Economic and Social Council

Economic Commission for Europe

Conference of European Statisticians

Sixty-first plenary session
Geneva, 10-12 June 2013
Item 8 (a) of the provisional agenda
Reports of the Conference of European Statisticians Bureau and Teams of Specialists, and approval of the United Nations Economic Commission for Europe Statistical Programme 2013

Interim recommendations on the key directions for future in climate change related statistics

Note by the Task Force on Climate Change Related Statistics

Summary

The note provides interim recommendations developed by a Task Force working under the Conference of European Statisticians. The purpose is to assist national statistical offices in better meeting data requirements related to climate change and to communicate key policy messages on the role of official statistics in measuring climate change related phenomena. The Task Force has provided a progress report as document number ECE/CES/2013/11.

This note has been drafted at the request of the Bureau of the Conference of European Statisticians at its meeting in February 2013. The Bureau expressed strong support for the initial recommendations developed by the Task Force and stressed the need for urgent action by statistical offices in climate change related statistics.

The Conference of European Statisticians is invited to comment on these interim recommendations by sending their feedback to Anu Peltola of the United Nations Economic Commission for Europe secretariat (anu.peltola@unece.org) by 30 June 2013. These recommendations will form the basis of the final report, planned to be submitted to the Conference in April 2014.

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I. Introduction

1.   This paper responds to a request made by the Bureau of the Conference of European Statisticians (CES) during its February 2013 meeting. At that meeting, the Task Force on Climate Change Related Statistics[1] presented an interim set of recommendations based on a November 2012 expert meeting. The CES Bureau expressed strong support for the interim recommendations and stressed the need for urgent action by statistical offices to improve climate change related statistics. This paper summarizes the interim recommendations and suggests key directions for future that national statistical offices (NSOs) can take action on immediately. A final report with the recommendations and more detailed consideration of the issues will be submitted to the Conference in April 2014.

2.   The interim recommendations presented here primarily address data that are already collected by NSOs and that can support analysis or research related to climate change. Scientific data (e.g. meteorological data) that are used to measure changes in weather and climate were not a focus of the Task Force and are only touched on briefly in this note.

II. Competencies of national statistical offices in climate change related statistics

3.   The adherence of NSOs to the international principles of official statistics[2] means that NSOs bring a number of important attributes to the discourse on climate change. Given the sometimes controversial nature of this discourse, professional independence is one such attribute. Other attributes include a commitment to well-defined quality standards, the use of sound and transparent methodologies, a focus on publishing data in long and consistent time series and a commitment to data accessibility.

4.   The main focus of national statistical systems is on human systems and on how they interact with natural systems. NSOs measure the activities of enterprises, individuals, households, institutional and government sectors and regions. Therefore, environmental data that are related to industries and households i.e. human systems – including climate change – can be covered by NSOs.

5.   Research studies and reports often provide a picture of an issue at a point in time. In contrast, statistics are designed expressly for evaluating change over time. Climate change is an issue that demands evaluation over time and is, therefore, a topic that will benefit from using the long time-series available in the statistical system. Furthermore, NSOs have developed methods for improving timeliness of statistics, so they can help in responding to the demand for timelier climate change information.

6.   In spite of the many competencies NSOs offer for the measurement of climate change, it remains a challenge to determine how existing statistics can be made most useful for climate change analysis. The existing statistics lack a specific focus on climate change

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[1] The Task Force was established by the CES in November 2011 to identify practical steps to support future development of climate change related statistics in NSOs in order to meet user needs and to enhance the role of official statistics in greenhouse gas emission inventories. The Task Force consists of representatives of the statistical offices of Canada (Chair), Italy, Finland, Norway, United Kingdom and Mexico as well as the European Environment Agency, Eurostat and the Directorate-General on Climate Action of the European Commission.

[2] The Fundamental Principles of Official Statistics and the European Statistics Code of Practice.

and vary a great deal across countries. Thus, the statistical system needs to focus its efforts on how to better respond to climate change.

7.   In many countries, NSOs are not responsible for environmental statistics that have no relation to human systems. For example, state of the environment reports and measures of biodiversity are typically the responsibilities of environment ministries or specialised agencies. One of the challenges of developing climate change related statistics is, therefore, the varying division of work between various national bodies.

8.   Likewise, identifying new statistics and elements that must be incorporated into statistical systems to support climate change analysis, such as monitoring the move towards greener consumption and production patterns, is a challenge.

