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Report of the Australian Bureau of Statistics on Climate Change and Official Statistics

Note by the Secretary-General

In accordance with a request of the Statistical Commission at its thirty-ninth session (E/2008/24), the Secretary-General has the honour to transmit the report of the Australian Bureau of Statistics, containing a programme review of climate change and official statistics. Based on a wide consultation process, it presents a review and analysis of users' needs and challenges. It explores the areas where official statistics can provide input and added value to the analysis of the environmental, social and economic aspects of climate change and the related adaptation and mitigation measures. It makes specific recommendations to mainstream climate change in official statistics both at the national and international levels. The Commission may wish to express its views on the substance of the report and the recommendations for future work in this area.

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I. Mandate and background

1. Authoritative scientific evidence and recent climate events have elevated the issue of climate change high up in the political agenda. There is now a broad agreement that economic and social pressures have contributed to climate change and that climate change has the potential to significantly impact the environment, the economy and the society. It is one of the many duties of the national statistical offices to support the measurement and analysis of the drivers behind, and the social, economic and environmental consequences of, climate change and related mitigation and adaptation measures, and thus better support informed policy- and decision-making.

2. The Statistical Commission at its thirty-ninth session had asked for a review on how official statistics can better contribute to the climate change debate. To meet that request, the Australian Bureau of Statistics was invited by the United Nations Statistics Division to carry out the review.

3. It should be noted that this review is different from previous programme reviews discussed by the Statistical Commission because it relates to an issue rather than to a particular field of statistics. Statistics relevant to and necessary for the understanding of the causes and impacts of climate change and related measures cut across several, if not most, areas of official statistics. The international official statistics community presently engages the issues of climate change in an unsystematic manner. At the national level engagement varies between countries. A small number of countries engage actively, some others occasionally or on the margin, and the majority not at all. Nevertheless, national statistical offices have an important role to play in providing statistical information for climate change-related monitoring and analysis, and there are many existing official statistics that have the potential to be used in this way. There are also gaps that the official statistical community has to fill, and there are areas where national statistical offices can work with others to fill these gaps. There is also work to be done internationally to ensure that standards and methodologies best support climate change analysis, as well as in engaging with relevant international policy bodies on their statistical needs.

4. These matters were discussed at the Conference on Climate Change and Official Statistics held in Oslo, from 14 to 16 April 2008. The Conference was attended by 115 participants, representing 55 countries and 15 international organizations. The Conference agreed that there should be an agenda for action to increase the use of official statistics for climate change policy and monitoring. However, it noted that the growth of environment and climate change-related statistics has to be organic; countries must feel the need and have the will to develop these statistics albeit with the support of others to help develop capabilities. The United Nations Statistical Commission should encourage the national statistical offices' involvement in climate change-related statistics by providing guidance. A global statistical programme of action that allows for the differing capacities of national statistical offices should develop through the consultation process within the global official statistics community and with global and national users of official statistics.

5. The draft agenda for action that was developed during and following the Oslo Conference formed the starting point for the recommendations contained in this review. Since the Oslo Conference there have been subsequent discussions on the

recommendations among conference participants, within the United Nations Statistics Division, by the Committee of Experts on Environmental-Economic Accounting and at the Conference on Climate Change, Development and Official Statistics in the Asia Pacific Region, held in Seoul, in December 2008. While the present recommendations were significantly informed by the consultations, they are the views of the programme reviewer and, as such, are put forward to the Commission on that basis for its consideration.

6. The review is structured as follows. Section II of the report describes the objective of the programme review. Section III introduces the scientific and policy framework and related data needs. Section IV discusses the role of official statistics in the context of climate change. The core of the review is section V, where user needs are discussed and recommendations to meet these needs are proposed. Section VI discusses coordination and governance. A summary of the recommendations is given in section VII. The actions need to be prioritized and timelines assigned. Some views on this are provided in section VIII. The review concludes with points for discussion in section IX.

II. Objective of the programme review

7. The objective of this review is to specify how official statistics may be used for climate change-related measurement and analysis and to identify recommendations and actions to mainstream the climate change aspect in official statistics, thus strengthening the role of official statistics and national statistical offices in this area. This includes more proactive engagement of national statistical offices in providing statistical services for climate change-related policy- and decision-making at the national level, as well as greater engagement of the international statistical community with international climate change activities. To achieve this objective, a programme of action to support the global statistical effort on climate change and to enhance national capacity is needed.

