level of aggregation for national and international reporting.