DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

Expert Group Meeting on the Framework
for the Development of Environment Statistics
New York, 10-12 November 2009

REPORT

1. The Expert Group Meeting (EGM) on the Framework for the Development of Environment Statistics, organized by the United Nations Statistics Division (UNSD) in collaboration with Statistics Canada, was held in New York from 10 to 12 November 2009.

2. The meeting was attended by 29 experts from Australia, Austria, Belize, Brazil, Canada, China, Finland, Guinea, India, Italy, Malaysia, Mauritius, Mexico, Netherlands, Norway, Philippines, Singapore, United Arab Emirates, United States of America, the European Commission Joint Research Center, the European Environment Agency, the United Nations Children's Fund, the United Nations Environment Programme and the United Nations Division for Sustainable Development.

3. The meeting was opened by Dr. Paul Cheung, Director of UNSD. He noted that the need for a comprehensive framework for environment statistics that integrates all aspects of the environment and its links with the economy and the society had been voiced at several international statistical forums. The need for a reference framework was

also stressed with regard to statistics on cross cutting high level policy issues such as climate change. This request motivated UNSD to convene the EGM to review the UN Framework for the Development of Environment Statistics (FDES) and its two supporting methodological documents that had been published during the eighties and early nineties and discuss the feasibility to initiate a revision process that would develop the FDES into the much needed conceptual framework. He drew the attention of the meeting to the purposes the revised FDES should serve including the identification of a core set of environment statistics that the international statistical community recommends for countries to collect and compile.

4. The objectives of the Expert Group Meeting was to (i) discuss the role of a framework in the development of environment statistics; (ii) assess the lessons learned when applying different frameworks; (iii) review new approaches; (iv) subject the FDES to a review and (v) discuss the directions of the revision of the FDES and the modalities of the revision process. The conclusions and recommendations of the EGM will be submitted to the 41st session of the Statistical Commission in February 2010.

5. The EGM was organized in the following six sessions:

- Session 1: The need for a framework for environment statistics (Chair: Eszter Horvath, UNSD)
- Session 2: Overview of experiences with different frameworks for environment statistics and indicators (Chair: Edgar Ek, Belize)
- Session 3: The Canadian approach towards a framework based on ecosystems (Chair: Torstein Bye, Norway)
- Session 4: A review of the UN Framework for the Development of Environment Statistics (FDES) and its accompanying technical reports (Chair: Torstein Bye, Norway)
- Session 5: The way forward: Revision of the FDES based on national and international experience (Chair: Michael Nagy, Austria)

- Session 6: Conclusions (Chair: Eszter Horvath, UNSD)

6. The discussions were based on the following documentation:

- Framework for the Development of Environment Statistics (United Nations 1984)
- Concepts and Methods of Environment Statistics: Human Settlements Statistics (United Nations 1988)
- Concepts and Methods of Environment Statistics: Statistics of the Natural Environment (United Nations 1991)
- A Framework for Developing Environmental Statistics (Statistics Canada, 2009)

7. The topics were discussed on the basis of additional working papers and presentations prepared by experts from Canada, Norway, the European Environment Agency, Philippines, the European Commission, USA, Uganda, Guinea, Mauritius, Malaysia, Mexico and UNSD. All papers and presentations submitted for the EGM are available and may be downloaded from the UNSD website at: http://unstats.un.org/unsd/environment/fdes.htm

8. The conclusions and recommendations of the meeting (Session 6) are summarized in the following paragraphs 9-23. A summary of the presentations and discussions in the first five sessions is attached as Annex A. The agenda of the meeting is attached as Annex B. The list of participants is attached as Annex C.

Conclusions and recommendations of the Meeting

9. The Meeting agreed that an overarching conceptual framework is a necessary tool to define the scope and boundaries of environment statistics and its links with other statistical domains.

10. The FDES was considered a successful framework that has been used by many countries. It was agreed that the FDES should be used as the starting point and revised on the basis of improved scientific knowledge about the environment and new requirements created by emerging environmental concerns such as climate change and their management.

11. The ecosystem approach was viewed as a promising conceptual foundation for an environment statistics framework and it was recommended to be considered when revising the FDES to reflect the advances in scientific and management thinking.

12. There is already a great deal of environmental information being collected, but: (i) much of it is not being summarized and reported in ways useful outside of the environmental community; and (ii) data collection and reporting have often been conducted to suit the needs of individual policy initiatives. The revised FDES should incorporate not only traditional statistical data collection instruments of national statistical systems but also information from scientific monitoring and should provide the conceptual foundation for better data integration within the environment statistics domain and with other economic and social domains.

13. It was agreed that the revised FDES should be scientifically based and stable over time, but at the same time sufficiently responsive to emerging new scientific and political agendas. It should allow adjustments to different national circumstances, priorities, and different user needs. It should provide a menu approach suitable for countries at different levels of development.

14. The Meeting stressed that the fundamental objective is to improve the quality and availability of environmental information. The revised FDES should assist with national and international coherence of policy-relevant data collection and compilation.

15. The revised FDES should be viewed as a hub between various producers and users of environment statistics. It should provide guidance for establishing the roles of all

relevant data providers and stakeholders within the framework, acknowledging that environment statistics involves different disciplines and data sources.

16. The multilateral environmental agreements and global conventions have to be treated explicitly within the framework.

17. There was general agreement that the revised FDES should provide the conceptual framework for the development of environment statistics and should stay as short, simple and concise as possible. It should not go deeper than identifying statistical topics within the framework and should not include statistical variables, definitions, classifications, tabulations and data compilation methods and best practices.