III. Scientific and policy framework

8. The World Meteorological Organization and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change in 1988. The Panel is a scientific body: the information it provides is based on scientific evidence and reflects existing viewpoints within the scientific community. The Panel produces periodic assessment reports on scientific information relevant to human-induced climate change, the impacts of human-induced climate change, and options for adaptation and mitigation. These assessments rely heavily on climate change models that are very data dependent, particularly in areas such as population and economic growth and energy use.

9. The findings of the First Assessment Report of the Intergovernmental Panel on Climate Change (1990) played a decisive role in leading to the United Nations Framework Convention on Climate Change (UNFCCC), which was opened for signature at the United Nations Conference on Environment and Development (Earth Summit) in Rio de Janeiro in 1992, entered into force in 1994 and today enjoys near universal membership, with 192 countries having ratified. It provides the overall policy framework for addressing the climate change issue.

10. UNFCCC is an international environmental treaty aimed at stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Under the Convention Governments gather and share information on greenhouse gas emissions, national policies and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

11. The Convention as originally framed set no mandatory limits on greenhouse gas emissions for individual nations and contained no enforcement provisions; it is therefore considered legally non-binding. Rather, the treaty included provisions for updates (called "protocols") that would set mandatory emission limits. The principal update is the Kyoto Protocol. The Kyoto Protocol establishes legally binding commitments for the reduction of four greenhouse gases (carbon dioxide, methane, nitrous oxide, sulfur hexafluoride) and two groups of gases (hydrofluorocarbons and perfluorocarbons) produced by "Annex I" (industrialized) nations, as well as general commitments for all member countries. The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997, and entered into force on 16 February 2005. To date, 183 Parties of the Convention have ratified its Protocol.

12. Under the Convention, countries must meet their targets primarily through national measures. However, the Kyoto Protocol offers them an additional means of meeting their targets by way of three market-based mechanisms: emissions trading, the clean development mechanism and joint implementation.

13. The Parties to the Convention agreed at the United Nations Climate Change Conference, held in Bali in December 2007, to step up international efforts to combat climate change and lay down measures and obligations for the world after the first commitment period of the Kyoto Protocol expires at the end of 2012. They decided on both the timeline and the main elements of a stronger climate change deal, including a shared long-term vision and enhanced action on the four building blocks: mitigation, adaptation, technology transfer and financing.

14. Mitigation refers to measures that reduce greenhouse gas emissions in an effort to slow down the climate change process. It is a human intervention to reduce the sources or enhance the sinks of greenhouse gases. The Panel identified the main sectors of mitigation as energy supply, transport, buildings, industry, agriculture, forestry and waste management. The effectiveness of the mitigation measures is expressed in the reduction of emissions. Accurate, consistent and internationally comparable data on greenhouse gas emissions is essential for the international community to take the most appropriate action to mitigate climate change. Greenhouse gas emissions are calculated from a wide array of detailed activity statistics with the help of emission coefficients.

15. Adaptation is adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. By including adaptation in the Bali process, politicians recognized that it will not be possible to reverse the ongoing global warming process, and that it will be necessary to take steps to reduce the impacts of climate change on the world population, and to monitor the effectiveness of such steps. Statistics can help identify areas where the economic and social impacts of climate

change might be most significant, as well as the economic and social impacts of the adaptive measures taken.

16. Technology transfer is a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change among different stakeholders. It is identified as an important tool for all countries and in particular for less developed countries or countries most at risk from climate change by providing them with the best available technologies to help them reduce greenhouse gas emissions and to adapt to the effects of climate change. Some of this technology transfer can be tracked by statistics, as can the effects of such transfers.

17. For future long-term cooperation to address climate change, developing country Parties will need considerable financial assistance for mitigation, adaptation and technology transfer. They will therefore need to assess the current arrangements for financial assistance under the Convention and its Kyoto Protocol, as well as options in the current negotiations on additional international investment and financial flows to address climate change. Donors will need information to help them best target the use of the funds. Statistics has to play a role in this.

