

**First Meeting of the Expert Group on the Revision of the Framework
for the Development of Environment Statistics
New York, 8-10 November 2010**

Report

1. The First Meeting of the Expert Group (EGM) on the revision of the Framework for the Development of Environment Statistics (FDES), organized by the United Nations Statistics Division (UNSD), was held in New York from 8 to 10 November 2010.

2. The meeting was attended by 29 experts from Australia, Austria, Belize, Botswana, Brazil, Canada, Czech Republic, Estonia, Finland, India, Italy, Jamaica, Mauritius, Mexico, Netherlands, Nigeria, Norway, Philippines, Suriname, United Arab Emirates, United States of America, the European Environment Agency, Eurostat, the World Resources Institute, the Food and Agriculture Organization of the United Nations, the United Nations Economic Commission for Latin America and the Caribbean, the United Nations Economic Commission for Africa, the United Nations Development Policy and Analysis Division, and the United Nations Committee of Experts on Environmental-Economic Accounting. The experts from Bangladesh, Indonesia, the European Commission Joint Research Centre, the United Nations Environment Programme and the International Institute for Sustainable Development could not participate in the meeting.

3. The meeting was opened by Ms. Eszter Horvath, Chief of the Environment and Energy Statistics Branch, UNSD. After welcoming the participants she summarized the most important steps since the preparatory Expert Group Meeting on the FDES in November 2009.

4. The 41st session of the UN Statistical Commission in February 2010:
- (a) Recognized the importance of environment statistics and congratulated the Expert Group on its excellent work and report;
 - (b) Acknowledged that the 1984 *Framework for the Development of Environment Statistics* has been a useful framework in many countries for the development of environment statistics;
 - (c) Endorsed the programme of work for the revision of the *Framework* and the development of a core set of environment statistics;
 - (d) Cautioned that the current efforts related to the revision of the System of Environmental-Economic Accounting (SEEA) should not be diluted;
 - (e) Emphasized, with regard to the guiding principles for the revision, the need to:
 - (i) Engage all stakeholders, including the scientific community, in the process;
 - (ii) Ensure complementarity with the SEEA;
 - (iii) Use caution when considering the ecosystem approach or other policy frameworks as the conceptual foundation for the revised *Framework*;
 - (iv) Provide supporting methodological guidance and best practices within a reasonable time following the revision of the *Framework*;
 - (f) Recommended, with regard to the proposed contents of the revised *Framework*; that higher visibility be given to the need for institutional coordination and cooperation, and work that has been done at the regional level;
 - (g) Asked the United Nations Statistics Division to develop a more realistic timetable, in consultation with countries and other stakeholders;
 - (h) Noted the importance of greater involvement by the Intersecretariat Working Group on Environment Statistics in the development of the *Framework*;
 - (i) Welcomed the interest and the willingness of countries and agencies to contribute to this work and participate in the planned expert group;
 - (j) Welcomed the proposal by the United Nations Statistics Division to develop a website that would serve as a knowledge base for country practices on environment statistics.

5. In accordance with the decision of the Statistical Commission, UNSD formally convened the Expert Group. In addition to the experts who attended the preparatory meeting in November 2009, experts were invited from countries and bodies that expressed their interest to participate in the revision process including the Intersecretariat Working Group on Environment Statistics and the UN Committee of Experts on Environmental-Economic Accounting. The Expert Group represents 23 countries and 11 international, regional, intergovernmental and non-governmental organizations and specialized bodies.

6. Ms. Iva Ritschelova, President of the Czech Statistical Office, and Mr. Rusman Heriawan, Director General of Statistics Indonesia accepted the invitation of UNSD to act as co-chairs of the Expert Group and oversee the revision process.

7. The Terms of Reference of the Expert Group, a detailed Programme of Work with outputs, responsibilities and timelines, a first provisional annotated outline of the revised FDES and a list of issues for discussion, together with a call for issue papers, were drafted and circulated to the members of the Expert Group and revised on the basis of comments received.

8. The agenda of the First Meeting of the Expert Group was developed on the basis of the draft annotated outline of the revised FDES and the issue papers contributed by the members of the Expert Group.

9. Ms. Horvath summarized the objectives of the EGM as to: (i) reach agreement on a scientific theory that could underpin a conceptual framework for environment statistics; (ii) discuss and if possible, conclude on the issues presented in the issue papers; (iii) finalize the outline of the revised FDES and agree on the general contents of its chapters; (iv) agree on the process to establish the core set of environment statistics; and (v) finalize the Terms of Reference of the Expert Group and the detailed programme of work for 2011.

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

- Session 1: The nature of environment statistics (plenary)
- Session 2: The framework for environment statistics (plenary)
- Session 3: Core set of environment statistics (plenary)
- Session 4: Outline of the revised FDES (working groups and plenary)
- Session 5: Conclusions and work programme (plenary)

11. The discussions were based on 16 issue papers and 6 papers on country practices. All papers and presentations submitted for the EGM are available and can be downloaded from the Expert Group's website at <http://unstats.un.org/unsd/environment/fdes.htm>

12. The main conclusions and recommendations of the meeting (Session 5) are summarized in the following paragraphs 13 - 21. A summary of the presentations and discussions in Sessions 1 - 4 is attached as Annex A. The work programme of the meeting is attached as Annex B. The list of participants is attached as Annex C.

Main conclusions and recommendations of the Meeting

13. The Expert Group concluded that there has not yet been agreement on a single scientific theory upon which the framework for environment statistics could be based. While an agreed scientific theory provides a strong and sound foundation for a conceptual framework, it is not a necessary precondition to begin the process of revising the 1984 FDES. While the Expert Group deliberates on what scientific theory can best support the conceptual framework, work towards the revision of the FDES and the establishment of a core set of environment statistics has to start. It was agreed therefore that work should progress in two parallel processes which later could be merged once options for the conceptual framework have been identified and agreed upon by the Expert Group.

14. The Expert Group invited UNSD to initiate the process of revising the 1984 FDES and the development of a core set of environment statistics. This work should be guided by the agreed scope and criteria, and focus on the analysis of the structure, and components of the 1984 FDES, identifying and developing those dimensions, building blocks and statistical topics that are not, or not fully, covered by the 1984 Framework. The extensive analysis and assessment of country practices, existing regional and international indicator sets, data requirements created by major international environmental conventions and agreements, as well as new initiatives on measuring the green economy and well-being should continue and feed into the revision of the FDES and should provide the basis for the identification of a core set of environment statistics. A subgroup should be formed by members of the Expert Group to help UNSD in this work.

15. The Expert Group also invited Statistics Canada to further elaborate on their proposal to apply the natural capital theory to develop a conceptual framework for environment statistics, and illustrate the dimensions, structure and contents (statistical topics) of the resulting framework. It was requested that other scientific theories that could underpin a conceptual framework for environment statistics should also be explored, taking into account the FDES and the criteria for a framework agreed upon by the Expert Group. It was suggested that a subgroup be formed by interested Expert Group members to assist Statistics Canada in this work. Once the subgroup has identified options for the conceptual framework, they will be brought back to the full EG for discussion.