18. The conceptual framework has to be complemented by statistical handbooks providing the detailed definitions, classifications, tabulations and data compilation methods needed to express the concepts underpinning the framework in official statistics. Much of this work is already in progress under the work programme of the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA) on the revision of the System of integrated Environmental and Economic Accounting (SEEA) and under the ongoing and planned development of international recommendations and data compilation guidelines in different areas of environment statistics. Placing current efforts in the FDES will help identifying gaps in methodological work and will facilitate planning future activities.

19. The Meeting recommended that, as a response to the request by many developing countries, UNSD should also establish a core set of environment statistics to provide guidance to countries with very limited resources and at early stages of environment statistics, and which are not in the position or intend to implement the SEEA. The core set should include a limited number of statistical variables (accompanied by appropriate methodological description and guidance for their compilation) that will provide national and international policy-makers with the most necessary information about issues of interest to countries and also issues that go beyond national boundaries. The core set of

environment statistics should be based on the *UNSD List of Environmental Indicators* (adopted by the Statistical Commission in 1995) and on the assessment of international data collections, major global and regional indicator initiatives, and should consider the most pertinent data needs created by global environmental conventions and multilateral environmental agreements.

20. The Meeting agreed on the following guiding principles for the revision process:

- The revised FDES should be comprehensive and integrative, an overarching framework that encompasses all aspects of the environment.
- The revised FDES should be kept short (maximum 50 pages), concise, and simple to understand and apply.
- The existing FDES should be used as the starting point and revised on the basis of improved scientific knowledge about the environment and new requirements created by emerging environmental concerns and their management.
- The ecosystem approach should be considered as the possible conceptual foundation for the revised FDES.
- The revised FDES should be relevant for both developed and developing countries.
- The revised FDES should aim at basic environment statistics that can serve multiple purposes and facilitate better data integration within the environment statistics domain and with other economic and social domains.
- The focus of the revised FDES should remain on the environment but it should include clear links to economic and social statistics, other frameworks and analytical models, and should be flexible in application to allow use for different purposes.
- The FDES should serve as an interface between producers and users and should mark out the role of different data producers.
- The FDES should target all producers of environment statistics; at the same time, users should also understand and relate to it.

21. The Meeting proposed the following to include in the revised FDES:

- objective;
- target audience;
- scope and boundaries;
- main concepts and definitions;
- relationship with the System of integrated Environmental and Economic Accounting (SEEA);
- links to other frameworks and statistics;
- links to multilateral environmental agreements and global initiatives;
- quality assurance and quality control standards;
- structure, dimensions, categories and components (statistical topics) of the framework;
- spatial and temporal considerations;
- links to statistical tools; and
- reference to existing and planned statistical standards and recommendations for detailed methodological and statistical guidance.

22. The Meeting recommended the following process and modalities for the revision of the FDES. It is important to recognize that this process will yield only the revised *conceptual framework* for environment statistics and does not include ongoing and future work to refine. and standardize the statistical system needed to complement the conceptual framework. Whilst it is recognized that this timeframe is tight, the experts considered it feasible, provided the above mentioned focus on the conceptual framework is maintained.

- The revision of the FDES should be implemented in two years and submitted to the Statistical Commission in 2012.
- UNSD should lead the process and ensure coordination with the UN Committee of Experts of Environmental-Economic Accounting.
- UNSD should convene an expert group including statisticians as well as representatives from the scientific and user communities from all regions to carry out the revision.

- The wider statistical community should engage in this work via electronic means.
- The draft framework should be presented at upcoming international conferences, meetings and workshops in the field of environment statistics to ensure the widest possible discussion and agreement.

23. The Meeting agreed that UNSD should develop a work programme for the revision of the FDES and for the development of a core set of environment statistics including timetable, responsibilities, milestones and intermediate outputs, and submit it to the 41st session of the Statistical Commission for its approval.

ANNEX A.

Session 1: The need for a framework for environment statistics

1. Session 1 was chaired by Eszter Horvath, UNSD. It included four presentations on why a framework is needed for developing environment statistics, the main roles and functions a framework should play, how a paramount framework should be developed with supporting handbooks, and an application of the FDES to the issue of climate change.

2. Robert Smith from Statistics Canada presented an approach to a framework for the development of environment statistics currently under development in Canada. According to the Canadian perspective, a framework is needed to address the current state of ad hoc and uncoordinated environment statistics collection that does not provide adequate empirical information for decision making. An analogy to economic statistics was used to characterize the lack of a common basis for compiling environment statistics. Mr. Smith specified two key necessary elements for the development of a framework: a conceptual foundation laying out the theory that underpins the framework and a statistical system that elaborates the theoretical concepts. In the analogy to economic statistics, these elements were compared to Keynesian economic theory and the System of National Accounts. The presentation described the following five functions of a framework for environment statistics: clearly defines the boundary and scope of environment statistics; ensures quality in the collection; improves organization and publication of environmental data; provides links to other frameworks; and helps assess gaps in existing statistics.