18. With regard to national reporting obligations under the Convention, UNFCCC draws upon the work of the Intergovernmental Panel on Climate Change. All parties to the Convention are to develop, periodically update, publish and make available national greenhouse gas emission inventories using comparable methodologies developed by the Panel. The inventories are reviewed regularly. It is mandatory for Annex I countries to report annually. The non-Annex I countries are encouraged to use the good practice guidelines of the Panel and are expected to provide reports for specified years. All parties to the Convention submit periodic national communications to UNFCCC, which, in addition to the greenhouse gas emission estimates, include the assessment of impacts and vulnerability, and information on mitigation and adaptation measures.

IV. Role of official statistics in the context of climate change

19. The main functions of official statistics are to provide high quality statistics for the different users; develop, maintain and promulgate statistical standards; and produce integrated statistics. These functions are interrelated: data collected and aggregated on the basis of adequate statistical standards can be integrated, with classifications forming the backbone.

20. In the context of climate change, this suggests the following roles for official statistics:

(a) To provide the best available data for use in climate change assessment, policy- and decision-making, including relevant statistical data for input into greenhouse gas emission inventories and climate change models;

(b) To ensure that climate change aspects are considered in the development and maintenance of statistical standards and that these standards are promulgated outside official statistics;

(c) To develop and advocate statistical tools for the integration of economic, social and environmental information to support the analysis of the causes and impacts of climate change and related policy measures.

21. At present, most national statistical offices are passive contributors, although many statistics produced by official statistics for other purposes are relevant to climate change analysis. National statistical offices need to work with their users to identify how official statistics can best make a contribution, either by making better use of existing statistics or identifying the gaps and the ways to fill them.

22. There are social, economic and environmental aspects to climate change and all need to be considered. They are linked and statistical tools are needed to provide these links. Measurement of the extent and direct impact of climate change is largely based on sources outside the official statistical system. They include meteorological and hydrological information, different physical environmental data and data from scientific research. In order to assess the impacts of climate change and the consequent adaptation and mitigation measures, however, this information has to be linked with existing statistics on the population, on human/economic activities and on the environment to enable impacts on the economy, the society and the natural environment to be assessed.

V. Recommendations on strengthening the role of official statistics in climate change policy- and decision-making

A. Mainstreaming the climate change dimension in official statistics

23. The climate change dimension should be mainstreamed in official statistics and the capability of countries to produce high quality basic statistics for climate change analysis following standard concepts and classifications should be strengthened. This means that sectoral statistics have to be reviewed taking into account the requirements of climate change-related reporting and analysis, and we have to assess whether our statistical standards (concepts, methods, classifications, data items and tabulations) require modifications.

24. This work should be built into the work programme of the Statistical Commission and carried out as an integral part of the ongoing and future revisions of the different sectoral statistical programmes, standards and classifications and as part of the programme on capacity-building.

25. Priorities have to be established on the basis of the relevance and significance of the statistical area in climate change policy- and decision-making. Owing to the important role of land use, land use changes and forestry in greenhouse gas emission, mitigation and adaptation, high priority should be given to land use/land cover statistics, including the development of a standard international land use/land cover classification and its use in spatial analysis.

26. Another priority area is energy statistics. The Oslo Group and the Intersecretariat Working Group on Energy Statistics are working on this and, together with the Statistics Division, they are preparing the new international recommendations for energy statistics and the forthcoming Energy Statistics Compilers Manual, with a view to improving official energy statistics. This work takes into account the requirements of emission inventories and other climate change-related aspects of energy statistics.

Recommendation 1
Ensure that relevant international statistical standards and classifications give proper attention to climate change issues, with particular focus on land use/land cover and energy statistics.

B. Strengthening the role of official statistics in the compilation of the national greenhouse gas emission inventories

27. Reliable emission estimates are the key in designing and monitoring mitigation measures. Emissions of greenhouse gases are calculated or estimated on the basis of detailed activity data with the help of emission factors. As these calculations require a large amount of official statistics, national statistical offices should be involved in the process (a) to understand better the special needs for statistics; and (b) to make the other players (environmental ministries, research institutes, etc.) better understand the role of statistical standards, classifications and the advantage and added value of their use.