16. The two parallel processes should be carried out in close collaboration with one another to promote synergies and cross-fertilization.

17. UNSD was requested to put into operation the electronic discussion forum set up at the Expert Group's website to facilitate discussion of interim documents. It was recommended that the discussion should engage a wider spectrum of experts including representatives of the scientific and the user community.

18. The EGM requested that the subgroup, led by UNSD produce the following documents for the next meeting of the Expert Group in May 2011:

- A working paper on the revision of the 1984 FDES regarding its structure, and components, as well as identifying and developing those dimensions, building blocks and statistical topics that are not, or not fully, covered;
- A first draft of the core set of environment statistics with the description of the process that was used for its establishment.

19. The EGM also requested that the subgroup led by Statistics Canada prepare a paper on the elaboration of the natural capital theory in terms of the dimensions, structure and contents (statistical topics) of a resulting conceptual framework and on the exploration of other scientific theories that could have the potential of underpinning a conceptual framework for environment statistics, to be discussed at the next meeting of the Expert Group.

20. UNSD was requested to finalize the Terms of Reference and the detailed Programme of Work of the Expert Group according to the conclusions of the Expert Group Meeting and to present them, together with a progress report, to the forty-second session of the UN Statistical Commission in February 2011.

21. The next meeting of the Expert Group will be held in New York from 4 to 6 May 2011.

Annex A

Summary of the discussions and conclusions of the First Meeting of the Expert Group on the revision of the Framework for the Development of Environment Statistics

Sessions 1-4

Session 1: The Nature of Environment Statistics

1. Session 1 was chaired by Iva Ritschelova. The moderators of the session were Hendrik Jan Dijkerman and Khamis Raddad. The session had seven presentations on the multidisciplinary characteristics of environment statistics and its requirement for institutional cooperation, the challenges in organizing environment statistics, the interactions and integration of environment statistics with other information systems and domains, and statistical units in environment statistics. The session also included two presentations on country practices.

2. Leo Koltola presented the organizational challenges for environment statistics. The field of environment statistics is relatively young compared to economic and social statistics. The borders of environment statistics are much less clearly defined than those of economic statistics and social statistics. Currently, many environment policies are based on information available instead of transparent environment statistics. The presentation described the distinction between statistical and other information, and how to make more benefit of the monitoring, research and administrative data in compilation of environment statistics. He emphasised that the focus of environment statistics should be on the state of the environment.

3. A presentation made by Jean-Louis Weber focused on the interactions of environment statistics with other information systems. Environment statistics connect and interact with national and international compliance reporting, monitoring networks and databases, scientific programmes and modelling, geographic information systems, sector statistics and national accounts. Data from these information systems can be used for environment statistics. In his opinion, the revised FDES should function as a hub to connect environment statistics with different domains which interact with the environment. The information hub provides a synthesis to link the environmental statistics flows from and to other statistical domains.

4. Christian Heidorn presented his opinions on the integration of other statistical domains into environment statistics. He gave several examples to illustrate that using statistics from other domains can provide valuable environmental information, for example, using energy statistics to calculate the greenhouse gas emissions and using production statistics on packaging material to calculate the generation of packaging waste. Through multiple uses of data, shared data processing and common methodology, environment statisticians can replace the stovepipe approach with a more integrated approach to produce environment statistics. This integrated approach also helps reduce the burden for respondents. The revised FDES can develop guidance on the integration of other statistical domains into environment statistics.

5. A presentation by Wadih Neto reviewed the main methods of obtaining basic data for environment statistics and emphasized the importance of institutional cooperation to produce environment statistics. Environmental information can be generated from remote sensing and mapping, surveys and censuses, administrative records/recompilation, statistics of monitoring systems, and statistics derived or indirectly estimated. Environment statistics include a diversified range of subjects and require a complex system that covers different methods of data acquisition and the establishment of a network of institutional cooperation.

6. Michael Nagy expressed similar views in his presentation about multiple uses of data and institutional cooperation being the key requirements to a sound basis for environment statistics. The multidisciplinary nature of environment statistics requires data from different sources, which use different methods of compiling the data. Currently data from different sources result in the duplication of data flows, contradicting data collected on the same topics, and in problems with institutional data sharing. A framework is needed to develop a national data collection strategy to address the above mentioned problems.

7. Kristina Taboulchanas focused on the institutional dimension of environment statistics. The presentation identified the main institutional challenges in the production of environment statistics and presented four key elements of institutional dimension, namely: the legal framework; institutional arrangements; inter-institutional collaboration; and government collaboration at different levels. The presentation proposed that the institutional dimension should be explicitly addressed in the development of the revised FDES.

8. A presentation by Michael Vardon addressed the identification, definition and classification of statistical (observation) units in environment statistics. Statistical units are a key concept as they relate to the collection, compilation, analysis and dissemination of statistics. The determination of statistical units in environment statistics will help to define the components of the environment about which data are compiled or from which data are collected, to describe the main classifications of statistical units relevant to environment statistics, and to define the main characteristics of statistical units so that survey frames and the related statistical infrastructure needed for environment statistics can be constructed or existing infrastructure adapted. Land area (or land parcel) was proposed as a fundamental statistical unit of the environment. It is then possible to attach a variety of other units or descriptions of units to the land, including an owner (an economic unit) as well as physical features of the environment (such as a lake or forest). However defined, the units that make up the environment are a mix of biological (e.g.,

plants and animals) and physical (rocks, minerals, water, etc.) components, and these interact in complex ways among themselves and with the units of the economy.

9. Ditshupo Gaobotse made a presentation on environment statistics and its development in Botswana. They have been collecting and compiling environment statistics using the FDES since 1995 and have produced several environment statistics reports on various environmental areas. The FDES has helped to give direction on how and where to start environmental data collection and compilation. It also brings coherence and relevance to environmental information. However, the FDES needs some revision to address its challenges and to improve its usage.

10. In the Netherlands, as presented by Hendrik Jan Dijkerman, environment statistics has been developed since the seventies and currently there are 35 employees in Statistics Netherlands working in different fields of environment statistics. There was no framework used in an explicit manner for the development of environment statistics. The main data sources are from existing administrative and survey data, supplementary surveys, and volunteers who regularly perform standardized observations on e.g., the populations of flora and fauna. A close collaboration between the various institutes concerned with the compilation of environmental data has been developed. Environment statistics produced by Statistics Netherlands are published via StatLine and the Environmental Data Compendium on the web and also used to produce indicators and environmental-economic accounts.

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

11. It was generally agreed that the multidisciplinary nature of environment statistics requires a strong cooperation between institutions that provide environment statistics. Regular communication and agreements on data sharing are essential for institutional cooperation. A framework facilitates identifying all data sources and the roles of involved institutions, helps assign corresponding tasks to each institution, and makes it

easier by using common methods and approaches for different institutions to integrate statistics.

12. While there was a general agreement that the revised FDES should address the importance of institutional arrangements in environment statistics, views differed about the appropriate depth of discussing these issues in a conceptual framework which should focus on the conceptual basis for the development of environment statistics. Guidance on how to organize institutional coordination in countries should be part of a document on good practices in environment statistics as institutional arrangements differ from country to country.