3. Torstein Bye from Statistics Norway presented his perspective of what key principles a framework should apply and what process it should take. The presentation included a proposal for the framework to include guidance on institutional arrangements for environment statistics collection, which would allow for a common understanding and

linkages within and between different institutions, countries and regions, as well as guidance on key principles and definitions. The detailed methods, demarcation, definitions of variables, accounting practices, and other guidance should be included in supporting handbooks. Mr. Bye reviewed much of the influential work in the field of environment and sustainable development statistics and suggested that a common framework for environment statistics should be based on well known principles from these studies. He presented an information matrix as a classification system for environment statistics linking an ecosystem approach to the Driving Force – Pressure – State – Impact – Response (DPSIR) model. It was also noted that a framework should help guide politicians to identify information needed for policy decisions.

4. Jean-Louis Weber from the European Environment Agency reflected his opinions on the role of the framework and what should be included in the revision. He discussed the historical developments of environment statistics, the changing policy agenda, the fast development in information technology, and the great demand for environmental information. He presented a symptoms or "health checkup" approach to developing ecosystem indicators and stressed that more attention should be paid to impacts and costs on ecosystems, on human well being and on the economy. He also mentioned the importance of spatial and temporal dynamics of environmental information. It was concluded that the framework should be a hub for environment information, which provides a communication synthesis infrastructure to foster cooperation between environmental agencies, statistical offices and other stakeholders, and to provide linkages to social and economic statistics.

5. A case study of how the FDES was applied to address statistics on climate change in the Philippines was presented by Raymundo Talento from the Philippines National Statistical Coordination Board. The presentation started with an introduction to the Philippine statistical system and its coordination mechanisms, followed by a brief summary of key social, economic and environment statistics in the Philippines. Mr. Talento then addressed issues and concerns related to the generation of statistics on the impacts of climate change and finished with a summary regarding the mainstreaming of

climate change and related statistics into official statistics of the Philippines. It was concluded that the FDES was a useful tool for this exercise and it should be revised to incorporate new information requirements of climate change.

From the discussions in this session, the key points raised were:

6. There was agreement that a lot has changed in the field of environment statistics and understanding of the environment since 1984. For example, climate change and sustainable development were emerging issues in 1984, but today they are widely recognized as important concepts for environmental information systems. As such it is necessary to review and revise the FDES. The framework should have a common goal to guide how to better invest scarce resources. The framework needs to build upon existing work and not start from scratch. The importance of institutional cooperation was also highlighted in discussions and it was agreed that national statistical offices need to work closely with other data producers and users and target multiple stakeholders and uses of statistical outputs.

7. Some participants expressed different views on the analogy between an environmental framework and the qualities of the System of National Accounts (SNA). It was noted that there is not a single robust conceptual model in environment and ecological sciences comparable to the consensus of economic theory that provided the basis for the development of the SNA in the 1930s and 1940s. Also, environmental information has the added challenge of lacking a common numéraire. It was noted that the current status of economic statistics culminated from the investment of substantial resources and more than 70 years of effort. One expert expressed a concern that the development of environment statistics on par with the development of the SNA might not be suitable in all country circumstances.

8. The experts generally agreed that an important improvement to the FDES would be to define a boundary for environment statistics and establish links to other areas such as the economy and society. It was also mentioned that a conceptual framework should

be stable over the long term, while supporting handbooks could be more flexible and reactive to current needs. It was recommended to develop a revised FDES and supporting handbooks separately, although it was acknowledged that drawing a line between the separate tasks could be challenging. Some experts suggested that the FDES should help bridge the links between existing environment indices and indicator frameworks.

9. It was acknowledged that the FDES structure had incorporated pressure-state-response (PSR) relationships and there was some discussion regarding the continued use of this approach. In some cases the PSR and related models were not widely used by national statistical offices because of a perceived difficultly to objectively place variables within the structure and because some viewed these models as imposing causal relationships on statistics that may not be fully accurate. Other experts, on the other hand, commented that it would be difficult to completely abandon PSR-type models because they were well understood and appreciated by policy makers and other users of environment statistics in many countries.

10. The theoretical basis for an environment statistics framework was discussed and it was agreed that the basis should be rooted in science and not change substantively over time with ever-evolving political priorities and perceptions. Statistics Canada proposed using a theoretical framework based on ecosystem science. Some experts agreed with this strategy while others expressed skepticism whether such an approach had sufficient scientific consensus and whether, in practice, it would be a significant improvement on current approaches in terms of providing practical guidance for filling information gaps in national statistical systems.

11. Aside from the different opinions of the conceptual basis, many participants agreed that a common framework was needed and would be useful for the analysis of environment statistics. Some experts commented that the framework should not aim at serving every purpose and should instead focus on how to answer the most pertinent needs of policy makers. It was also mentioned that the large data gaps in many

developing countries should be a priority for the FDES. It was mentioned that a simplified system would better meet these needs. Others argued that a simple framework could have limitations in reflecting the realities of highly complex environment systems.

12. Some experts commented that social aspects of environmental information, such as relationships to health and human settlements, are important and should be included in the scope of the FDES. On the other hand, some experts found the UN Concepts and Methods Handbook on Human Settlements Statistics (1988) to be loosely related to the environment, and thought it might more aptly fit under a social statistics programme. There was also some discussion of positive or negative implications of language used and whether measurement of human effects on the environment should be presented in a positive, negative, or neutral context.

13. It was suggested that trans-boundary and related issues should be addressed by a revised FDES. Many environmental units, such as rivers, cross administrative boundaries including national borders or municipal boundaries. It was mentioned that Geographical Information Systems (GIS) have increased the possibilities for analysis of environmental data relevant to areas that include territories of two or more countries or administrative regions.

