Part II: Questionnaire for Representatives of International Organizations

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1. Please describe current activities of your organization in the area of environmental and economic accounts.

Since many years, and at least the creation of the environment statistics division (1986) and the involvement of the national accountants in the process with the London Group (1994), Eurostat has steered the development of economic and environmental accounts in Europe – and played a major role on the international scene. The EEA, which started its activities in 1994, rapidly expressed its interest for environmental accounting as a source of consistent information for carrying its own assessments. Therefore, the EEA was progressively involved in the process and became a member of the task force that drafted the 'European Strategy for Environmental Accounting' approved by the Statistical Programme Committee in 2003. Particular interest of the EEA at this stage was for the consolidation of the production of environmental protection expenditure accounts (the SERIEE methodology), Material Flows Accounts, sector accounts of NAMEA type, Water Accounts and Land Accounts. In this context, the EEA started its own activities, with present results in two domains.

- **Material Flows Accounts:** In the European Union, the issue of resource use is increasingly reflected in the policy agenda. The 6th Environment Action Programme of the European Union identified Sustainable Use and Management of Natural Resources and Wastes as one of its priority areas (Articles 2 and 8). With respect to material and resource flows, the programme aims at "better resource efficiency and resource and waste management to bring about more sustainable production and consumption patterns, thereby decoupling the use of resources and the generation of waste from the rate of economic growth and aiming to ensure that the consumption of renewable and non-renewable resources does not exceed the carrying capacity of the environment" (Article 2.2). In order to pursue these general objectives, the European Commission is developing a Thematic Strategy on the Sustainable Use of Natural Resources (Article 8.2 (i)).

  As a consequence of the policy requirements, the EEA has started working on MFA's since the end of the 1990's. This activity has benefited from previous Eurostat's work on MFA's, as well as from the expertise of EEA's network. In 2001, the EEA decided to expand the scope of work of its former European Topic Centre on Waste to include material flow analysis. Concerning material flow analysis, the key work objectives of the ETC/WMF include:
  - provision of reliable and comparable data and information on material flows in Europe;
  - reporting and publication of findings in reports produced by the EEA;
  - further harmonisation of methodologies in the area of material flow accounting and indicators;

- support to policy makers in developing policy strategies and measures in the new policy field of sustainable use of natural resources.

Indicators from MFA, such as the Total Material Requirement, have been widely used by the EEA, e.g. in the indicators based report so-called "Environmental signals", with a special chapter in 2002.

- **Land and ecosystem accounts**: The European territory is at the same time rich in high value ecosystems and landscapes, densely populated and rapidly changing. Key policies of the European Union have important impacts on the territory: the Common Agriculture and Rural Development Policies, the Regional Policy, which objective is to guarantee the cohesion of Europe, the Transport policy and the planned Trans-European Networks and, last but not least, the Environment policy, in particular related to Nature Conservation (Natura 2000) and the objective of halting losses of Biodiversity by 2010, river basins management (Water Framework Directive), Urban strategy under preparation or the Integrated coastal zones management strategy. This non-exhaustive list shows the necessity for Europe to have a common reference for describing its territory, from the point of view of the uses of land and their impacts on ecosystems and landscapes. This requirement is the origin of the so-called Corine Land Cover (CLC) map, which supplies an image of cities, agriculture, forests, wetlands and other natural areas. This image is based on a common methodology, implemented now in circa 30 countries. CLC is widely used and the 1990 image is being currently updated for the year 2000, as a joint programme of the European Union (involving the Commission directorates of Environment, Agriculture, Regional Policy and the Joint Research Centre) and the Member States (as well as candidate countries).

  From the Corine database, the EEA has decided to implement European-wide Land and Ecosystem Accounts (LEAC). These accounts comply with the methodology of the SEEA for land and ecosystem accounts and have been tested in a joint research by the EEA (with the participation of its Topic Centre on Terrestrial Environment) and Eurostat. Core accounts of land cover have been produced for several countries, most of Europe being expected to be covered by the end of 2004. Operational indicators have started to be derived from LEAC for Urban Sprawl, Agriculture land uptake by urban and infrastructures development, Conversion from pasture to arable land and permanent crops, Conversion of forests and semi-natural and natural areas to agriculture. As well, LEAC are used as a common reference for the ongoing assessment of the integrated coastal zones management policy of the EU.