13. It was acknowledged that the 1984 FDES was based on and synthesized existing experiences in the countries at that time. The 1984 FDES was a product of its time and many parts of it are still relevant. Instead of introducing a completely new framework, the revision should reflect all existing work and incorporate new developments and emerging issues. The revision should stand the test of time and attract wider audiences. It was also suggested that the revised FDES needed more advocacy when it is finished.

14. It was agreed that the aspects of the state of the environment (particularly its qualitative aspects) are missing or not well developed in official statistics. Many participants emphasized that the focus of environment statistics should be on the state and on the changes of the state of the environment. In this respect diverging views on the boundaries of environment statistics and the roles of national statistical offices in this field of statistics were discussed.

15. There was general agreement that statistical (observation) units are important aspects of environment statistics. While in economic statistics the statistical unit is the establishment (enterprise), the basic units of environment statistics should be physical “environmental” units since environment statistics is based on physical observation with spatial dimensions. Identifying the right unit can help linking environmental information

systems with geographic information systems. Identifying the right attributes is also essential, with different attributes serving different purposes.

Session 2: A Framework for Environment Statistics

16. Session 2 was chaired by Iva Ritchelova and moderated by Michael Nagy and Edgar Ek. The six presentations focused on discussing existing frameworks used in environment statistics and their commonalities, the potential of scientific theories for a conceptual framework, as well as the criteria, approaches and components that could be useful for the revised FDES.

17. The first presentation made by Torstein Bye explored the possibility of finding a common denominator in the various frameworks in the field of environment statistics. He argued that there are considerable similarities among the Pressure-State-Response (PSR) or Driving-force-Pressure-State-Impact-Response (DPSIR) frameworks, environmental-economic accounting, and the capital and ecosystem approaches; and that the differences among those frameworks, systems and approaches lie more in their scope and depth. In the presentation, he also analyzed other relevant initiatives such as GDP and Beyond, the Commission on Sustainable Development (CSD) indicators, the Stiglitz report and the OECD green growth strategy. The review suggested that it would be possible to find a common denominator as the common features between all the frameworks are more obvious than the differences. Nevertheless, it was stated that the point of departure and primary focus of each framework are different, as the frameworks serve different purposes. A framework cannot exist in a vacuum, for its real value is in the relationship between its elements. A framework is a systematic way of organizing the information flow to obtain relevance, accuracy, accessibility, interpretability, quality, coherence, consistency and efficiency in the production of statistics.

18. In his presentation Jean-Louis Weber argued that when using the PSR and DPSIR frameworks countries tended to focus more on the Pressure and the Response than on the State statistics and the use of these frameworks turned rapidly to a hierarchal and

mechanical interpretation. Now that the knowledge is more advanced in the field of environment statistics, it has been realized how difficult it is to attribute causal relations among pressure, state and response. He suggested focusing on the State as the current most important challenge for the FDES and that from ecosystems point of view, the State would be a relation among quantities and health (or distress). It was proposed that, based on these “diagnoses”, Pressure and Response statistics should focus on only those State variables that show the signs of problems.

19. Quantitatively, the State can be described and measured as surface, length, volume, mass or energy; while it can be described qualitatively from multi-criteria diagnosis based on vitality, organization, resilience, dependency, and disease prevalence. Thus, the State of ecosystems can be expressed as quantity weighted by a quality coefficient. The most important advantage of approaching DPSIR via the State of ecosystems is that it could provide a clear base line for identifying any changes (improvement or degradation) of the state.

20. In her presentation, Adriana Oropeza described the process of developing a framework for environment statistics in Mexico, in which different national agencies collaborate. The first step in the process had been to reach agreement on the purpose and scope of environment statistics (characterizing physical and environmental conditions, natural resources and identifying and monitoring environmental change). The framework is related to both environmental and spatial information within the mandate of the INEGI and the collaborating partner agencies. The most important components of the environmental information system and their links to other information systems were described, and a classification of themes and sub themes is currently being developed for each of the components.

21. Robert Smith in his presentation focused on the need for a conceptual framework for environment statistics that is based on a sound scientific theory. Currently, in the absence of such a framework, a variety of ad hoc, explicit or implicit frameworks exist that have led to a patchwork of environment statistics of different levels of quality. The

need is to move towards a more coherent and comprehensive system. A good framework is aligned with the primary purpose of environment statistics; makes the scope of environment statistics clear; defines clear dimensions for environment statistics; leads to consistent definitions and standards; is coherent with other frameworks; and can be used to identify data gaps.

22. About the existing frameworks he remarked that the PSR and its derivatives provide ambiguous guidance for the categorization of the variables according to pressure, state and response and provide no clear boundaries for statistics. A framework based on the theory of natural capital and ecosystem services can provide strong conceptual foundation and clear boundaries. It is consistent with emerging conceptual consensus about the relations between humanity and ecosystems. A conceptual framework based on the natural capital theory would provide a scientific/theoretical foundation for the accompanying statistical framework, the System of Environmental Economic Accounting (SEEA), similar to the Keynesian macroeconomic theory upon which the System of National Accounts as a statistical framework is based.

23. Christian Layke made a presentation about ongoing work at the World Resources Institute on an ecosystem services indicators framework. If statistical systems adopt elements of a framework based on ecosystem service concepts to organize indicators and data, they will enhance the ability of policy analysts to use the approaches being developed around ecosystem service concepts and help identify key environment-human linkages. While the approaches used by statistical systems vary, many statistical systems are organized around frameworks, such as the FDES and DPSIR, both of which lack key elements needed to apply ecosystem service concepts.

24. The ecosystem services indicators framework was developed to be consistent with existing frameworks used by statistical systems, including FDES and DPSIR as well as the Millennium Assessment framework and recently-developed approaches applying ecosystem service concepts in economic valuation of ecosystems and biodiversity. The goal is that the framework elements necessary for applying ecosystem service concepts

can be integrated into existing frameworks being used by statistical agencies. The data then compiled by these agencies in the future will be able to support developing approaches such as economic valuation of ecosystems and biodiversity, ecosystem assessments, modelling of ecosystem services and policy analyses.

25. Kaia Oras discussed in her presentation what ecosystem boundaries have to say about the FDES. She emphasized that ecosystems are very complex entities with many components that are in permanent interaction with each other. The main ideas presented include the idea that ecosystem boundaries and limit factors provide a possible key for operationalizing the ecosystem approach and for better defining the scope of environment statistics. The nine planetary boundaries proposed by the Resilience Alliance (climate change, ocean acidification, ozone depletion, biogeochemical nitrogen and phosphorus cycle, freshwater use, land use change, loss of biodiversity, chemical pollution, and atmospheric aerosol loading) could be analyzed further from the environment statistics perspective. It was also argued that a possible matrix of a revised framework could take the shape of a decision tree depending on the user's point of interest and the availability of the resources to produce statistics.