14. Several experts proposed that a core set of environment statistics should be developed and it was noted that it would be possible to do this at a global level but difficult to develop such a set that would meet local level needs. The meeting was informed that UNSD had used the FDES for the development of a list of environmental and related socio-economic indicators which was adopted for international compilation by the Statistical Commission in 1995. In this regard, this list should be reviewed and revised to address the current demands for environmental information.

Session 2: National and international experience with different frameworks for environment statistics and indicators

15. Session 2 was chaired by Edgar Ek from Belize. There were seven presentations on experiences with the development of environment statistics and indicators by national statistics offices, international agencies, academia and non-governmental organizations (NGOs).

16. A presentation made by Marc Levy from the Center for International Earth Science Information Network (CIESIN), Columbia University, focused on the lessons learned from the development of the Environmental Sustainability Index (ESI) and Environmental Performance Index (EPI). The presentation described some of the strengths and weaknesses found in developing and implementing the two indices. The framework for developing the indices was based on the DPSIR model which was seen as a strength since many people were familiar with it. It was noted that the EPI and ESI were seen as useful for targeting policies based on regional comparisons of the index rankings and comparisons of the scores across issues. Ultimately Mr. Levy concluded that no single framework could do well at all of the project's design criteria and therefore what was needed was a family of nested or linked frameworks. He also added that frameworks can be useful for identifying where data are missing; and that although data streams serve multiple purposes, few are organized to do so effectively. Finally, he encouraged the Meeting to think of frameworks in terms of data systems and not data tables.

17. A presentation by Jochen Jesinghaus from the European Commission Joint Research Centre reviewed many of the existing national and international frameworks for environment statistics and provided views on the elements that made a framework successful. Three elements were proposed in the presentation: the framework was functional in the sense that databases were produced; the framework was used continuously in multiple periods (i.e. not a project that was abandoned after a single implementation); it contained all expected aspects for environmental policy. The Millennium Development Goals (MDG) indicators were offered as an example of a

successful framework, particularly for developing countries, because of its exceptional high-level political support.

18. Robin O'Malley of the Heinz Center (USA) summarized the approach used in the development of *The State of the Nations Ecosystems* publications. He emphasised that the model used was a descriptive and reporting framework rather than a conceptual framework. Key principles of the publications were to: focus on trends and the entire information chain; be politically neutral and avoid emphasizing cause-effect relationships; be scientifically excellent; be policy relevant (connects to local and national decisions); and produce more than a one-time report. The process involved multiple sectors – government, business, environmental NGOs, and academia; used multiple skill sets – policy, legal advocacy and technical skills; and went through multiple rounds of collaborator and external reviews. The descriptive framework used by the Heinz Center organized ecosystem information into four categories: extent and pattern; chemical and physical characteristics; biological components; and goods and services. In the presentation, Mr. O'Malley mentioned that they found it important to incorporate human settlements as part of ecosystems and describe the human use of ecosystems in neutral language, rather than strictly as pressures or stressors. It was found that policy relevance generally meant focusing on specific ecosystem issues or regional impacts as there was limited interest among politicians for broad national measures. He commented that a big challenge for national statistical systems is improving the coherence of basic data occupying the base of the information pyramid and identifying gaps in the information chain. Mr. O'Malley also briefly introduced a conceptual framework developed by the Integration and Synthesis Group coordinated by the White House Council on Environmental Quality.

19. Jesus Romo Garcia from the National Statistical Institute of Mexico, described the development of environment statistics in Mexico, presented current institutional arrangements, and discussed the need for a reference framework in this context. Mr. Romo presented his view that the FDES should incorporate three dimensions: themes, causality, and ecosystems, and it should also provide recommendations about the

temporal and spatial dimensions, and a clear relationship with the System of integrated Environmental-Economic Accounting (SEEA) and the Commission for Sustainable Development (CSD) Indicators of Sustainable Development.

20. An overview of Malaysia's experience in the development of environment statistics and implementation of the FDES was presented by Soh Wah Lim, from the Department of Statistics in Malaysia. A national framework for the development of environment statistics was developed based on the FDES but with modifications to fit national needs. In the case of Malaysia, the implementation of the FDES evolved into several important developments in their information systems, including an inter agency committee and mechanism for exchanging data and expertise. It was concluded that the FDES was a useful guide in the development and compilation of environment statistics in Malaysia and that it is really needed in developing countries. Another crucial need is the development of standard definitions and classifications.

21. Fanta Kaba from Guinea presented her work on environment statistics with the Economic Community of West African States (ECOWAS) and on the implementation of the FDES in Côte d'Ivoire and in the ECOWAS region in general. In the presentation it was mentioned that UNSD provided critical assistance and technical support for the establishment of environment statistics in Côte d'Ivoire, as well as for the adoption of the ECOWAS Strategy for environment statistics and of the core set of environmental indicators for the region. In Côte d'Ivoire the FDES was used to assess the data requirements, and to identify the variables, data sources and data availability. The FDES was also helpful in the establishment of institutions for the coordination and collection of relevant information and in the effective participation of stakeholders. The core set of environmental indicators for the ECOWAS region was developed by integrating the FDES with The New Partnership for Africa's Development (NEPAD), which serves as the policy framework.