28. The greenhouse gas emission inventory methodology identifies the statistics that are needed for the emission calculations. An assessment of the availability of these statistics has to be made. When considering economic activities that impact greenhouse gas emissions, it is useful to look separately at statistics on basic activities such as energy supply, production of industrial commodities, agriculture, forestry, transport, international trade, land use, the management of waste water and wastes, etc. Detailed statistics on physical flows in these activities are needed for development of accurate greenhouse gas emission inventories. Based on this assessment, recommendations can be developed, in agreement with those responsible for the individual statistical areas, to improve the availability of the data needed for the national greenhouse gas emission inventories.

29. Meeting the needs of emission inventories requires cooperation throughout the statistical system and strong engagement with the users. It also requires the contributing statistics to be compiled in accordance with statistical standards that also meet the need of emission inventories and other purposes. Some revisions to statistical standards may also be required to support the methodology.

30. The role of official statistics in emission inventories will differ from country to country; however, in most cases the role of national statistical offices and official statistics will be to deliver basic activity data (or part of it) for the emission calculations. In some cases they may go a step further and undertake the emission calculations at least for those related to the production and use of energy. There are a few national statistical offices that are responsible for compilation of the whole inventory. The specific role of the national statistical office will depend on the institutional setting in the country concerned. Whatever is the case, the statisticians doing this work must have a basic understanding of the concepts and methods of emission inventories as established by the Intergovernmental Panel on Climate Change and prescribed for national reporting to UNFCCC.

31. The Oslo Conference felt that there was potential for the national statistical office to play a greater role in the estimation of greenhouse gas emissions in most countries. Where national statistical offices have played a significant role, easy access to the data and statistical expertise and the existence of quality principles have been a great advantage in compiling high quality greenhouse gas emission

inventories. To enhance their role, the most important requirement is improved engagement at national level with those responsible for the compilation of emission inventories. There may be a need to prepare guidelines for national statistical offices on how they might be involved in the preparation of emission inventories. Any guidelines should be prepared in collaboration with UNFCCC (and the Intergovernmental Panel on Climate Change where relevant), as should any technical assistance and training programmes.

32. In summary, national statistical offices and other official statistics need to understand the emission statistics and how they are calculated. They have to understand the special needs for sectoral statistics such as energy, transport, industry, agriculture, forestry, land use, waste and other statistics and ensure that basic statistics are established in such a way that they can be used for multiple purposes, including emission inventories. On the other hand, classification differences between the Intergovernmental Panel on Climate Change guidelines and official statistics have to be bridged to link emissions to the economic activities that produced them and thus facilitate the integrated analysis of emission and economic data that is essential for designing and monitoring mitigation measures.

Recommendation 2
Strengthen the role of national statistical offices in the compilation of greenhouse gas inventories and improve the quality of greenhouse gas emission statistics as part of official statistics. Set up a working group with UNFCC to look into emission statistics and related classifications:

(a) **The availability, quality and timeliness of greenhouse gas emission estimates should be improved through the provision of high quality official statistics for the calculations. Basic activity statistics have to be assessed, and areas for improvement identified;**

(b) **The role of official statistics and the national statistical offices in the production of emission inventories should be strengthened;**

(c) **In view of their importance to national policy, statistics on emissions should become part of the regular production and dissemination process of official statistics at the national level with appropriate institutional arrangements, even if the national statistical offices are not the formal reporting agency to UNFCCC or the publisher at the national level;**

(d) **It is proposed that the Statistical Commission set up a working group to look into these issues and, in particular, how to best develop the knowledge base of national statistical offices in this area, especially in developing countries. Collaboration with UNFCCC, particularly with regard to harmonization of classifications, is essential.**

C. Developing statistics on measures of mitigation, adaptation and their supporting mechanisms

33. The monitoring of mitigation measures and the use of the UNFCCC and Kyoto funds and mechanisms by countries and especially the monitoring of technology transfer create new demands for statistics, classifications and integration

frameworks that are capable also of assessing the impacts of these measures on the society, the economy and the environment.

34. To monitor the funds and mechanisms for the countries to use there is a requirement for setting up registration systems and reporting on each activity that uses these funds or mechanisms. This gives a good opportunity to establish the collection of a set of well selected statistics that give a clear picture, both in physical and monetary terms, of the countries' efforts to combat climate change.

35. Emission trading schemes are one of the more important economic tools being considered by Governments. To allocate permits and to assess the effectiveness of mitigation measures requires very high quality greenhouse gas emission estimates that can be linked to the economic activities with appropriate disaggregation.