III.   Scope of climate change related statistics

9.   To identify how NSOs could better respond to the need for climate change related statistics, it is first necessary to define the scope of such statistics. The Task Force has devoted considerable discussion to this issue[3]; in particular, through examination of different frameworks and approaches used in the compilation of environmental statistics[4] and through evaluation of user needs. The conclusion of these discussions is that as climate change impacts the environment and society through complex interactions and cause-effect relations, the conceptually based definition of climate change related statistics would necessarily be wide and exhaustive. However, that would not be very helpful for focusing the NSOs' work. A practical approach has, thus, been taken by the Task Force.

10.   Climate change touches upon a broad range of human activities – from energy use, to transportation, waste generation, agriculture, land use, forestry and manufacturing. Indeed, few human activities are not related somehow to climate change, either as a contributing factor or via an impact. Similarly, climate change influences a wide range of natural phenomena: rainfall, temperatures, ocean and air currents and ecosystems that have an impact on human activities.

11.   In this very broad sense, climate change related statistics include:

> *environmental, social and economic data that measure the human causes of climate change, the impacts of climate change on human and natural systems, the efforts of humans to avoid its consequences as well as their efforts to adapt to those consequences that are unavoidable.*

12.   Such a broad definition is not very helpful to NSOs wishing to focus on improving climate change related statistics. Therefore, a pragmatic approach is needed to narrow the scope to those areas where NSO involvement is most important. Based on the above discussion of NSO competencies, this would include those areas where the interface between human and natural systems is most important in terms of understanding climate change – both from the point of view of its causes and its consequences.

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[3] *Scope of Climate Change Related Statistics,* note prepared by the Task Force, coordinating author Julie L. Hass, Statistics Norway.
www.unece.org/fileadmin/DAM/stats/documents/ece/ces.ge.33/2012/mtg3/Scope_of_Climate_Change_Related_Statistics.pdf

[4] The frameworks and approaches studied included: (DPSIR) Driving forces-Pressure-State-Impact-Response; UN (FDES) Framework for the Development of Environmental Statistics; Natural capital; Adaptation-mitigation.

13.   Statistics about the human activities that lead to the build-up of greenhouse gases in the atmosphere are, thus, among the most important topics of focus for NSOs. This includes statistics on energy use, specific industrial processes, agriculture, waste generation, land use, forestry and use of specific products (e.g. solvents).

14.   Key statistics concerning energy[5] include energy balances along with more detailed sectoral statistics related to energy use, for example breakdowns of energy use in transport.

15.   Furthermore, key statistics on industrial production include cement production, chemical production, metal production and halocarbon production and use. Statistics on other economic activities including agriculture, forestry and waste management are also relevant.

16.   These statistics provide the foundation for compiling greenhouse gas emission inventories. All Annex I countries to the United Nations Framework Convention on Climate Change (UNFCCC) are required to compile such an inventory and submit it to the UNFCCC annually.[6] While NSOs are usually not directly responsible for these inventories, the statistics mentioned above are key inputs into their construction. Thus, NSOs have a crucial role to play in ensuring the quality of national greenhouse gas emission inventories and the statistics used to build these inventories should be considered part of the core of NSOs' work on climate change related statistics.

17.   In addition to the statistics needed for the greenhouse gas emission inventories, climate change related statistics include the data required for monitoring the consequences of climate change for human and natural systems. Again, it is the consequences that manifest themselves at the interface of these two systems that are the appropriate focus for NSOs. It is not, however, the task of statistical systems to analyse to what extent a specific phenomenon has been caused by climate change. But the task of official statistics is to provide the data that are necessary for such analysis.

18.   Statistics under the general heading of consequences include those on the impacts of climate change, on the efforts to mitigate these impacts, on the efforts to adapt to them and on vulnerabilities to them, for example:

    (a)   Statistics of relevance to impacts of climate change include *inter alia* food production, water availability and use, timber production and disease incidence;

    (b)   Statistics of relevance to mitigation include, for example, expenditures on energy efficiency improvements, renewable energy and other technologies to reduce greenhouse gas emissions;

    (c)   Statistics of relevance to adaptation can include, for example, expenditures on infrastructure improvements (breakwaters, hurricane-resistant housing) and structural changes (shifts in employee and output);

    (d)   Finally, statistics of relevance to vulnerability include *inter alia* population and infrastructure at risk from extreme weather events, employment and output in climate-

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[5]   CO2 emissions from energy use (combustion of fossil fuels) amount to 70-90% of total anthropogenic CO2 emissions. Revised 1996 IPCC Guidelines for National Greenhouse Gas inventories: Reference Manual, p. 1.8.