22. Reena Shah from UNSD provided a brief overview of the experiences of the application of FDES in a number of countries from several regions. From the country

experiences she noted the following observations in particular: the FDES provides a detailed list of statistical topics which serves as a useful guide for the identification of relevant statistics and variables; the FDES is useful in assisting countries in developing national sets of environmental statistics and indicators; the flexibility of the FDES permits modifications in the environmental components, information categories and statistical topics; aspects of other frameworks such as the PSR, can be integrated under the FDES umbrella. The general conclusion from the presentation was that the implementation of the FDES was effective in facilitating the development of environment statistics in all the countries reviewed. However, it was noted that the FDES needs to be revised to reflect changes in the demand for environment statistics since its publication in 1984.

From the discussions in this session, the key points raised were:

23. A fundamental objective for the development of environment statistics should be to improve the quality and availability of information of high policy relevance. The FDES should assist with national and international coherence of policy-relevant data collection and compilation. It was mentioned that policy makers and other users of data are an important target group for FDES and the existence of "political will" and support of policy makers is important for its successful implementation. Several experts added that national laws and related reporting requirements can facilitate the development of environment statistics.

24. It was noted that the framework should assist data producers to connect with users and better identify and fulfil multiple purposes of data. It was mentioned that often users of environment statistics look directly to ecologists and other scientists, rather than to the statistical community, for environmental information. Therefore, the framework should help to bring the scientific community, statistics community and user community together. One expert noted that one of the challenges of the FDES is the need to incorporate not only traditional data collection instruments of national statistical systems, but also information from scientific monitoring.

25. It was generally agreed that flexibility is a key principle for the FDES. Each country implemented the FDES with some modifications reflecting different national circumstances and different existing national and international reporting demands. The presentations on country experiences and the work of CIESIN drew attention to the complexity of the measurement of environmental issues and the fact that different measurement purposes may require different approaches. It was also noted that since resources for producing environment statistics vary greatly across countries, having a flexible framework is needed to address different priorities.

26. Several experts viewed institutional arrangements for collection and communication of relevant information as imperative. It was noted that a key challenge in all statistical systems is building awareness among all parties of the framework and of statistical quality standards. Some questions were raised about how a revised FDES could specifically address issues of institutional arrangements for compiling data and it was recommended that, in its revision, the FDES should consider this issue in more detail.

27. Participants also emphasized the importance of linkages to existing frameworks, analytical models and uses of statistics, as well as with other related areas of statistics. There was some discussion on the relationships between the FDES and the SEEA, the PSR model, the MDG and CSD Indicators, and multilateral agreements. Several experts also stressed that the FDES should reflect the multidisciplinary nature of environmental information, incorporating relationships with social and economic issues.

28. Some experts supplemented the discussion with national experiences related to the implementation of the FDES as well for regional and international initiatives such as the statistical programme for the Mediterranean partner countries (MEDSTAT) coordinated by the Statistical Office of the European Communities (Eurostat), the programme of the Economic Commission of Latin America and the Caribbean (ECLAC), and the Montreal Process Working Group on Forest Indicators. It was noted that

producing environmental compendia publications, one of the outputs of earlier implementation of the FDES and still widely practiced, is resource intensive and not very effective at communicating statistics for policy making. Several countries indicated that they were moving away from producing printed compendia and more towards thematic publications, while the dissemination of general environment statistics is being taken up by online databases.

29. Some participants commented that it is important to have a list of environmental indicators for countries to embark on the development of environment statistics, such as the ECOWAS list of indicators adopted at the Abuja workshop in 2008 for the ECOWAS region. It was also mentioned that there is a strong need for assistance from UNSD to help developing countries to implement the FDES and develop an environmental statistical system that meets multiple policy needs.

Session 3: The Canadian approach towards a framework based on ecosystems

30. Session 3 was chaired by Torstein Bye (Norway) and had one presentation by Robert Smith on Statistics Canada's approach towards a framework on environment statistics.

31. This new framework for developing environmental statistics was motivated by the Canadian Chief Statistician's observation that environmental statistics are collected in an ad hoc manner. There are also significant concerns with the quality of many environmental statistics. This framework, based on an ecosystem approach, is intended to ensure relevance and improve data quality by collecting data that fulfills a long-term and high-level policy objective and focusing on the environment as a whole, rather than emphasizing the linkage between the environment and the economy. It was noted that the Canadian framework was still a proposal and had not yet been implemented in Canada.

32. The proposed high-level policy objective for the Canadian framework was maintaining environmental quality. It was believed that there was a need to define environmental quality in order to give boundaries to the framework. An ecosystem approach was selected because the state of ecosystems was understood to be the basis of environmental quality. In the presentation, four ecosystem quality dimensions were proposed: extent and pattern, stability, diversity, and productivity (goods and services).

From the discussions in this session, the key points raised were:

33. There was general agreement that there are serious quality problems with environmental statistics. The ecosystem approach was viewed as a possible conceptual foundation for an environment statistics framework that could, if widely adopted, do much to improve this situation.

34. However, there were questions about how the proposed ecosystem approach would relate to the current FDES structure and PSR-type approaches. There was strong concern that abandoning PSR-type models would reduce the transparency of the sources of environmental problems. Several experts noted that analytical models, such as the PSR and DPSIR, are well established and are very useful in countries. Statistics Canada responded saying that although the PSR model is useful when reporting data, their experience was that it presented difficulties since the causal relationships were seen as not well understood and rarely fitting with the implicit linear nature of the model. The PSR and related models can and should still be used for reporting since they are appealing to policy makers.

35. There was discussion as to whether the ecosystem approach fully addressed the concept of sustainability. Statistics Canada suggested that ecological sustainability can be addressed by examining stocks, flows and the provision of ecosystem goods and services.