26. In the last part of Session 2, three country presentations were made. Raymundo Talento described the development of environment statistics in the context of the Philippine statistical system. He also described the mechanisms used in the generation of official statistics, and the working of the inter agency environment statistics committee. He stressed the challenges ahead including the development of a framework to coordinate environment statistics, the necessity of a core set of environmental statistics and the strengthening of institutional linkages.

27. Janet Martin in her presentation described the objective, the phases and the results of a three year environment statistics project in Jamaica that was implemented with the help of Statistics Sweden. She described the areas covered by environment statistics organized according to the PSR framework. The project facilitated setting up institutional

arrangements, producing several publications on environment statistics and identifying critical areas where more work needs to be done.

28. Anand Sookun in his presentation described some of the good practices in the development of environment statistics in Mauritius, such as: the collaboration of the CSO with the line ministry by posting a statistics unit within the ministry where all logistical support is provided; identification of users and definition of user needs for environment statistics through user surveys; adoption of frameworks for environment statistics; facilitation of data producers/suppliers in creating databases and adopting frameworks; active participation of the CSO in national, regional and international projects where available data are used and additional data are produced and experiences are shared; setting up appropriate data sharing mechanisms; making appropriate use of technologies (GIS, Web, etc); ensuring good data quality; and ensuring quality and timely data dissemination.

From the discussion in this session, the most important points were:

29. Participants reinforced the need to revise the FDES. A significant number of experts, particularly from developing countries, insisted on the need for a simple, easy-to-follow FDES that provides guidance for the development of environment statistics and meets an agreed set of criteria. The participants also stressed the necessity for both a core set of statistics and accompanying documents providing practical guidance.

30. There was general agreement about the importance of the State dimension of the framework. The experts discussed that developed countries produce environment statistics that are in general about Pressure, Impact and Response, whereas developing countries tend to focus more on the State (particularly natural resources) statistics. Ideas were discussed on how to go on, and what can be done to integrate the existing inputs into the State dimension, and how to further develop this part. It was also mentioned that the revision of the FDES was a good opportunity to look at the building blocks of the framework that need to be represented.

31. One expert expressed the need to exert caution when thinking about how to develop the many dimensions or facets that are comprised into the State, since the users' demands, in particular those of policy makers, will be better served with a selected and limited number of metrics about the State of the environment.

32. One expert stated that the DPSIR framework could be good for creating strong narrative and that it rings true with the intuition of people. From his point of view, the DPSIR might not work when probed with more rigor and detail, particularly when having to attribute specific environment statistics to the columns of DPSIR. Deciding, for example, between Drivers or Pressures will depend on the objective of the analysis. He suggested that we need to look for a framework that is more robust and coherent, and that the natural capital and ecosystem approaches for developing environment statistics could also be the base upon which the SEEA can rest.

33. Several experts refuted that and said that according to their experience both the PSR and DPSIR frameworks provide clear and useful guidance to most countries. The classification of environmental variables within the columns and rows of the framework require arbitrary decisions, but all classifications do. The combination of the FDES and the PSR frameworks provide clear enough classification and boundaries to their environment statistics work. There is still lack of a superior framework, so the DPSIR, although imperfect, can still serve as a starting point for the revision of the FDES.

34. Some experts expressed that the close match among theoretical and statistical frameworks presented in the economic field around the 1940's can not be achieved as such in the field of environment statistics, for the environmental components and their interactive dynamics are of a particular nature and by far more complex and cross cutting phenomena.

35. It was noted that the proposal of Statistics Canada has shifted from the ecosystem approach presented at the Expert Group Meeting of 2009 to the current proposal founded

more on the concept of natural capital which was felt to be a narrower approach for developing environment statistics. It was also noted that further work has to be done in translating the theory into a framework because without that translation it is not possible to discuss its strengths, weaknesses, applicability and feasibility as a framework for environment statistics.

36. There was also a discussion about the possibility of finding a common denominator among existing frameworks, systems and approaches (PSR, DPSIR, SEEA, etc.) being considered within the FDES revision. There was general consensus about there being many similar aspects or components, which can be thought of as a set of commonalities among the frameworks. It was agreed that these frameworks and approaches offer valuable inputs for the revised FDES.

37. There was agreement to explore the possibilities of incorporating inputs from the ecosystem approach within the revision of the FDES, although this could prove difficult in practical terms.

38. It was mentioned that the lack of a globally agreed general ecosystems classification could make it difficult to translate this approach into a statistical framework to organize the development of environment statistics in a great number of countries. It was pointed out that currently an ecosystem services classification is being developed and going through a process of global consultation.

39. Suggestions were made to include additional criteria that the revised FDES has to satisfy to those presented in the issue papers. On the one hand, it was said that a good framework should be usable by a great number of countries. Other important criteria to be incorporated are that the framework should: help identify a core set of environment statistics; facilitate the identification of data sources; and foster interagency collaboration.

Session 3: Core set of environment statistics

40. Session 3 was chaired by Cesare Costantino and moderated by Torstein Bye and Raymundo Talento. It included five presentations on: lessons learnt through the Montreal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests; the user perspective: important questions to be answered by environment statistics in sustainable crop production intensification; the criteria to use when determining the core set of environment statistics; streamlining environmental indicators; and an analysis of existing indicator sets.

41. Richard Guldin presented his experience in environmental information for national and international reporting in the forest sector. He recommended that for the forest sector in the revised FDES, choosing from the suite of criteria and indicators already in use by the Food and Agriculture Organization of the United Nations (FAO) and regional processes would be a “quick win”. He also noted that the choice of criteria or thematic areas is inherently a *political* one, not a scientific one, and that the choice is best made through broad-based, open and transparent dialogue *with political officials*. He described the main attributes of indicators to be as follows: simple to explain to policy-makers and the general public; relevant to important values; easy to implement consistently across space and time; scalable from global to politically important sub-national levels; affordable, given budgets and technical capacity; supported by a body of science; and effective in screening risks to depict meaningful differences in key values.

42. He also described how building three suites of indicators can create the flexibility countries need to make more effective use of criteria and indicators as follows: “core”- implemented everywhere using the required protocol; “core-optional”- choice of whether to implement or not, but if implemented, then use the required protocol; and “optional”- choice of whether to implement with suggestions on feasible protocols. He mentioned that every indicator also needs a protocol - a set of technical specifications that create consistency and assure comparability over space and time - and a process to manage the protocols. With regard to frameworks, he noted that they can be simple or elaborate,

simple being better, and that no single “ideal” framework exists. He also noted that the main functions of frameworks are to: illustrate central concepts to political interests; and focus scientists and systems thinkers on the “vital few” values and the key indicators. Based on his experience he recommended that the indicator work should start from the state of the environment. Starting from the pressure will result in finger-pointing, build tension instead of cooperation, and manifest a lack of trust among stakeholders.

43. Mike Robson presented crop production intensification as an example of the use of environment statistics. He explained that in order to farm in a sustainable way, farmers needed real time simple robust monitoring tools and adapted knowledge, and that policy makers needed proxies for the state of agro-ecosystem health and an understanding of the impact of agriculture on neighbouring ecosystems. He described the DPSIR framework as a useful tool for analysis and communication of information on crop production.