36. There is an important role for statistical offices in understanding how the different economic activities, the international trade and the consumption of products and services contribute to the greenhouse gas emissions. This requires advanced analysis of standard tools such as the input-output tables or energy supply and use tables, the existence of which is the prerequisite to the analysis.

37. Understanding of the sources of greenhouse gases by sector and industry is critical. This information is a key input into emission trading schemes. The source of information to support models is usually national statistical offices.

38. Emission trading will have an impact on important statistics such as national accounts and other macro-economic statistics, such as the balance of payments. The current revision of the System of National Accounts has taken account of emission trading schemes, but this work was done largely in the absence of actual schemes. As a number of these schemes are implemented now, it should be reviewed whether the proposed treatment requires amplification.

39. Emission trading is just one of the mechanisms that supports mitigation strategies. There are many others being considered by countries. Furthermore, adaptation to climate change is another important response. For many developing countries this is the major consideration, as their contribution to greenhouse gases is minor on the global scale. The System of Integrated Environmental-Economic Accounting is a useful tool for monitoring, measuring and analysing the relationship between climate change policies and the economy by providing consistent time series of data, tables and accounts from which indicators can be derived and models can be built to assess fiscal, price and monetary instruments and regulations for climate change policies.

40. It is recommended therefore to move forward urgently the further development and implementation of SEEA as an international statistical standard, taking into account the requirements for climate change-related statistics and analysis in the revision of SEEA 2003 towards an international statistical standard. It is a framework that has considerable potential to add value in many areas of environmental-economic analysis and is a most practical way forward. The highest priority areas for development and application of SEEA, from the perspective of climate change, need to be determined. Other aspects of SEEA are outside the terms of reference for this review.

41. Environmental-economic accounts cannot be compiled unless the basic data are available. The required basic statistics, especially in the environmental field,

need to be identified and strengthened where necessary. There is an increasing requirement for the development of simple statistical tools for countries with less developed statistical systems and resources. A stepwise approach and the development of simplified standard accounting tables that many countries can implement should be an early initiative.

42. The following recommendations are related to recommendation 2 and paragraphs 33-40 above.

Recommendation 3
Develop new statistics and share best practices on advanced analysis of existing statistics to support mitigation mechanisms and measures.

Recommendation 4
Ensure that key macroeconomic statistics take into account the implications of emission trading schemes and other mitigation mechanisms:

(a) **The implications of emission trading schemes and other mitigation mechanisms for the national accounts and other key macroeconomic statistics should be assessed. The Intersecretariat Working Group on National Accounts should review the implications of existing and prospective emission trading schemes and other mitigation mechanisms and whether any adjustments to the System of National Accounts or explanatory material are needed. These adjustments should flow through to other macroeconomic standards as necessary;**

(b) **The statistical standards and classifications associated with funds and mechanisms (such as the Government Finance Statistics classification) should be reviewed.**

Recommendation 5
Develop further and implement the System of Environmental-Economic Accounting with a focus on its applications to support climate change-related analysis. The United Nations Statistics Division should develop further and implement the System of Integrated Environmental-Economic Accounting as an international statistical standard. The areas for development in SEEA to support climate change analysis need to be identified. This should be a priority of the United Nations Committee of Experts on Environmental-Economic Accounting, which should also oversee the development strategy and subsequent work. The development strategy should consider country training needs, including a set of simple standard tables that countries could choose to produce as appropriate to their circumstances.

D. Good practices in official statistics for the assessment of impacts of and vulnerability and adaptation to climate change

43. Measurement of the impact of greenhouse gas emissions on the climate and the direct impact of climate change on the environment will be based in most cases on sources outside the statistical system. They include meteorological and hydrological information, and data from scientific monitoring and research. Although environmental impact analysis itself is usually outside official statistics and belongs

to the field of modelling, official statistics can make a major contribution to this work.

44. The impacts of climate change go beyond the direct environmental impacts, as there are social and economic consequences. Assessments of vulnerability to climate change should also take account of economic and social factors, as well as environmental ones. Official statistics should be an important source of information about these economic and social consequences and factors.

45. In order to support the assessment of these impacts and the capacity to react to them, there may be a need to establish new data collections and databases, depending on the major policy concerns and priorities of the countries. There are examples of ongoing work such as the development of the statistical database on natural disasters in India that is without doubt within the competence of official statistics and national statistical offices.