36. Several interventions expressed the importance of ensuring linkages between environmental statistics and other types of statistics, such as economic and social statistics, and information on natural events and human settlements. Statistics Canada responded by agreeing that human settlements were an important ecosystem component and mentioning that information produced within the scope of their ecosystems framework could still be used to provide linkages to other areas of statistics by ensuring methodological coherence and allowing for analysts to make the links that combine health and environment, for instance, or economy and the environment.

37. There was discussion on the level a framework should address. Statistics Canada felt that the framework should address high-level policy questions at the national level, not at local or regional levels. Many argued that a framework should address both macro and micro levels of policy and statistics. National level information needs to be brought down to local level to ensure the consistency through all levels. The importance of the spatial dimension of environmental information was stressed in this context, since it helps to show the condition of the ecosystem and how it varies across the country.

38. There was also concern that basing a definition of "environmental quality" on ecological science would be too difficult and would be too far out of the usual areas of expertise of national statistical offices. One expert recommended considering a more focused set of goals, suggesting as an example the goals that have been adopted for the Montreal Process for Forests. Statistics Canada noted that working closely with scientists and other data providers would be necessary regardless of the approach.

39. The use of the ecosystem approach was discussed as a possible basis for the revision of the FDES. The ecosystem approach was seen as improving on the FDES in terms of incorporating current understanding of environmental science.

40. It was proposed that a revised version of the FDES could be viewed as a work plan for statisticians and data providers to develop basic environmental statistics. It was agreed that a revised framework should also provide guidance for establishing the roles

of all relevant data providers, acknowledging that environmental statistics involves different disciplines and data sources.

41. An intervention drew the attention to the progress made by FAO in recent years in the development of theme and indicator frameworks. FAO has a long history of gathering and reporting a large amount of natural resource information and has become one of the thought leaders in shaping environmental reporting. This expertise needs to be factored into the FDES process if the FDES is to incorporate an ecosystem approach.

42. In conclusion, there was general support for a revised framework and that the ecosystem approach could be incorporated into the revision of the FDES. However, several experts stressed that the framework should be kept simple and applicable to both developed and developing countries. The revised FDES should have an umbrella function including all the work that has been done and bridging different methodologies used in different areas.

Session 4: A review of the UN Framework for the Development of Environment Statistics (FDES) and its accompanying technical reports

43. Session 4 was chaired by Torstein Bye (Norway) and had four presentations providing a review of the FDES in the contexts of: a comparison to the Canadian approach presented in Session 3, the UNSD Global Assessment of Environment Statistics and Environmental-Economic Accounting, the emergence of multilateral environmental agreements and related international initiatives, and the feedback to the FDES received from experts in writing prior to the meeting.

44. Eszter Horvath from UNSD presented a comparison between the Canadian approach and the FDES. Ms. Horvath provided an overview of what is meant by a framework and then described the purposes and properties of the FDES. She explained the evolution of the FDES which was based on the stress-response model. She described the structure of the FDES which relates basic components of the environment to

information categories, and noted that the basic components are those of the ecosystems. The information categories include data on stocks and flows which can be related to the PSR model. She also described the contents of the FDES and the two accompanying technical reports. She then provided a comparison between the FDES and the Canadian approach which have many similarities, and concluded by proposing that during the revision of the FDES, the ecosystem approach be considered as the conceptual foundation of the framework

45. Yongyi Min from UNSD presented a summary of results of the Global Assessment of Environment Statistics and Environmental-Economic Accounting that was undertaken by UNSD in 2006. Her presentation described the main objectives of the Assessment, and then focused on the results of the environment statistics part, for which there was a response rate of 54 per cent. Among the 104 responding countries, 94 indicated that an environment statistics programme exists in the country. With regard to the scope of the environment statistics programme it was noted that the 5 main areas covered were water, air, forest, land and agriculture. Environment statistics were mostly disseminated through statistical publications and the internet, and the most common use of environment statistics was for the derivation of indicators. The two main impeding factors for the development of environment statistics were the lack of human and financial resources, and the two main impeding factors for the compilation of environment statistics were the availability and quality of data.

46. Daniel Clarke from UNSD presented a review of the many global developments, particularly multilateral environmental agreements (MEAs) and global conventions since the publication of the FDES with a focus on specific data requirements and reporting frameworks. He focused on the MEAs stemming from the 1992 Rio Earth Summit and the international data requirements as outlined in Agenda 21. He noted that the mix of MEAs and reporting requirements represent a complex and uncoordinated set of demands on producers of environment statistics. Environmental information is required at different spatial and temporal scales and this is important because of how it affects policy messages and communication of data. Mr. Clarke then illustrated how the data

requirements for specific MEAs, such as the Convention on International Trade in Endangered Species (CITES) and the Montreal Protocol, could be identified through the FDES. He also presented the Millennium Ecosystem Assessment Framework and explained that it is similar to the FDES and DPSIR-type approaches except that it includes "feedback" or multidirectional relationships. Finally, Mr. Clarke described the main international indicators sets such as the CSD set and the MDG indicators, and some composite indices such as the ecological footprint, in order to illustrate the complex scope of information requirements from national statistical systems and its relationship to work on revising the FDES.

