Environmental Accounting at Eurostat

Summary report for the 15-19 November 1999 London Group meeting in Canberra

The basis. - The 1994 Communication from the European Commission to the Council and Parliament COM(94)670 *'Directions for the EU on Environmental Indicators and Green National Accounting - Integration of Environmental and Economic Information Systems'* identified six actions, including *'continuing and enlarging work on satellites to National Accounts (natural resources accounting, environmental expenditures, etc.)*' and *'linking economic performance indicators and environmental pressure indices'*. The Council Decision 2179/1998/EC on the review of the EU's 5th Environmental Action Programme, in its Article 7 (Improving the basis for environmental policy) states: *'Particular attention will be given to (...) developing (...) satellite accounts to national accounts (...) with the aim of drawing up a comprehensive system of green national accounting...'* The Treaty of Amsterdam, in force since 1 May 1999 and amending the Treaty on European Union, strengthened environmental protection and the promotion of sustainable development as objectives of the EU and requires their integration into Community policies. The COM(94)670 and support by the European Commission's Directorates General Environment and Regional Policy allowed funding of a substantial number of pilot projects and implementation studies in Member States for each of the budget years 1996-1999. About 40 projects and pilot applications have been completed and a similar number is ongoing.

Areas of work. - The role of Eurostat is not itself to compile environmental accounts, but to encourage and co-ordinate production by the Member States. Environmental accounts work is co-ordinated with the European Environment Agency, interested Commission services, other international institutions and - within Eurostat - the units responsible for basic statistics (e.g. forest statistics, environment statistics). Eurostat is working on the following areas of environmental accounting:

- *Asset accounts* - Forests, Sub-soil assets, Land, Water
- *Emission accounts (NAMEA*) - Air emissions and energy use, Water use and pollution, Waste, Other aspects (PIOT, expenditures, taxes, land, etc.)
- *Material flows* - Economy-wide material flow accounts, PIOTs
- *Environmental economics* - Environmental expenditure, Environment industry, Environment taxes
- *Valuation/modelling* - statistics-related research with a focus on Commission activities
- *Handbooks* - Involvement in SEEA revision, European handbooks (SERIEE, Forests, etc.)

Environmental accounts development work is undertaken together with interested Member States. Task Forces have been established for Forests, Subsoil assets, Land, Water, Environmental economics (SERIEE), Material Flows. A workshop on NAMEA is organised each year (with participants from all EU Member States and EFTA countries). The results are regularly reported to, and discussed by, the Eurostat Working Party 'Economic Accounts for the Environment'.

Typically, the Task Forces start with reviewing existing experience with accounting, analyse data availability, the definitions and classifications used in basic statistics and identify policy interests. An accounting framework and set of practical implementation tables is developed and tested by volunteer countries. The test applications are analysed and the framework and set of tables refined. The results of the pilot applications as well as the final framework and set of tables are then published and the Task Force concludes its work. Regular production of environmental accounts is encouraged; and the implementation of data systems that allow regular and efficient production of the accounts is supported.

Forests. - The Eurostat Task Force on Forest Accounting developed a framework for Integrated Environmental and Economic Accounting for Forests (IEEAF) and a set of 10 main tables covering monetary and physical balance sheets for land and standing timber, economic accounts of forestry and monetary and physical supply-use tables and material balances. The tables have been the basis for a first set of pilot applications completed in 1998 and a second set completed in 1999. In addition, ad-hoc studies on the applicability and data needs of different valuation methods (and their variants) have been conducted. The results of the first set of pilot applications were published as '*The European framework for integrated environmental accounting for forests: Results of pilot applications'* in 1999.

The Task Force met three times in 1999 to review pilot applications and conclude on methods for the valuation of timber and land appropriate in different circumstances. For non-SNA functions of forests a draft classification and set of tables was developed. Monetary description of non-SNA functions remains difficult. The short-term focus will be on physical accounting and experimental valuation for carbon binding and recreational services and functional analyses of government expenditure related to recreational and protective functions of forests.

Development work being largely finalised, Eurostat will publish the *Manual for Integrated Environmental and Economic Accounting for Forests* and the results of the second set of pilot applications. Regular delivery of data on physical and monetary balance sheets and the other IEEAF tables will be integrated with Eurostat data collection activities (national accounts including balance sheets, Economic Accounts for Forestry, Forestry statistics data collection in co-operation with other international institutions, etc.).