46. In the analysis of the impacts of and vulnerability to climate change one of the key challenges with regard to statistics is the need to bring together different types of information from very different sources. Linking social, environmental and economic information is essential for these types of analyses and national statistical offices can and should play a role in that. Tools such as spatial analysis, and the use of geo-referenced official statistics is essential for the assessment of the social and environmental impacts, vulnerability and their regional variations. Indicators also play an important role in the assessment of impacts and vulnerability. The System of National Accounts (input-output tables) and the System of Environmental-Economic Accounting, if they are well established, offer the possibility to analyse the linkages between the environment and the economy in a consistent fashion.

47. Adaptation is an area where there is likely to be considerable policy intervention. By design, adaptation policies will be aimed at addressing economic and social impacts of climate change. It is in this area that national statistical offices have much data of interest. Environmental accounts may also be of relevance in linking environmental and economic issues. Exchanges of ideas would assist national statistical offices in deciding what statistics might be relevant in their countries to support adaptation analysis.

48. At the Oslo Conference it was recommended that much more has to be done on the use of geographical information systems and on the development of spatial data infrastructures. Demographic, social, economic, environmental and cartographic information is integrated in Geographical Information Systems (GIS). GIS brings together the different types of information by presenting them as layers on the basis of their geographical attributes. There is a great potential in the use of GIS for spatial analysis of the impacts of and vulnerability to climate change and the analysis of different adaptation strategies. Many of the data sets held by national statistical offices are essential from this perspective. These include, among others, population, agriculture and economic censuses, but the data from these sources will need to be overlaid, using a spatial framework. These frameworks will exist in many countries but in others will require the development of spatial frameworks and the design or the processing of the relevant statistical collections so that they can support these frameworks.

49. The following recommendations are related to recommendations 3-5 and paragraphs 43 and 44 above.

Recommendation 6
Share best practices on the statistical analysis of the impacts of and vulnerability and adaptation to climate change. The analysis of the impacts of and vulnerability to climate change as well as the analysis of the adaptation strategies should be supported by the exchange and discussion of good practices by establishing a knowledge base on new approaches, to gather, compile and share experience. Therefore it is recommended that an electronic platform be set up for the dissemination of good practices and an international forum (regular expert group meetings or workshops) be established for their discussion.

Recommendation 7
Improve and promote the use of Geographic Information Systems and other spatial infrastructure for the climate change-related spatial analysis of statistics. The use of Geographic Information Systems and other spatial data infrastructure for the climate change related spatial analysis of official statistics should be improved and promoted. Workshops on the development of spatial frameworks and the coding systems that need to be established to support these frameworks should be organized, building, for example, on existing Census-based workshops on the utilization of GIS systems to cover their use for analysis of climate change, or developing a module on the use of spatial frameworks and GIS systems for the analysis of climate change in training workshops on environment statistics.

E. Cross-cutting recommendations

50. Following are cross-cutting recommendations.

Recommendation 8
Develop a framework for climate change-related statistics. A framework for identifying and assessing existing statistics and gaps relevant to climate change and for the organization of climate change-related statistics has to be developed, based on the scientific and policy framework established by the Intergovernmental Panel on Climate Change and UNFCCC. This framework should also make it possible for countries to identify a set of data items and statistical tables or indicators for compilation according to their national priorities and circumstances.

Recommendation 9
Promote the use of indicators at the national level and provide statistical expertise for indicator development:

(a) **The development and compilation of a core set of sound indicators related to climate change, focusing on the pressures, impacts, vulnerability and adaptation, and mitigation, is a useful way to convey the main messages to policy- and decision-makers and the general public and is also a good way to start statistical work on national priority areas. Such work has already started in many countries, frequently as part of a larger set of sustainable development indicators. Indicator development has the most added value at the national level;**

(b) **Nevertheless, the international statistical community is expected to provide statistical expertise when selecting climate change-related indicators at the international level.**

Recommendation 10
Advocate the use of official statistics in climate change-related policies. Advocacy also requires basic knowledge and the various policy responses that are being considered. Training material that explains the basics of climate change-related policies with a focus on the use of official statistics should be prepared to support national statistical offices in their advocacy areas.