  Based on a geographical image, LEAC can be produced at various scales and fit the needs of the many users from the European to the local levels of policy making as well as for the citizens. Therefore, the decision has been taken to give a full access to LEAC on the EEA website, for complete downloads as well as for on-line and customized extraction by users of accounts, indicators, graphs and maps.

  One important property of LEAC is the interconnection between land use and ecosystems.

  As for land use, linkages between LEAC zonings and conventional statistics have been recently examined (e.g. for agriculture, forest or tourism). With the main exception of population statistics that are available at the municipal level, statistics are not currently centralised at the European level with an optimal level of geographical disaggregation

for being integrated fully in LEAC. Work is continuing on this subject to identify appropriate levels of aggregation for reporting as well as alternate data sources and possibilities of modelling spatial distributions.
Ecosystem accounts are presently tested for wetlands. The challenge is to bridge land cover accounts and the various databases on fauna and flora for identifying possible problems of health (ecosystem distress).
The first results of land and ecosystem accounts have been presented as an EEA contribution last June in a workshop on Global Change and the Future of Ecosystems in Europe organised with the Millennium Ecosystem Assessment programme.

2. Please, describe future activities in the area of environmental and economic accounts.

- **MFA's**: Continuation
- **LEAC**:
  - Land cover accounts: full implementation and improvement of the system; feasibility study of possibilities of updating LEAC every 2 to 5 years, in-between 2 Corine land cover inventories (every 10 years by now), using medium resolution imaging instrument such as ENVISAT-MERIS
  - Land use accounts: integration of statistics (demographic, social and economic) in the LEAC framework, with priority to land use functions such as housing, transport, agriculture and tourism.
  - Ecosystem accounts: continuation of the pilot work on wetlands, integration with water accounts (see below), exploration of ecological corridors and dry grassland issues.
  - Use of LEAC for modeling and scenarios building, in particular in relation to sector policies and the impacts of climate change.
  - Use of LEAC for framing the assessment of the natural capital value of ecosystems (asset values, ecosystem services…) at the EU level and considering EU responsibility in a global perspective.
- **Water accounts**: development of water accounts in a river basin perspective, as a component of spatial analysis. Priority will be given to accounts of the quality of rivers, the polluting emissions to rivers and groundwater, the availability of water resource for human use and ecosystems (assets, supply and use), ecosystem accounts (rivers and lakes, ecological corridors, water and wetlands, river basins and coastal water…).

3. In your opinion, what should be the role of the Task Force on environmental-economic accounting?
(Our answer cover questions 3 as well as 4 and 5)

The role of an international Task Force on environmental-economic accounting can be described around 3 bullet-points:

- Promote international assessments at the relevant geographical scales (Globe, Regions, International river basins, International ecological corridors, Seas…) in support to the implementation of the International Conventions and action programmes related to environment and sustainable development.

Non-exhaustive list of International Conventions and action programmes

- sustainable development (The Rio Declaration on Environment and Development http://www.unep.org/documents/default.asp?documentid=78),
- biodiversity (Convention on Biological Diversity http://www.biodiv.org/convention/articles.asp,
- transfrontier pollution (Convention on Long-Range Transboundary Pollution http://www.unece.org/env/lrtap/,
- marine pollution (Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter http://www.londonconvention.org/main.htm,
- endangered species (Convention on International Trade in Endangered Species(CITES) http://www.cites.org/eng/disc/text.shtml
- hazardous materials and activities (Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal http://www.basel.int/text/text.html
- cultural preservation (Convention Concerning the Protection of the World Cultural & Natural Heritage, http://whc.unesco.org/world_he.htm),
- desertification (United Nations Convention to Combat Desertification, http://www.unccd.int/),
- uses of the seas (United Nations Convention on Law of the Sea (UNCLOS) linked from http://www.unclos.com/),
- climate change (United Nations Framework Convention on Climate Change and the Kyoto Protocol on Global Warming (http://www.unfccc.de/resource/convkp.html).
- protection of the ozone layer Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol (http://www.unep.org/ozone/index.asp)
- access to information, public participation in decision-making and access to justice in environmental matters (Aarhus convention, http://www.unece.org/env/pp/)
- access to clean water (Johannesburg Summit 2002, http://www.johannesburgsummit.org/html/documents/summit_docs/1009wssd_pol_declaration.htm)

…

These international agreements require an assessment not only of their effectiveness but also of the economic and social benefits as well as costs. Debates are hot when considering costs of Kyoto's Protocol implementation vs. impacts of climate change, consequences of deforestation or health issues linked to water. Such assessments of the effects of conventions have started at the World level in programmes such as the so-called Millennium Ecosystem Assessment (http://www.millenniumassessment.org/en/index.aspx), which goal *is "to establish the scientific basis for actions needed to enhance the contribution of ecosystems to human well-being without undermining their long-term productivity"*.