Subsoil assets. - The Eurostat Task Force on subsoil assets concluded its work in June 1999. Work focused on oil and gas and included the definition of reserves and resource rent, calculation of values of reserves and ownership issues. A set of tables was developed and tested by volunteer countries. The Net Present Value method should be used to value reserves taking into account a standardised return to the fixed capital. Alternatively, the resource rent can be calculated based on government receipts from

resource taxes (but a crosscheck with the Net Present Value method is recommended). The Task Force also investigated subsoil assets other than oil and gas but - due to their limited economic importance - referred further work to Material Flow Accounting. The conclusions and results from pilot exercises have been made available to OECD's September 1999 depletion meeting, will be presented to Eurostat's National Accounts Working Party and published in early 2000.

Land accounting. -. In 1999 the Task Force on Land Accounting took stock of activities on Land use/ Land cover information systems and experience with land accounting and developed a draft framework and set of tables for land accounting. The starting point was the framework developed by the UN-ECE working group on Physical Environmental Accounting which includes core accounts describing stocks and flows of land use and cover, and issue-oriented supplementary accounts. The Task Force concluded that land accounting is useful because it provides a complete picture of land cover and land use for a nation; allows to derive trends and indicators of change; aids integration of diverse data sources on land cover/land use as well as other data including population, economic activity, water balances, species distribution or fertiliser use; allows to link changes in land use, land cover, habitats and biodiversity to the driving forces and can be flexibly applied at regional, watershed, landscape-type or Eco-zone level.

Our draft land accounting framework includes the classifications used, tables describing stocks in detail, two sets of tables that include flows - the first set for land use, the second set for land cover, and two tables in monetary units - an SNA asset account for the categories of land use and a detailed industry by land use account. This framework will be refined at the next meeting of the Task Force (early 2000) with a focus on classifications and on supplementary accounts. Experimental accounts are foreseen for 2000-2001 and the publication of the results and the framework in 2002.

Water Satellite Accounting. - In 1999, the Eurostat Task Force on Water Satellite Accounting continued the discussion of water accounts as outlined at the London Group meeting in Ottawa in 1997. The Task Force consolidated the framework and set of tables for Water Satellite Accounting taking into account recent results from pilot studies by Member States. The Task Force investigated the use of monetary data from the national accounts and discussed outstanding issues such as the concept of 'scarcity of water' and the linking of data on water flows between the economy and nature to a description of water in nature, building e.g. on French experience with water quality and quantity accounts. A main conclusion was that policy priorities differ across countries so that economic accounts and physical quantity as well as quality accounts need to be developed in parallel. Regionalised water accounts are important but wider implementation must wait for improvement of water statistics and the reconciliation of administrative areas normally used in regional statistics with water catchment areas (work ongoing at EU level).

Emission Accounts (NAMEA). - NAMEA is now well established in most EU Member States as a framework for presenting the contribution of industries and households to a variety of environmental concerns (emissions to air, waste water, and waste) compared to their economic performance. Some Member States have already included environmental expenditure, environment taxes, the use of natural resources (e.g. energy or water use) and land use in the NAMEA framework. A lot of interest has been shown from users towards time series of NAMEAs. A key priority for Eurostat is thus to advance

standardisation of the framework and to help harmonising the NAMEAs compiled in Member States. The inclusion of new elements into NAMEA is another key priority for the future.

Air emissions. - The results of pilot studies on NAMEAs for air emissions have been summarised in the Eurostat publication *'Pilot Studies on NAMEAs for Air Emissions - with a comparison at European Level'*. The publication compares the results from the Member States and provides detailed tables for several pollutants. At the November 1998 NAMEA workshop the methods and definitions for compiling NAMEAs for air emissions were a main topic. This area is now moving from the pilot into the implementation phase with regular collection of NAMEA air emissions data from Member States.

Water. - Several Member States have carried out pilot studies leading to a number of reports focusing on different parts of the framework (water abstraction and use, water pollution, etc.). The results are normally presented as part of the NAMEA framework but are at the same time designed to test different parts of the tables of the water satellite accounting framework (see above).

Waste. - Several Member States have included data on waste generation in their NAMEAs but outcomes differ to some extent as data availability does not allow allocation of waste data by industries in all Member States. Data availability will improve with the finalisation of an EU Regulation on waste statistics.

Material Flow Accounts (MFA). - Beyond material flows included in natural resource accounting (e.g. forest accounts) and NAMEAs (e.g. use of energy and water or emissions generated) work focuses on Physical Input-Output tables (PIOT) and Economy-wide material flow accounts. PIOTs are IO tables in physical units and are a very comprehensive but labour intensive approach. Eurostat does not work towards having PIOTs for all Member States. Many elements of a PIOT are already present in NAMEA. PIOTs can be used as a production tool for NAMEAs.