44. He also described the nature and scale of the indicators. As to the nature of the indicators, it is possible to define three types of economic, social and environmental indicators that can be used to monitor or measure progress in production systems and to track sustainable intensification, and the impact on economic and social conditions: the *uptake of sustainable practices* that is being sought, the *observable impact* resulting from the change in mindset and practices that is being sought, and the *outcome* – the change in the state of the economic, social and environmental conditions of the target group and their area that is being sought. As to the scale, he differentiated between local and aggregate indicators. Aggregate (macro) indicators are needed by policy makers at larger scale. These could include status and trends at regional and national level in soil fertility, water usage (at river basin scale), pesticide consumption patterns (based on data on sale and distribution) and the levels of adoption of effective technologies appropriate to sustainable intensification.

45. Khamis Raddad made a presentation on the criteria to use when determining the core set of environment statistics. He mentioned the following as important criteria:

relevant; measurable and statistically sound; simple and easily understood; cost effective; internationally comparable; timely; reliable; accurate; consistent; coherent; and accessible. Mr. Raddad also explained the dimensions of the core set of environment statistics as follows: geographic dimensions; economic dimensions; subject specific; national and international priority; and topics should be comprehensive and cover both sustainable and performance issues. Finally, he noted that environment statistics should be related with other issues as follows: integrated with other topics; related to the ecosystem approach; closely aligned with international best practices and international conventions; and referring to the environmental-economic accounting approach.

46. Christian Heidorn described the project on “Streamlining of Environmental Indicators” which was initiated due to the large number and diversity of environmental indicators maintained at the European level. Streamlining would mean the following: ensuring that the same indicators have the same name; getting the names of indicators right; using *as far as possible* a common presentation concept for indicators and meta-data (fact-sheets); agreeing on responsibilities and avoiding multiple reporting for the same indicators; eliminating redundant indicators; and making the process and results transparent on the web. He presented the results of the first project from 2007-2008, as well as the current status and expected outputs from the 2010-2011 project.

47. Mr. Heidorn explained that a presentation concept (fact-sheet) was developed with the intention to apply it to all European environmental indicators. Furthermore, an analysis of the indicators with regard to their streamlining (or non-streamlining) potential will be defined. He also said that the focus will be on indicators with a high potential for streamlining, where high potential means the same (or very similar) definition and/or the same data source. He proposed that the revised FDES should facilitate a continuous streamlining and coordination of environmental indicator production among major indicator ‘owners’ at the international level.

48. Branko Milicevic presented the work that UNSD has carried out with regard to the development of a core set of environment statistics. Currently, 34 international and

regional sets of environment statistics/indicators have been reviewed. The environmental dimension of the CSD list of indicators of sustainable development has been used as the reference framework for this exercise for the following reasons: it is comprehensive, not too focused; it is based on an agreed language, perceived as politically neutral; it is relatively recent (2007); it uses a thematic, policy-friendly framework; there is no reference to a PSR framework or any of its derivatives, unlike its previous versions; and it is a good starting point regardless of what approach to defining the revised FDES is taken.

49. Mr. Milicevic noted some of the conclusions to date. The 34 sources provide an extensive bank of indicators. There are other sources the assessment could take into account. There are many duplications and repetitions among the indicators and streamlining is easy in most cases; however, there are different levels of detail, aggregation and scope that complicate such work. Finally, he described the next steps envisaged by UNSD to continue the work: select the most common/relevant/important “core” indicators from the sources; identify the underlying core set of statistics needed to calculate these indicators; refine the core set of statistics based on the criteria of relevance, coverage, measurability, data availability, etc.; and match these statistics with the revised FDES to identify gaps and assess whether they can be filled.

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

50. There was overall support for the work and the process that UNSD has already started in developing a core set of statistics. There was some discussion about what was meant by indicators, versus statistics or variables. It was noted by UNSD that the core set of statistics is about the underlying statistics needed for the compilation of the most common indicators. It was proposed that UNSD compile the list of statistics into a hierarchical classification, where the underlying data items would also be included. There could be a recommended (core) list and a supplementary list of the statistics. One participant noted that there were more detailed, global indicators developed in some areas

such as in forest, water and energy, and that these could also be considered in the assessment.

51. It was agreed that the main objectives of establishing a core set of environment statistics are to give guidance for the development of environment statistics and setting priorities for countries at the early stages of environment statistics, and to foster international comparability by providing detailed methodologies for compilation.

52. With regard to the relationship between the revised FDES and the core set of statistics it was noted that the revised FDES should bring everything together and the core set should be closely tied to the revised FDES. It was also expressed that the revised FDES needs to be an all encompassing framework that includes multi-purpose information, statistics, national and international reporting requirements, and accounts.

Session 4: Outline of the revised FDES

53. As sessions 1-3 did not reach final conclusions on the need for a conceptual framework, on the selection of a scientific theory to underpin the framework and on the scope of environment statistics, the participants agreed that, instead of discussing the outline of the revised framework, all three working groups would focus on the fundamental questions that had to be solved before talking about the detailed contents. A list of questions was developed and adopted by the Expert Group to consider in the three working groups. The working groups were moderated by the moderators of sessions 1-3 respectively.

54. The conclusions of the working group discussions were reported back and discussed further in the plenary part of the session (chaired by Cesare Costantino). The discussions (and conclusions, where relevant) are summarized below.

55. The working groups considered developments in the knowledge about the environment, environmental policy issues and new policy instruments since 1984 as well

as the increasing availability of new technologies in statistics, and their influence on the development of environment statistics. The most important developments were: mainstreaming the concept of sustainable development; better understanding of links between well-being, ecology, economic development and social aspects; the open government and increased involvement of the public; emerging environmental issues (such as climate change, biodiversity, desertification, food security) and the resulting international conventions and agreements with special data requirements; the integration of environmental aspects into sector policies; the appearance of new economic/market instruments to regulate pressures on the environment; the growing need for internationally comparable data; and the unprecedented development of information technology. These developments have to be considered in the revision of the FDES.

56. The objective of environment statistics was established as providing statistical information, to improve policy and decision making, on the state (and changes of the state) of the environment and its links with human well-being, economic and social development.

57. It was agreed that the scope of environment statistics includes ecosystems and natural resources. Environment statistics describe the qualitative and quantitative aspects of ecosystems and natural resources including their interactions with human activities and natural events.

58. Two of the groups agreed that the state (quantity and quality) of the environment and its changes are in the centre of environment statistics. Measuring the pressures on the environment (flows between the environment and the economy) and the impacts of environmental changes on humans create the links with economic and social statistics.

59. The third group gave a broad definition of the scope (everything linked to physical phenomena which have the potential to affect economic and social development) but claimed that a precise definition of the scope is not possible until the theory

underlying the conceptual framework is selected. There was an inconclusive discussion whether the choice of the framework determines the scope or the other way round.