These conventions and action programmes are therefore the policy basis for the development of environmental and economic accounting, a starting point. They influence economic development strategies. Their transposition and implementation into regional as well as national policies request comparable information.

Priority areas for developing accounts could be:

- impacts of climate change,
- river basins and access to clean water

  - ecosystems and ecosystem services (possibly in relation to the Millennium Assessment programme)

- Organise the cooperation between socio-economic statistics, environmental agencies and Earth science communities.

The question of the data is often mentioned as a difficulty in implementing environment-economy accounts. Obviously, serious data gaps exist, in particular when considering the comparability issue. The statisticians who are often in charge of integrating environment-economic accounts don't access always the appropriate data and are, for this reason, sometimes reluctant at assessing vital elements, e.g. circulating or living natural assets. At the same time, the lack of data in some domains should not hide the fact that data holders are many, databases developing fast, information technology for processing data more efficient than ever. International research programmes are at work and collect quantities of data on atmosphere, sea, land; new programmes such as GEO/GEOSS and GMES/Europe foster combined space & in situ monitoring of Earth. Therefore, the data question turns to be, to a large extent a question of data exchange and data assimilation. Statistical offices, which collect the economic and social data, have the expertise in national accounting. They collect as well environmental data, but from second hand, generally with little access to the databases held by environment agencies and research programme. These databases contain the detailed information (from monitoring) necessary for producing parts of the physical accounts, in particular of natural assets.

The channels for data exchange, involving government agencies and international institutions as well as research programmes need to be mobilized further. In particular, the potentials of space technology are very important, in terms of Earth observation by satellite as well as by connecting in situ wireless low-cost sensors to databases. On-going improvement of statistics, better and broader use of sampling, processing of new data (e.g. the phonebooks), geo-referencing of observations, development of local statistics databases are also taking place.

Weak points now are, in our particular domain, with assimilation and modelling capacities. Economic & environmental accounting frameworks can help to a large extent connecting Earth observation to the socio-economic reality as well as socio-economic statistics to the ecological reality.

For Earth science data, the Task force should take into account, in defining its priorities, the present and near future possibilities of progressing by combining the broad picture of international programmes and more detailed information, specific to country needs but still comparable from country to country.

For statistical programmes, the Task force should recommend making the best use of established capacities of expanding the national accounts: environmental protection and natural resource management expenditures, IOT based assessments of resource use and emissions, non-renewable resources assets and depletion. As well, progress on the social dimension of environment and sustainable development should be given a high priority; one way of obtaining results in a short/medium term would be to expand experiences of integrating environmental sheets in the house budget surveys. The information collected in this way at a marginal cost could inform, for social groups on key issues such as the access to clean water and sanitation services or the disposal of waste.

- Support to national initiatives

At the end of the day, national statisticians and experts of national environmental agencies will be the main producers of environmental-economic accounts. Task force should support them as requested, in particular by

- organizing the drafting of operational guidelines: clear, simple and based on the best monitoring data (as opposed to the results of complex modeling) and statistics (from regular surveys, incl. samplings)
- facilitating the funding of case studies and implementation programmes: as long as the policy perspective and priorities are clear
- facilitating technical assistance when requested by a country
- facilitating cooperation between statistical offices, environmental agencies and research programmes, in particular when international programmes can deliver basic information.

London Group

Considering the 3 points above mentioned, the London Group should be used by the Task Force as a forum and an advisory group for specific methodological issues raised during the implementation of the SEEA. Possible outcomes are handbooks for specific issues and peer reviews of national applications.

As well, the London Group should explore further theoretical issues related to the integration between economic and environment in monetary and physical terms, in particular at the meso and macro scales. Monetary valuations, synthetic indicators of resource and potentials, sustainable development threshold values, integration of the spatial and long term dimensions in macro-economic modeling are key challenges and the progress achieved with the SEEA 2003 make it possible to progress. Consolidation of what has been done so far on non-renewable resource as well as the valuation of the part of the natural capital made of cycling systems and ecosystems have to be covered. This action has to be implemented in close cooperation with existing international research and assessments such as the Millennium Ecosystem Assessment, the activities of the International Society for Ecological Economics and other relevant programmes.