Recommendation 11
Support the estimation of the macroeconomic impacts of climate change, mitigation and adaptation. Climate change impacts, and mitigation and adaptation policies, will have macroeconomic impacts. While it is not the job of official statistics to estimate these impacts, it is their job to provide the data to support the models that are used for these estimates. This may require the collection of additional data. This is the expertise of national statistical offices, although it is recognized that additional funding may be required.

F. Official statistics and the Intergovernmental Panel on Climate Change assessment reports

51. As outlined above, the main driving forces behind the pressures that affect our climate are the growth of the population and the economies, and the related production and consumption activities. Statistics on these activities are essential for climate change scenario development and modelling. These statistics are traditionally part of national and international official statistics. Increasingly, statistics on energy use by type of energy are also becoming available that enable estimates of energy intensity, energy efficiency and carbon intensity, which are also essential inputs into scenario modelling, as part of official statistics. There should be a dialogue and collaboration between the Intergovernmental Panel on Climate Change and official statisticians to ensure that official statistical work is used to its best effect. Also, the closer involvement of official statistics in the work of the Panel should contribute to the improvement of the statistics that are needed for scenario development and modelling.

Recommendation 12
Initiate a dialogue with the Intergovernmental Panel on Climate Change on the use of official statistics for scenario development and modelling in future assessments of climate change.

VI. Coordination and governance

52. The execution and implementation of all these tasks described in section V above, including engaging with the Intergovernmental Panel on Climate Change and UNFCCC on a more formal basis and the transfer of knowledge to countries, will require proper governance. The process needs global leadership at the level of the

United Nations Statistical Commission and should be governed by a body of senior statisticians from the countries. The Committee of Experts on Environmental-Economic Accounting offered a structure for governing the work on the development of climate change-related official statistics. Comprising senior level experts in environment statistics and accounting, this body was created by the United Nations Statistical Commission for developing SEEA as an international standard. It makes sense to extend the mandate of this Committee to cover environment statistics (including climate change-related statistics), rather than setting up a new Committee where there would be considerable overlap. In doing this, is it is recognized that the work of the Committee would be broadened beyond the development and implementation of SEEA as an international standard, although, given the role that SEEA can play in climate change analysis, this work would continue to have a priority along with other work associated with official statistics and climate change.

Recommendation 13

Expand the mandate and membership of the Committee of Experts on Environmental-Economic Accounting to provide oversight of international statistical activities related to climate change. It is recommended that the name, mandate, terms of reference and membership of the Committee of Experts on Environmental Economic Accounting and its Bureau be amended and extended and that the Committee be trusted with the governance of the statistical tasks related to climate change, including engagement with UNFCC, the Intergovernmental Panel on Climate Change and other stakeholders. One of the earliest tasks of the Committee should be to develop, in consultation with the United Nations Statistics Division, an implementation strategy, with agreed outputs, timelines and assigned responsibilities, for the agreed recommendations.

VII. Summary of recommendations

53. The recommendations in sections V and VI are summarized as follows:

(a) Ensure that relevant international statistical standards and classifications give proper attention to climate change issues, with a particular focus on land use classifications and energy and energy use statistics (recommendation 1);

(b) Strengthen the role of national statistical offices in the compilation of greenhouse gas inventories and improve the quality of greenhouse gas emission statistics as part of official statistics. Set up a working group with UNFCC to look into emission statistics and related classifications (recommendation 2);

(c) Develop new statistics and share best practices on advanced analysis of existing statistics to support mitigation mechanisms and measures (recommendation 3);

(d) Ensure that key macroeconomic statistics take into account the implications of emission trading schemes and other mitigation mechanisms (recommendation 4);

(e) Develop further and implement the System of Environmental-Economic Accounting with a focus on its applications to support climate change-related analysis (recommendation 5);

(f) Share best practices on the statistical analysis of the impacts of, and vulnerability and adaptation to, climate change (recommendation 6);

(g) Improve and promote the use of Geographic Information Systems and other spatial infrastructure for the climate change-related spatial analysis of statistics (recommendation 7);

(h) Develop a framework for climate change-related statistics (recommendation 8);

(i) Promote the use of indicators at the national level and provide statistical expertise for indicator development (recommendation 9);

(j) Advocate the use of official statistics in climate change-related policies (recommendation 10);

(k) Support the estimation of the macroeconomic impacts of climate change, mitigation and adaptation (recommendation 11);

(l) Initiate a dialogue with the Intergovernmental Panel on Climate Change on the use of official statistics for scenario development and modelling in future assessments of climate change (recommendation 12);

(m) Expand the mandate and membership of the United Nations Committee of Experts on Environmental-Economic Accounting to provide oversight of international statistical activities related to climate change (recommendation 13).