60. The working groups agreed on the following criteria that the revised framework has to satisfy. The framework should:

- Be adaptable, applicable, easy to follow
- Be clearly aligned with the objective of environment statistics
- Make the scope of environment statistics clear
- Make the dimensions of environment statistics clear
- Help organize environment statistics
- Help set up standard classifications and definitions
- Be coherent with other internationally agreed frameworks
- Help identifying data gaps
- Help identifying a core set of statistics
- Facilitate the identification of roles and responsibilities of players
- Represent the state of the art.

61. The working groups agreed that there are several evolving scientific theories but there is not yet consensus on a single overarching theory that encompasses all aspects of and interrelationships in the environment and between the environment and human activities. The majority of the participants were of the opinion that while an agreed scientific theory provides a strong and sound foundation for a conceptual framework, it is not a necessary precondition to begin the process of revising the 1984 FDES. The absence of such an agreed theory should not hinder the commencement of the revision process and the exploration of a core set of environmental statistics that subsequently should be supported by practical guidance documents to help countries develop their statistics.

62. It was decided that UNSD, according to the directions agreed upon by the Expert Group, initiates (i) the revision process of the 1984 FDES and (ii) the identification of a core set of environment statistics, and will invite interested participants to form a

subgroup and assist UNSD in this work. A working paper on the revision and a first draft of the core set of statistics will be presented and discussed at the next meeting of the Expert Group.

63. It was also agreed that the natural capital approach is a known theory and deserves further investigation along with other possibilities as the theoretical underpinning of the conceptual framework. Statistics Canada offered to lead this work with the help of a subgroup with the objective to produce a draft document on a conceptual framework for discussion by the next meeting of the Expert Group, taking into account the existing FDES and the criteria agreed upon by the experts.

ANNEX B



DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

ESA/STATISTICS/AC.228
EGM-FDES/1/2

Expert Group Meeting on the Revision of the Framework
for the Development of Environment Statistics (FDES)
New York, 8-10 November 2010

DC2-23rd floor Conference Room

Organization of Work

Monday, 8 November 2010

Morning session (09:30-13:00)

08:45 – 09:30 Registration (Lobby of 2 UN Plaza)

09:30 – 10:00 Opening of the Meeting
Introductions
Adoption of Agenda
Objective of the Meeting

10:00 – 11:30 Session 1: The Nature of Environment Statistics
(Chapter I of the Revised FDES)

Session 1 will discuss the characteristics of environment statistics such as its objective, scope and coverage, links with economic and social statistics, statistical units and classifications, data sources and institutional aspects. The discussion and agreement on objective, scope and coverage is essential for selecting the adequate framework.

Presentations:

- EGM-FDES/1/11: Challenges in organization of environment statistics (Leo Koltola, Finland)
- EGM-FDES/1/7: The interface between core environmental statistics and other information systems: which interaction is important? The role of sector statistics, environmental monitoring and geographical information systems (Jean-Louis Weber, EEA)

- EGM-FDES/1/13: Data integration in environment statistics (Christian Heidorn, Eurostat)

11:30 – 12:00 Coffee break

12:00 – 13:00 Session 1 (continued)

Presentations:

- EGM-FDES/1/12: The relationship between FDES and the main ways to obtain environmental statistics (Wadih Neto, Brazil)
- EGM-FDES/1/9: Towards a sound data basis for environment statistics: requirements for multiple use of data and institutional cooperation (Michael Nagy and Eva Milota, Austria)
- EGM-FDES/1/10: Institutional dimension of environmental statistics (Rayen Quiroga and Kristina Taboulchanas, ECLAC)

13:00 – 14:00 Lunch break

Afternoon session (14:00 – 18:00)

14:00 – 15:00 Session 1 (continued)

Presentation:

- EGM-FDES/1/8: Statistical units and their classifications in environment statistics (Michael Vardon, Australia)

Discussion and conclusions of Session 1 (chair and moderators)

15:00 – 15:30 Country practices

Presentations:

- EGM-FDES/1/23: Insight into environment statistics: its strengths and weaknesses (Ditshupo Gaobotse, Botswana)
- EGM-FDES/1/24: 40 years of development of environment statistics in the Netherlands (Hendrik Jan Dijkerman, Netherlands)

15:30 – 16:00 Coffee break

**16:00 – 18:00 Session 2: A Framework for Environment Statistics
(Chapters II, III and IV of the Revised FDES)**

Session 2 will concentrate on the framework for environment statistics and the criteria for its selection. The possible approaches to the conceptual basis, the role, objectives and main properties of the framework will be discussed including the identification of the target audience and main users of the revised framework. The session is expected to conclude with an agreement on the recommended approach. Participants will discuss the main dimensions of the framework and their aspects to be measured, and will outline the building blocks and components (statistical topics) of the framework, its structure and tables, and its application to identifying statistical variables and assess data requirements, sources, quality and gaps.

Presentations:

- EGM-FDES/1/15: Frameworks for Environment Statistics – A Common Denominator? (Torstein Bye, Norway)
- EGM-FDES/1/16: Merging the Ecosystem Approach with the Conventional PSR/DPSIR Framework (Jean-Louis Weber, EEA)
- EGM-FDES/1/28: A Framework for Environmental Information (Adriana Oropeza Lliteras, Mexico)

18:00 - 19:30 Reception (DC2-14th floor)

Tuesday, 9 November 2010

Morning session (09:00 – 13:00)

09:00 – 11:00 Session 2 (continued)

Presentations:

- EGM-FDES/1/14: Criteria for a conceptual framework for developing environment statistics (Rob Smith and Michael Bordt, Canada)
- EGM-FDES/1/21: Integrating Ecosystem Service concepts into the Framework for Development of Environmental Statistics (Christian Layke, World Resources Institute)
- EGM-FDES/1/17: What Do the Ecosystem Boundaries Have to Say to the FDES? (Kaia Oras, Estonia)

11:00 – 11:30 Coffee break

11:30 – 12:30 Discussion and conclusions of Session 2 (chair and moderators)

12:30 – 13:00 Country practices

Presentations:

- EGM-FDES/1/25: Philippine practices in developing environment statistics (Raymundo Talento, Philippines)
- EGM-FDES/1/26: The Framework for Developing Environment Statistics in Jamaica (Janet Martin, Jamaica)

13:00 – 14:00 Lunch break

Afternoon session (14:00 – 18:00)

14:00 – 16:00 Session 3: Core Set of Environment Statistics (Chapter V of the Revised FDES)

The core set of environment statistics will be recommended as a starting point to develop or prioritize environment statistics at the national level and for global (international) collection of comparable data. Session 3 will discuss the process leading to, and the criteria to use for identification of an agreed core set of environment statistics on the basis of the statistical topics of the Framework.