4. In your opinion, which activities of the Task Force would best facilitate the implementation of environmental-economic accounting in the countries? See before

5. In your opinion, which activities of the Task Force would best facilitate the promotion of the uses of environmental-economic accounting at the policy level?
See before

An EEA proposal: use the opportunity of the next global land cover map project (GLOBCOVER 2005) for starting worldwide land cover accounts.

Land accounts are currently being produced at the EEA on the basis of a satellite-based survey so-called Corine land cover 1990-2000. Land accounts inform on land cover change and frame the consistent assessment of socio-economic land use and ecosystems condition. The methodology used by the EEA follows the recommendations of the SEEA for "land and ecosystem accounting". The results of the feasibility study for Europe have been presented to the London Group meeting in Rome, 2003. The production for Europe has started early this year and provisional results can be consulted from this Internet address: http://eea.eionet.eu.int/Public/irc/eionet-circle/leac/library . Most of Europe will be covered by the end of this year.

The EEA will now test the possibility of updating land cover accounts at a semi-aggregated level, using medium resolution satellite images. The data source is the MERIS instrument of the satellite so-called ENVISAT, which will be used in 2005 for updating and considerably improving the Global Land Cover Map. The EEA proposal is therefore to profit of this opportunity for implementing land cover accounts at the global scale. These accounts will be further detailed by national or regional programmes according to priorities, using other data sources, which can be high resolution satellite images, monitoring data, samplings or local statistics.

The global land cover map 2005 will be produced with the medium-resolution imaging instrument MERIS of ENVISAT. The nomenclature that will be used is the top level of the FAO Land Cover Classification System. Although based on different principles, this system leads to a nomenclature very close to the top level of CLC used for land accounts in Europe. When coming to more detailed levels, the FAO LCCS propose a "modular-hierarchical phase" where "classifiers" are combined for producing classifications adapted to the complex reality of combinations of agricultural practices and natural conditions. Detailed levels of CLC are subdivisions of the previous one, the limitation being the possibilities of photo-interpretation of satellite images all over Europe. When the LCCS is situation specific and focuses on diversity, CLC is focused on commonalities (and therefore, the comparability of the results). Very similar as for their aggregated levels, LCCS and CLC differ when going to details but they are compatible and, to some extent, complementary.

The opportunity of GLOBCOVER will be used by the EEA for testing the possibility of updating land accounts (of course, not directly CLC for reasons of geometry). The conclusions will be valid in the case when land accounts will be produced for large countries where human activities are concentrated on a small part of the territory. In this case, combining land accounts made from MERIS (or the similar RESURS satellite) as a general background, and maps from Landsat/ SPOT/ IRS or similar satellites at the scale of 1/100000 (as CLC) or larger (e.g. 1/50000) when it is valuable gives the possibility of a cost-efficient implementation and brings together the international and the national perspectives.

The outcome of land cover accounts would be immediate for programmes such as the Millennium Ecosystem Assessment, as well as for the information systems of the

Conventions on Biodiversity, RAMSAR, Desertification, and resources such as GTOS or GRID. It could be as well an input to research programmes (e.g. IGBP/IHDP LUCC), modeling activities and economic assessments.

Land accounts can be as well a contribution to connecting GEO to the social and economic reality. GEO is an intergovernmental working group charged with developing a plan for a coordinated Global Earth Observation network providing data on environmental factors for both scientific and humanitarian purposes. GEO was created during last July's Earth Observation Summit in Washington DC and was made responsible for producing a ten-year programme to co-ordinate space and ground based global monitoring systems, to be known as the Global Earth Observation System of Systems (GEOSS).

"Through an unprecedented international collaboration, GEOSS will link data across the world, thereby providing each U.S. state with a more complete picture of global dimatic occurrences that impact their area.

Once operational, GEOSS would be capable of continuously monitoring the land, sea and air by linking data from satellites, ocean buoys, and ground-based air and water quality monitors. The tools provided by GEOSS could help states better manage watersheds, improve drinking water quality, protect the food supply, and make transportation systems safer." U.S. EPA Published: Aug 19, 2004

Global Monitoring for Environment and Security (GMES), a joint initiative by the European Space Agency and the European Union serves as Europe's contribution to the worldwide GEOSS effort. The Earth Observation Summit-III will take place in Brussels on February 2005.

Therefore, the EEA proposes to take advantage of GLOBCOVER and GEO/GEOSS for starting worldwide land cover accounts in 2005.