[6]   Annex I countries include the industrialised countries that are members of OECD and countries with economies in transition, such as the Baltic States, and several Central and Eastern European States. For example, most European countries, Australia, Canada, Japan, Russian Federation, New Zealand and United States are part of Annex I countries. In addition to Annex I countries, other countries compile greenhouse gas inventories for their own purposes.

dependent industries and health status of key populations (youth, the elderly and the infirm).

19.   The above listing of statistics is not comprehensive, but begins to provide a sense of what a core set of climate change related statistics might look like. The final report of the Task Force will elaborate on this in more detail.

IV.   Interim recommendations

20.   This section introduces the Task Force's interim recommendations concerning the role of NSOs in the provision of climate change related statistics. The recommendations are grouped into four categories: recommendations of a general nature; recommendations related to the statistics needed to compile greenhouse gas emission inventories; recommendations related to other climate change related statistics and recommendations related to statistical infrastructure required for this work.

A.   General recommendations

21.   **The improvement of climate change related statistics should be implemented in steps**: first by better organising existing statistics, second by improving the quality of existing statistics and only third through the production of completely new statistics. When considering the production of new statistics, it is important to recall the key competencies of NSOs and take into consideration their traditional boundaries. For instance, NSOs do not usually compile forecasts or make judgements about cause-effect relationships.

22.   **NSOs should consider the need to inform climate change analysis when reviewing their statistical programs and data collections.** For instance, improvements to data related to food production and water use, health and disease monitoring, population and population growth will benefit climate change analysis. Consideration should be given whenever possible to geo-referencing this information.

23.   Communicating statistics is a core business of statistical offices. For the moment, the information needed for understanding the causes and consequences of climate change is scattered across a wide variety of national and international organisations. **NSO communication channels would provide an efficient means of disseminating climate change related statistics.** To this end, a structure or a framework should be developed for organizing the different categories of climate change statistics and their metadata. Creating portals for climate change related data would make them more accessible and easier to use, even when the information is not produced by the NSO. Although NSOs do not produce most of the scientific data related to climate change, the possibility of cooperation with scientific organizations (e.g. meteorological services) in the dissemination of their data (e.g. temperature, extreme weather events) should be considered.

24.   The longer term goal should be to define **a set of regularly produced statistics on climate change that could be developed as part of official statistics.** Countries are currently developing climate change indicator sets for policy purposes. This work should be internationally coordinated to enable availability of comparable statistics across countries.

25.   In the longer run, **organizational changes may be needed in NSOs** to support the production of climate change related statistics that cut across the statistical system. According to the vision of the High-level Group for the modernization of statistical processes and services (HLG), "the challenge for statistical organizations is to be sufficiently flexible and agile to provide statistics according to user needs, at an acceptable cost." They state that "in some specific statistical domains, only cross border data make

sense, for example globalisation, enterprise groups and climate change", but these statistics may pose challenges to the structure and functioning of statistical organizations. Similarly, statisticians will require new kinds of expertise, meaning that **NSOs will be required to look beyond traditional disciplines when recruiting staff.**

B. Recommendations related to greenhouse gas emission inventories

26. **NSOs must continue to improve statistics required for greenhouse gas emission inventories; including, energy, industry, transport, agriculture, waste, forestry and land-use statistics.** In particular, emphasis should be put on improving the quality of energy statistics. Improved data are needed on the production of heat and electricity for own use by households and enterprises and on renewable energy sources (e.g., solar energy, fuelwood, biogas, animal dung, wind, heat pumps/geothermal sources).

27. **NSOs** should **be proactive in reaching out to national** greenhouse gas **emission inventory compilers and other producers of climate change related statistics outside the official statistics system**. They should work with those agencies to identify and evaluate NSO statistics needed for emission inventories to see if they are fit-for-purpose. Annual greenhouse gas emission inventory review reports would be an important source of information for NSOs to identify national data improvement needs. Improvements to NSO data reporting systems should be considered.

28. Considering that NSOs provide a considerable portion of the statistics required for greenhouse gas emission inventories, **NSOs should be considered as official institutions in the national** greenhouse gas **emission inventory systems in all countries**. NSOs should be given a clear role in providing statistics, assisting in calculations as needed and assisting with quality assurance. National legislation should facilitate effective cooperation between agencies belonging to the national emission inventory system and provide a legal basis for exchange of data as required for the inventories. In this context, it is worth noting that all countries that are party to the next international climate convention will need to have approved national inventories of good quality that are suitable for monitoring developments in emissions. The 17th UNFCCC Conference of the Parties in Durban agreed to put in place by 2015 a global "protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties" to be implemented from 2020, essentially moving away from[7] the current divide between industrialised and developing countries in future accords. This will bring about a major change from the current situation in which only Annex I countries are required to submit annual inventories. There is, therefore, an important opportunity in the next few years to involve NSOs to provide a solid foundation for emission inventories in countries that will be obliged to compile them.