Economy-wide material flow accounts are aggregate descriptions of the total material throughput of economies. Important material categories are construction materials, fuels and biomass. Most basic data are available from statistics on production (agriculture, forestry, mining, manufacturing and construction), foreign trade, energy, waste, water and air emissions. These data are then integrated and made consistent. Economy-wide material flows are a useful long-term indicator for resource productivity and have attracted policy interest in Member States (and some have set reduction targets for material flows).

The publication in 1997 of 'Resource Flows: the material basis of industrial economies' (by World Resource Institute, Wuppertal Institute, Dutch Environment Ministry and Japanese National Institute for Environmental Studies) attracted high-level policy interest. Currently, a follow-up of that study is ongoing which focuses on the output side (i.e. the emissions, waste generation, dispersive uses and additions to the stock of infrastructure and machinery). This represents an important step towards linking quantities of materials flow with their environmental impact. Final results are expected for late 1999. Eurostat is associated with this international project as an observer.

Eurostat is developing a framework and recommendations for economy-wide material flow accounts that aims at harmonised terminology, coverage, categories of materials to be distinguished and practical compilation and estimation procedures. A project is ongoing to establish economy-wide material flow accounts EU-wide.

Environmental Protection Expenditure Accounts. - The framework (SERIEE 1994 version) was tested in many Member States and other countries. EU-wide implementation of the EPEA will be facilitated once relevant developments in the standard statistical system are completed (revision of the national accounts including new COFOG, environmental expenditure variables in the EU's Structural Business Statistics Regulation, business registers (e.g. NACE/ISIC 90), etc.). Eurostat focuses on continuation of pilot applications by volunteer countries, methodological development (e.g. resource management expenditure) and production of a compilation manual to the SERIEE handbook. An interesting aspect are capital stock models which are used to estimate the environmental capital stock, the consumption of fixed capital as well as operating expenditure.

Environmental taxes. - The basic framework was established in 1997 in co-operation with other Commission services, IEA and OECD. Political interest is high in economic instruments for environmental protection (taxes, fees, state aid, pollution charges, deposit-refund systems, etc.). Studies of environmental taxes are available for virtually all Member States. Some Member States have started to publish their results regularly. Environmental tax revenue data are published annually by Eurostat in co-operation with the Directorate General Taxation and Customs Union.

Environment Industry. - This activity focuses on the supply side aspect of environmental protection. Political interest is high (environmental jobs, export markets, etc.). This area integrates data from standard statistics, environmental expenditure and surveys of producers of environmental goods and services in a satellite accounts approach. *'The Environmental goods and services industry: Manual for data collection and analysis'* was published in conjunction with OECD in 1999. Several studies have recently become available for individual Member States and at EU level.

Valuation and modelling. - Eurostat is following up several research projects led by the Directorate General 'Research'. A project of particular relevance for environmental accounting was GREENSTAMP (GREEned National STAtistical and Modelling Procedures). This project focused on various aspects of producing 'Greened' National Accounts aggregates and concluded that such aggregates are most useful when resulting from modelling exercises including co-operation of policy makers, statisticians and modellers. Environmental accounts are essential inputs into such modelling work. A Workshop 'From research to implementation: policy-driven methods for evaluating macro-economic environmental performance' was organised in Luxembourg, 28-29 September 1998 jointly by the Directorates General 'Environment' and 'Research', the European Environment Agency and Eurostat. The proceedings from that workshop have been published (European Commission 1999).

Future directions. - So far work has largely focused on developing and testing frameworks and methodologies for different areas of environmental accounting. A substantial body of data has become

available as well. The various areas are in different states of maturity:

Mature or nearing maturity	Further development and testing
NAMEA air	NAMEA water
Forest accounts	Forest accounts (non-ESA part)
Environmental protection accounts	Environmental valuation & modelling
Material flow accounts	Water accounting
Environmental taxes	Land accounting
Subsoil asset accounts	NAMEA waste
Environment Industry estimates	

In the more mature areas frameworks and methods have been developed and their applicability demonstrated in practice. For these, the focus will shift to supporting systematic implementations in Member States so as to allow generating results more regularly and at lower costs. Systematic implementation includes the production of *operational guidelines* so as to facilitate and automatise production of environmental accounts, analyses and re-processing of historical data so as to *establish long time series*, adjustment of existing *surveys* and establishment of regular *co-operation and data exchange* with other institutions (Environment Agencies, Forest Institutes, etc.),