47. Jeremy Webb from UNSD presented a summary of the feedback based on a template containing questions regarding the FDES sent to the participants prior to the meeting. He focused his presentation on the feedback to the scope and contents of the FDES, the relevance of the various parts of the FDES, the implications of MEAs on the FDES, the main audience of the FDES, the role that the FDES should fill, whether the FDES should be kept separate from the accompanying handbooks, whether the revised FDES should touch upon the issues of the relationship between environment statistics and official statistics and the role of the different stakeholders, whether the FDES should give guidance for the process of institutionalization of environment statistics, and whether a core set of statistics and indicators should be recommended for countries to use as part of the FDES. He also presented the feedback to specific questions regarding the four chapters of the FDES.

Session 5: The way forward

48. The session was chaired by Michael Nagy (Austria). He presented a list of suggested guiding principles, contents, direction and modalities for the revision of the FDES based on the feedback received and the discussions of the first two days.

49. He introduced a set of guiding principles for the FDES. The framework should be (i) scientifically excellent; (ii) simple to develop and adopt; (iii) short; (iv) stable over

time but flexible to accommodate new policy needs; (v) linked to a high level objective; (vi) aiming at basic statistics; (vii) addressing all producers of environment statistics; (viii) supporting the development of multipurpose environment statistics; (ix) supporting other statistical frameworks; (x) useful to different groups of users.

50. As to the contents of the FDES, the framework should contain information on the following: (i) high level objective; (ii) purpose and target audience; (iii) framework structure and statistical topics; (iv) clear links to other frameworks and analytical models; (v) clear links to indicator frameworks.

51. As to the direction of the revision, he raised the question whether the existing conceptual basis is enough or there is a need to refine it to include the ecosystem dimension.

52. As to the modalities of the revision process, he presented the following suggestions; (i) the process should be led by UNSD; (ii) a small intergovernmental expert group with proper regional representation should be set up from interested countries with the mandate to carry out the revision; (iii) the revision process should conclude in two years.

From the discussions in sessions 4 and 5, the key points raised were:

53. It was noted that to develop a scientifically sound conceptual framework is not an easy process. Some participants raised the question whether we need a new framework based on ecological science or it is better to keep the useful elements of the existing FDES. It was noted that it could be possible to have a multidimensional framework, which is based on the existing combination of the media approach (or components of the environment in the FDES) and the stress-response approach (or activities, impacts, responses, stocks in the FDES), and incorporates the ecosystem approach as a new dimension. However, the adding of a new dimension will not fully reflect the advances in

scientific thinking. Adopting an ecosystem approach should mean more than simply reporting in ecosystem-denominated categories.

54. It was noted by several interventions that the ecosystem approach and the well-known analytical models such as the DPSIR sit very well with policy makers therefore the framework has to contain links to them.

55. Several experts warned against linking the framework to a single high level policy objective. They said that (i) agreeing on a single policy objective would be difficult and may not be possible and (ii) the high level policy objective would need to be translated into more operational terms for the purposes of the framework anyway.

56. It was also noted that a clear definition of the scope and boundaries of environment statistics should be part of the framework. On the other hand, the importance of the links to social and economic statistics and the need for capturing them sufficiently in the framework was stressed repeatedly by many participants. The analogy of an architect designing a new building was offered, in which the architect has to simultaneously be concerned about: (a) how the exterior design of the new building will fit into the existing neighborhood of other buildings and add to the overall city-scape; and (b) how the interior design of the new building functions to meet the needs of its occupants. The FDES must be relevant externally: mesh well with the overall landscape of national statistics and indicators of many kinds (e.g., economic, social, and ecological measures and reports). It also has to be relevant internally: have direct relevance, importance, and meaning to governments and interests focused on the environment. As the architects for the FDES, both perspectives should be addressed, namely, how the statistics inform the broader policy community concerned with economic, social and other issues (the exterior of the building) as well as how the statistics inform the policy community focused specifically on the environment (the interior of the building).

57. The FDES should also address the users of environment statistics. It was reiterated that the framework should serve as (i) a hub between various producers and

users and (ii) a long term work programme for environment statistics. It should identify the statistical topics as its building blocks but should not go into the details of statistical variables and methodologies.

58. Participants stressed again that the multilateral environmental agreements, global conventions and indicator initiatives have to be treated explicitly within the framework.

59. Several participants raised again the issue of the relationship of the FDES, and environment statistics in general, with the SEEA. As it was described, the SEEA takes the system approach and its well developed modules are on their way to become an international statistical standard (Volume I of the SEEA) supported by a comprehensive suite of methodological publications including data items, definitions and classifications. Volume II will contain the less developed modules, while Volume III will be dedicated to the applications of the SEEA with explicit reference to cross cutting high level policy issues such as natural resource management, sustainability and climate change.

60. Participants noted that the SEEA is an excellent tool to link the environment and the economy but it cannot handle the social links, natural processes and the issues of environmental quality. The FDES should be a comprehensive framework that covers all aspects of the environment, not just the environment-economy link. Others noted that not all countries wish to or can follow the accounting approach.

61. It was stressed that the revised FDES should be a relatively short and stable document that is supported by more detailed publications containing the methodologies, classifications and definitions. While a conceptual framework is necessary, the statistical variables and the related methodological guidelines are at least as important as the framework. Several participants asked how the development of these guidelines fits into the process and what the distinction between a conceptual and a statistical framework means in terms of the time frame of the revision process. In this regard it was stressed that coordination is needed over ongoing methodological work to avoid duplication, to identify gaps and develop synergies.