29. Further to this, closer involvement of the statistical community in the processes linked to international climate accords would help countries fulfil the related data requirements. **NSOs should, therefore, actively follow up on the outcomes of the UNFCCC conferences of the parties** to better understand and prepare for the associated data requirements.

30. Moreover, existing NSO statistics might be made more useful for emission inventories if the statistical community were consulted by the UNFCCC when it is drafting data requirements. **NSOs should, therefore be included in, or at least consulted on, emission inventory methodology development.**

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[7] Decision 1/CP.17.

31.   **The international statistical community and many NSOs (especially in Annex I countries) can be important partners in building capacity and knowledge** required for greenhouse gas emission inventories, quality assurance and sound statistical methodology. Many NSOs have extensive experience in statistical capacity building and improving availability of evidence based information for monitoring development towards international development goals.

32.   Currently, existing NSO statistics are not used to their full potential for emission inventories and some duplication of data collection exists. To this end, **NSOs and inventory compilers should review existing reporting systems for emission inventories to identify areas for synergies**. The aim would be to improve coherence of data, reduce costs, avoid the establishment of duplicate data reporting and move towards multipurpose data systems serving various user needs.

33.   **The experience of the statistical community in quality assurance would be useful in supporting the efforts at strengthening the quality of emission inventory data as well as other climate change related statistics.** In particular, NSOs could be more involved in the discussions concerning the "measureable, reportable and verifiable" approach during UNFCCC COP negotiations.

C.   Recommendations related to other climate change related statistics

34.   As **new** economic instruments are developed to deal with climate change (e.g. carbon taxes, tradable emissions permits, subsidies) **reliable data on the use of economic instruments will be needed as part of government finance statistics and national accounts.** The measurement of the financial flows associated with the use of these instruments and the inclusion of these flows in a clear, consistent and observable fashion in government finance statistics and national accounts needs to be addressed.

35.   There is a data gap regarding reliable and regular statistics on resilience, risks and vulnerabilities to climate change. Official statistics are often used for describing vulnerabilities. **NSOs should consider developing vulnerability-relevant indicators, such as populations at the risk of natural disasters or poverty due to changing climate (increased heat/cold, desertification, etc.).**

36.   The statistical system has traditionally focused on administrative regions in the dissemination of statistics. To address climate change, **statistics are required according to new geographical areas– such as coastal areas or areas prone to flooding or drought**. Providing more information related to urban areas will become more important, especially in developing countries.

37.   **NSOs should consider how to contribute to the on-going efforts to monitor biodiversity and ecosystems.** Climate change will have significant and long-term impacts on ecosystems and the related goods and services arising from ecosystems. Establishing baseline estimates of ecosystems today will make the assessment of the impacts of climate change more robust.

D.   Recommendations related to statistical infrastructure

38.   NSOs should review **classification systems, registers, definitions and other infrastructure elements they use** to see that the needs related to climate change analysis are appropriately addressed.

39.   **Consideration should be given to the needs of climate change analysis in future revisions of standard frameworks used in official statistics.** For instance, changes in the

System of National Accounts might improve the availability of statistics to understand emission trading systems. The obstacles to the linkage of environmental and energy statistics, both with each other and with the national accounts, should be identified and addressed. Examples include reviewing differences in the concept of 'energy' across statistics, ensuring data consistency across organizational borders and testing the use of supply-use and input-output data for linking industrial production to energy use and air emissions. These actions could help increase the coherence of statistical data related to climate change and lead to improved energy statistics.

40.   Access to micro-data is important for policy makers and scientists working on climate change. To this end, **new approaches should be considered by NSOs for dealing with confidentiality issues within the scope of their legal mandates** to ensure a better response to climate data needs.

41.   Climate change analysis benefits from detailed, geo-referenced data and the combination of data across statistical domains. **The statistical system needs to develop methodologies and tools for producing and using geo-referenced data.**

V.   Conclusion

42.   The Conference is invited to comment on these interim recommendations since they will form the basis for the final report of the Task Force. Countries and organisations are welcome to send their feedback to Anu Peltola of the UNECE secretariat (anu.peltola@unece.org) by 30 June 2013.

43.   The Task Force plans to finalise the full report by the end of 2013 in order to submit it for wide consultation with all CES member countries and organizations in early 2014. Subject to the outcome of the consultation, the report will be submitted to the CES plenary session for endorsement in April 2014.