Presentations:

- EGM-FDES/1/20: Lessons learned through the Montréal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (Richard Guldin, USA)
- EGM-FDES/1/29: The user perspective: Important questions to be answered by environment statistics in sustainable crop production intensification (Mike Robson, FAO)
- EGM-FDES/1/19: The Criteria to Use When Determining the Core Set of Environment Statistics (Khamis Raddad, United Arab Emirates)

16:00 – 16:30 Coffee break

16:30 – 18:00 Session 3 (continued)

Presentations:

- EGM-FDES/1/22: Streamlining environmental indicators (Christian Heidorn, Eurostat)
- EGM-FDES/1/30: An analysis of existing indicator sets (UNSD)

Discussion and conclusions of Session 3 (chair and moderators)

Wednesday, 10 November 2010

Morning session (09:00 – 13:00)

09:00 – 12:30 Session 4: Outline of the Revised FDES (Working Groups)

Session 4 will break out to three parallel sessions, in which participants will agree, based on the conclusions of Sessions 1-3, on the detailed annotated outline of the revised FDES and the distribution of work

Working Group 1: Outline and work programme for Chapter I: The nature of environment statistics

Working Group 2: Outline and work programme for Chapter II: The framework and its conceptual basis; Chapter III: Main dimensions and components of the framework; and Chapter IV: Links with other frameworks and analytical models

Working Group 3: Outline and work programme for Chapter V: Core set of statistics, and Annexes

11:00 – 11:30 Coffee break

Plenary: The conclusions of the breakout groups will be presented by their respective chairs/moderators at a plenary session.

12:30 – 13:00 Country practices

Presentations:

- EGM-FDES/1/27: Good practices in Environment Statistics – the example of Mauritius (Anand Sookun, Mauritius)

13:00 - 14:00 Lunch break

Afternoon session (14:00 – 16:15)

14:00 – 16:00 Session 5: Programme of Work and Conclusions

Session V will discuss practical matters such as the Terms of Reference of the Expert Group and its programme of work for 2011, expected outputs and the timetable, distribution of work and responsibilities. It will adopt the conclusions of the meeting which will be reported to the 42nd session of the Statistical Commission.

16:00 – 16:15 Evaluation and closing of the meeting

ANNEX C



DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

ESA/STATISTICS/AC.228
EGM-FDES/1/3

**Expert Group Meeting on the Revision of the Framework
for the Development of Environment Statistics (FDES)
New York, 8-10 November 2010**

List of Participants

AUSTRALIA

Mr. Michael VARDON
Director
Centre of Environment and Energy Statistics
Australian Bureau of Statistics
ABS House
45 Benjamin Way
Belconnen ACT 2617
Australia
Tel: +61 (0)2 6252 7348
Mobile: +61 (0)447 825351
E-mail: michael.vardon@abs.gov.au

BELIZE

Mr. Edgar EK
Deputy Chief Environmental Officer
Department of the Environment
Government of Belize
10/12 Ambergris Ave
Belmopan
Belize
Tel: +501 822 2816
Fax: +501 822 2862
E-mail: envirodept@btl.net
Edgar_ek@yahoo.com

AUSTRIA

Mr. Michael NAGY
Head of Department
Environment Agency Austria
Spittelauer Lände 5
1090 Vienna
Austria
Tel: +43 1 31304 3490
Fax: +43 1 31304 3533
E-mail: Michael.nagy@umweltbundesamt.at

BOTSWANA

Ms. Ditshupo GAOBOTSE
Central Statistics Office
Private Bag 0024
Gaborone
Botswana
Tel: +267 367 1300
Fax: +267 3 952 201
Email: Dgaobotse@gov.bw,
tshupsa@yahoo.com

BRAZIL

Mr. Wadih NETO
Assistant Director Geosciences
Brazilian Institute of Geography and
Statistics
Av. República do Chile, 500, 12^o andar
20031-170 – Centro – Rio de Janeiro
Brazil
Tel: +55 21 21424666
Fax: +55 21 21420005
E-mail: wadih.neto@ibge.gov.br

CANADA

Mr. Robert SMITH
Director
Environment Accounts and Statistics
Division
Statistics Canada
7th floor, R.H. Coats Bldg
Ottawa, Ontario K1A 0T6
Canada
Tel: +613 951-2810
Fax: +613 951-0634
E-mail: Robert.B.Smith@statcan.gc.ca

CZECH REPUBLIC

Ms. Iva RITSCHELOVA
President
Czech Statistical Office
Na padesatem 81
100 82 Prague 10
Czech Republic
Phone: +420 2 7405-2411
Fax: +420 2 7405-2133
E-mail: Iva.Ritschelova@czso.cz,
predsedkyne@czso.cz

ESTONIA

Ms. Kaia ORAS
Head of Environment and Sustainable
Development Statistics Section,
Statistical Office of Estonia
15 Endla Street
TALLIN EE0100
Estonia
Tel: +3726259234
E-mail kaia.oras@stat.ee

FINLAND

Mr. Leo KOLTTOLA
Senior Adviser Environment and Energy
FI-00022 Statistics Finland
Finland
Tel: +358 9 17343234
Fax: +358 9 17343429
E-mail: leo.kolttola@stat.fi

INDIA

Ms. Sekhar JEYALAKSHMI
Additional Director General
Ministry of Statistics and Programme
Implementation
Central Statistical Office, Social Statistics
Division
West Block-8, Wing-6, R. K. Puram Sector 1
New Delhi-110066
India
Tel: +91 11 26108529
Fax: +91 11 26108529
E-mail: adg-ssd-mospi@nic.in,
jeyassekhar@yahoo.co.in

ITALY

Mr. Cesare COSTANTINO
Coordinator for Environmental Accounting
Director National Accounts
National Institute of Statistics
Via Cesare Balbo 16
00186 Rome
Italy
Tel: + 39 6 4673 7255
E-mail: cecostan@istat.it

JAMAICA

Ms. Janet GEOGHAGEN-MARTIN
Manager, Environment Statistics Unit
Statistical Institute of Jamaica
7 Cecelio Avenue,
Kingston 10
Jamaica
Tel: (876) 926-5311, Ext. 1120
Fax: (876) 926-1138
E-mail: sesu@statinja.gov.jm

MAURITIUS

Mr. Anand SOOKUN
Statistician, Environment and Energy
Central Statistics Office
Life Insurance Corporation of India Centre
John Kennedy Street
Port Louis
Mauritius
Email: asookun@mail.gov.mu

MEXICO

Ms. Adriana Oropeza LLITERAS
Instituto Nacional de
Estadística y Geografía (INEGI)
Av. Héroe de Nacozari 2301
Puerta 7 - Segundo Nivel
Frac. Jardines del Parque
C.P. 20276
Aguascalientes, Ags.,
México
Tel: +52 55 52781087
Email: adriana.oropeza@inegi.org.mx

NETHERLANDS

Mr. Hendrik Jan DIJKERMAN
Head, Energy Statistics
Statistics Netherlands
Postbus 24500
2490 HA The Hague
The Netherlands
Tel: +31 70 337 4878
E-mail: hdkn@cbs.nl

NIGERIA

Mr. Philip Olatunde BANKOLE
Federal Ministry of Environment, Nigeria
Assistant Director (Statistics & Information
Management)
Abuja
Nigeria
Tel: +234 8037260542
E-mail: philip_olab@yahoo.com