62. It was noted that much of this work is in progress under the work programme of the United Nations Committee of Experts on Environmental-Economic Accounting as part of the revision of the SEEA and under the ongoing and planned development of international recommendations and data compilation guidelines in different areas of environment statistics. Placing current efforts in the FDES will help identifying gaps in methodological work and will facilitate planning future activities.

63. It was stressed that there are countries which are not in the position or intend to implement the SEEA. There is a need for a core set of environment statistics to guide countries with very limited resources and at early stages of environment statistics. The core set of environment statistics should be based on the *UNSD List of Environmental Indicators* (adopted by the Statistical Commission in 1995) and on the assessment of international data collections, major global and regional indicator initiatives, and should consider the most pertinent data needs created by global environmental conventions and multilateral environmental agreements.

64. It was agreed that UNSD set up an intergovernmental expert group to implement the revision of the framework. A time frame of two years was proposed to ensure that the document is produced in a timely manner. This process will yield only the revised *conceptual framework* for environment statistics and does not include ongoing and future work to refine and standardize the statistical system needed to complement the conceptual framework. Whilst it is recognized that this timeframe is tight, the experts considered it feasible, provided the above mentioned focus on the conceptual framework is maintained. A parallel process is needed to develop a core set of environment statistics for countries that have limited resources and are at the early stages of development of environment statistics.

65. The Meeting agreed that UNSD should develop a work programme for the revision of the FDES and for the development of a core set of environment statistics

including timetable, responsibilities, milestones and intermediate outputs, and submit it to the 41st session of the Statistical Commission for its approval.

ANNEX B

Expert Group Meeting on the Framework for the Development of Environment Statistics (New York, 10-12 November 2009)

Agenda

Tuesday, 10 November 2009

9:30 -10:00	Registration of participants
10:00 -10:30	Opening of the Meeting by Paul Cheung, Director, UNSD Introductions Objective of the meeting

10:30 – 1:00 Session 1: The need for a framework for environment statistics

- Need for basic organizing structure
- Integrate with economic and social statistics
- Identify the scope and boundaries of environment statistics
- Assess gaps and weaknesses in existing statistics
- Identify the role of different stakeholders
- Identify a core set of statistics/indicators

Presentations followed by discussion:

A Framework for the Development of Environmental Statistics I. (Robert Smith, Canada)

11:00 -11:30 Coffee break

Environment Statistics: Frameworks, Classifications, Statistics (Torstein Bye, Norway)
Environmental Statistics, Monitoring and Assessment (Jean-Louis Weber, EEA)
An application of the framework for the development of environment statistics: the issue of climate change (Raymundo Talento, Philippines)

1:00 - 2:30 Lunch break

2:30 - 6:00 Session 2: National and international experience with different frameworks for environment statistics and indicators

Presentations followed by discussion:

Framework for the selection of the ESI/EPI indicators (Marc Levy, CIESIN)
The environmental pillar of the MDG Framework (Jochen Jesinghaus, EU JRC)
The State of the Nation's Ecosystems Project and Conceptual Model Development (Robin O'Malley, USA)

4:00 - 4:30 Coffee break

Reference frameworks and Environmental Statistics in Mexico (Jesus Romo Garcia, Mexico)
Overview of Malaysia's experience in the development of environment statistics (Soh Wah Lim, Malaysia)
The environment statistics programme in Cote d'Ivoire and the ECOWAS region (Fanta Kaba, Cote d'Ivoire)
Lessons learned from the country implementations of the UN FDES (Reena Shah, UNSD)

6:00-8:00 Reception
(DC2-14th floor)

Wednesday 11 November 2009

9:30 - 1:00 **Session 3: The Canadian approach towards a framework based on ecosystems**

- The primary purpose of the Framework
- Specifying the target variables
- Identifying the subcomponents
- From concepts to measurement
- Linking framework to policy

Presentation:
A Framework for the Development of Environmental Statistics II (Robert Smith, Canada)
Discussion

11:00 - 11:30 Coffee break

Discussion (continued)

1:00 - 2:30 Lunch break

2:30 - 6:00 **Session 4: A review of the UN Framework for the Development of Environment Statistics (FDES) and its accompanying technical reports**

- FDES Chapters I-IV (New York, 1984)
- Concepts and Methods of Environment Statistics: Statistics of the Natural Environment (New York, 1991)
- Concepts and Methods of Environment Statistics: Human Settlement Statistics (New York, 1988)

Presentations:
The UN FDES and the Canadian approach: a comparison (Eszter Horvath, UNSD)
Global Assessment of Environment Statistics (Yongyi Min, UNSD)
Multilateral Environmental Agreements, Global Assessments and Indicator Initiatives (Daniel Clarke, UNSD)

4:00 - 4:30 Coffee break

Summary of comments sent by the participants (Jeremy Webb, UNSD)
Discussion

6:30- **Dinner**

Thursday 12 November 2009

9:30 – 1:00 **Session 5: The way forward**

Revision of the UN FDES based on national and international developments

- direction
- modalities
- work programme
- contributions
- timetable

Discussion

11:00 - 11:30 Coffee break

Discussion continued

1:00-2:30 Lunch break

2:30-5:00 **Session 6: Conclusions**

Conclusions and recommendations
Outline of a report for the 41st Session of the Statistical Commission

ANNEX C

DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

Expert Group Meeting on the Framework for the Development of Environment Statistics
New York, 10-12 November 2009
2 UN Plaza – 23rd Floor Conference Room

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