54. To undertake the full range of work proposed would require a significant effort, both nationally and internationally, although it should be recognized that work on some of the proposed actions has already commenced. There is a need to prioritize the work. The review provides a suggested prioritization for consideration by the United Nations Statistical Commission.

VIII. Timing and priorities

55. The above list of recommendations and actions is quite extensive. Not everything that is suggested is achievable in the short term. There is a need to prioritize and focus on the most important issues. We suggest the following priorities as a starting point for discussion, recognizing that, in order to undertake all of the suggested work, a significant effort would be required, both nationally and internationally, particularly by the United Nations Statistics Division and United Nations Committee of Experts on Environmental-Economic Accounting. Countries would need to be prepared to contribute to this work. Following the Statistical Commission discussion of timing and priorities, an implementation strategy needs to be developed, as mentioned in recommendation 13.

56. As a starting point, the following categorization of work is suggested. There is no implied order within each group. Short-term actions include a mixture of the most important actions to work on and those where results can be achieved reasonably easily. There is a focus on greenhouse gas emission inventories, where it is considered that official statistics can add significant value. Also of importance is the need to improve the use of official statistics to support analysis of climate change impacts.

(a) Short-term (immediate action):

(i) Strengthen the role of national statistical offices in the compilation of greenhouse gas inventories and improve the quality of greenhouse gas emission statistics as part of official statistics; set up a working group with UNFCC to look into emission statistics and related classifications (see recommendation 2);

(ii) Devise a strategy for land use/land cover statistics (see recommendations 1, 2 and 7);

(iii) Initiate a dialogue with the Intergovernmental Panel on Climate Change in order to improve the use of official statistics for scenario development and modelling (see recommendation 12);

(iv) Support the analysis of climate change impact, vulnerability and adaptation by the exchange and discussion of good practices (see recommendation 6);

(v) Review the implications for the national accounts for emission trading schemes (recommendations 1 and 4);

(vi) Continue to further develop and implement the System of Integrated Environmental-Economic Accounting as an international standard (see recommendation 5);

(vii) Develop a framework for the organization of climate change-related statistics (see recommendation 8);

(b) Medium-term (start as soon as possible):

(i) Review sectoral statistics to assess whether our statistical standards require updating to reflect the importance of environment and climate change analysis (see recommendation 1);

(ii) Produce relevant statistics for the use of the Intergovernmental Panel on Climate Change for its scenario development work in its fifth assessment round (see recommendation 12);

(iii) Review Government Finance Statistics classifications to ensure that they support climate change analysis (see recommendations 1 and 4);

(iv) Support the monitoring of emission trading schemes and other mitigation measures by the advanced analysis of existing tools and by developing new statistics (see recommendation 3);

(v) Develop a set of data items and tables (see recommendations 5 and 8);

(vi) Improve indicators at the national level to convey messages (see recommendation 9);

(vii) Improve and promote the use of Geographic Information Systems and spatial data infrastructure for spatial analysis (see recommendation 7);

(viii) Identify data to best support climate change modelling (see recommendations 11 and 12);

(c) Long-term: implementation strategy for introducing revised standards (see recommendations 1 and 4).

57. This work will be of limited use unless there is real engagement with users of climate change statistics. There are both international and national users. The United Nations Statistics Division needs to take the lead on engagement with international and regional agencies. It may be useful to set up a consultative committee for these purposes. At the national level, national statistical offices have the lead responsibility.

58. Also, in many countries, there is a need for training and capacity-building: without that nothing much will happen. A short-term priority should be to identify training needs and an implementation strategy. The actual delivery of training and capacity-building should be regarded as a medium-term strategy.

IX. Points for discussion

59. **The Commission may wish to express its views on the:**

(a) **Objectives of future work on climate change statistics outlined in section II;**

(b) **Recommendations and actions proposed in section V;**

(c) **Proposed governance arrangements proposed in section VI;**

(d) **Timing and priorities suggested in section VIII.**