NORWAY

Mr. Torstein Arne BYE
Director of Economics, Energy and
Environment
Statistics Norway
P.O. Box 8131 Dep. NO-0033 Oslo
Norway
Tel: +47 2 1094944
Cell: +47 9 5769491
Fax: +47 2 1094996
E-mail: tab@ssb.no

PHILIPPINES

Mr. Raymundo TALENTO
Director IV
National Statistical Coordination Board
2/F Midland Buendia Bldg.,
403 Gil Puyat Ave. Makati City
Philippines
Tel: +63 2 895 24 81
Fax: +63 2 895 24 81
E-mail: rj.talento@nscb.gov.ph
rjtalento@yahoo.com

SURINAME

Mr. Andreas TALEA
Manager Economic Statistics and
Environment
General Bureau of Statistics
P.O. Box 244
Klipstenestraat 5
Paramaribo
Suriname
Email: anrotalea@gmail.com

UNITED ARAB EMIRATES

Mr. Khamis RADDAD
Acting Director of Agr. and
Environment Dep.
National Bureau of Statistics
Mohemal Ibn Zayed City
P. O. Box 93000
Abu Dhabi
United Arab Emirates
Tel: +971 50 325 3164
Fax: +971 2 6276456
E-mail: khamisrd@hotmail.com

UNITED STATES

Mr. Richard W. GULDIN
Director, Quantitative Sciences
USDA Forest Service, Research &
Development
1601 North Kent Street, 4th Floor;
Arlington, VA 22209-2105
Postal Service Address:
1400 Independence Ave., S.W.
Washington, DC 20250-1120
USA
Tel: 703.605.4177
Cell: 703.201.7829
Fax: 703.605.5131
E-mail: rguldin@fs.fed.us

INTERNATIONAL ORGANIZATIONS

EUROPEAN ENVIRONMENT AGENCY

Mr. Jean-Louis WEBER
Senior Adviser
European Environment Agency
Kongens Nytorv 6
DK-1050 Copenhagen K
Denmark
Tel: +45 3336 7245
Fax: +45 3336 7293
E-mail: jean-louis.weber@eea.europa.eu

EUROSTAT

Mr. Christian HEIDORN
Senior Statistician - Environment Statistics
European Commission - Eurostat
Office: BECH C2-617
L-2920 Luxembourg
Tel.: +352.4301-35271
E-mail: Christian.Heidorn@ec.europa.eu

FAO

Mr. Mike ROBSON
Senior Officer, Information Systems
Plant Production and Protection Division
Food and Agricultural Organization of the
United Nations
Viale delle Terme di Caracalla
00100 Rome
Italy
Tel: +39-06-570-54431
Fax: +39-06-570-53369
E-mail: mike.robson@fao.org

UN DESA DPAD

Mr. Matthias BRUCKNER
Development Policy and Analysis Division
Department for Economic and Social Affairs
United Nations
UN Plaza, DC2-2082
New York, NY 10017
USA
Tel: +1 212-963-2137
E-mail: brucknerm@un.org

UN ECLAC

Ms. Kristina TABOULCHANAS
Coordinator Environmental Statistics
Statistics Division
UN ECLAC
Av Dag Hammarskjold 3477
Vitacura, Santiago
Chile
Phone: 562 210 2335
Fax: 562 210 2472
E-mail: kristina.taboulchanas@cepal.org

UN ECA

Mr. Jeremy WEBB
Statistician
African Climate Policy Centre (ACPC)
UN ECA
Menelik II Avenue
P. O. Box 3001
Addis Ababa
Ethiopia
E-mail: jwebb@uneca.org

UN COMMITTEE OF EXPERTS ON
ENVIRONMENTAL-ECONOMIC
ACCOUNTING

Mr. Peter HARPER
Deputy Australian Statistician
Australian Bureau of Statistics
ABS House, 45 Benjamin Way
Locked bag 10 Belconnen
ACT 2616
Australia
Tel: + 61 2 6252 5841
E-mail: peter.harper@abs.gov.au

**NON-GOVERNMENTAL
ORGANIZATIONS**

Mr. Christian Layke
Senior Associate
People and Ecosystems Program
World Resources Institute
10 G Street, NE (Suite 800)
Washington, DC 20002 USA
Tel: + 1-202-729-7764
Fax: + 1-202-729-7775
E-mail: CLayke@wri.org

**UNITED NATIONS STATISTICS
DIVISION**

**ENVIRONMENT AND ENERGY
STATISTICS BRANCH**

Ms. Eszter Horvath
Chief
2 United Nations Plaza
Room DC2-1418
New York, N. Y. 10017
Tel.: + 1-212-963-4581
Fax: + 1-212-963-0623
E-mail: horvath@un.org

Ms. Reena Shah
Chief
Environment Statistics Section
2 United Nations Plaza
Room DC2-1416
New York, N. Y. 10017
Tel.: + 1-212-963-4586
Fax: + 1-212-963-0623
E-mail: shahr@un.org

Ms. Rayen Quiroga
Statistician
Environment Statistics Section
2 United Nations Plaza
Room DC2-1412
New York, N. Y. 10017
Tel.: + 1-917-367-4201
Fax: + 1-212-963-0623
E-mail: quirogar@un.org

Mr. Branko Milicevic
Statistician
Environment Statistics Section
2 United Nations Plaza
Room DC2-1410
New York, N. Y. 10017
Tel.: + 1-212-963-3901
Fax: + 1-212-963-0623
E-mail: milicevicb@un.org

Ms. Yongyi Min
Statistician
Environment Statistics Section
2 United Nations Plaza
Room DC2-1404
New York, N. Y. 10017
Tel.: + 1-212-963-9296
Fax: + 1-212-963-0623
E-mail: min3@un.org

Ms. Robin Carrington
Statistical Assistant
Environment Statistics Section
2 United Nations Plaza
Room DC2-1403A
New York, N. Y. 10017
Tel.: + 1-212-963-6234
Fax: + 1-212-963-0623
E-mail: carrington@un.org

Ms. Evelyne Michaud
Staff Assistant
Environment, Energy and Industry
Statistics Section
2 United Nations Plaza
Room DC2-1417
New York, N. Y. 10017
Tel.: + 1-212-963-3184
Fax: + 1-212-963-0623
E-mail: michaude@un.org

ECONOMIC STATISTICS BRANCH

Ms. Alessandra Alfieri
Chief
Environmental Economic Accounts Section
2 United Nations Plaza
Room DC2-1518
New York, N. Y. 10017
Tel.: + 1-212-963-4590
Fax: + 1-212-963-1374
E-mail: alfieri@un.org

Mr. Martinez-Lagunes
Inter-Regional Adviser
Environmental Economic Accounts Section
2 United Nations Plaza
Room DC2-1526
New York, N. Y. 10017
Tel.: + 1-917-367-2821
Fax: + 1-212-963-1374
E-mail: martinezr@un.org

Mr. Daniel Clarke
Associate Statistician
Environmental Economic Accounts Section
2 United Nations Plaza
Room DC2-1524
New York, N. Y. 10017
Tel.: + 1-212-367-7048
Fax: + 1-212-963-1374
E-mail: clarke@un.org