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**UNITED NATIONS ENVIRONMENT PROGRAMME
(UNEP)**

**Environment and Economics Unit
(EEU)**

**WORKSHOP ON ENVIRONMENTAL AND NATURAL RESOURCE
ACCOUNTING WITH PARTICULAR REFERENCE
TO COUNTRIES IN TRANSITION TO
MARKET ECONOMIES**

Report of the Meeting

March 1994

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The views and interpretation reflected in this document are those of the authors and do not necessarily reflect an expression of opinion on the part of the United Nations Environment Programme

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TO COUNTRIES IN TRANSITION TO
MARKET ECONOMIES**

Modra-Harmonia (Slovak Republic)
21-23 March 1994



*Report of the Meeting
Hussein Abaza and Bernd Schanzenbacher
Meeting Organizers and Rapporteurs*

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Introduction

1. The Workshop on Environmental and Natural Resource Accounting with Particular Reference to Countries in Transition to Market Economies was held in Modra Harmonia, Slovak Republic, from 21 to 23 March 1994. The Workshop was convened within the framework of the joint United Nations Environment Programme (UNEP) and United Nations Statistical Division (UNSTAT) work programme on environment and natural resource accounting. It was organized in close collaboration and consultation with the United Nations Economic Commission for Europe (ECE).
2. The Workshop was attended by 34 environmental and statistics experts from Central and Eastern Europe. The countries represented were Armenia, Belarus, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, the Republic of Moldova, Poland, Romania, Slovenia, the Slovak Republic and the former Yugoslav Republic of Macedonia. Representatives and resource persons from France, Germany, Italy, Norway, the Netherlands, ECE, the Organisation for Economic Cooperation and Development (OECD), UNEP and UNSTAT also attended the Workshop. A list of resource persons and participants is attached as Annex II to this report.
3. The Workshop was opened by Mr. Rudolph Krc, President of the Slovak Statistical Office, who welcomed the participants. He stated that this Workshop was of special interest to countries in transition to market economies (CITS), since the problems of managing and passing legislation on environmental issues were quite new for these countries. There was no tradition of dealing with environmental problems in the official statistics of States in Central and Eastern Europe. Mr. Krc expressed his wish that the Workshop would bring to light new experience in the field of natural resource accounting, for the benefit of all participants.
4. Mr. Hussein Abaza, Chief, Environment and Economics Unit, UNEP, Nairobi, in his opening remarks expressed his thanks to the Statistical Office of the Slovak Republic for their work in organizing and hosting the Workshop. He explained that one important aim of this Workshop was to identify the needs of CITS related to environmental and natural resource accounting (ERA). This included human, institutional and financial requirements for the introduction of ERA. He stated that this Workshop was being convened as part of the UNEP Programme for Central and Eastern European Countries set up in response to the decision of the Governing Council of UNEP at its seventeenth session. It further reflected the resolve of United Nations agencies to collaborate in assisting CITS in their development efforts.

Session 1: Objectives and Policy Uses of Integrated Environmental and Economic Accounting

5. Mr. Peter Bartelmus, Officer in Charge, Environment and Energy Statistics Branch, UNSTAT, New York, presented a paper entitled "Objectives and policy uses of integrated environmental and economic accounting". He referred to the leading role played by UNEP, not only in environmental issues but also in problems related to sustainable development,

since its establishment after the Stockholm Conference on Environment and Development in 1972, and specially since the Earth Summit in Rio de Janeiro in 1992. He emphasized that the economy influenced the environment and vice versa. The use of monetary units seemed to be the best way to measure negative impacts on the environment. There existed many environmental indicators to describe the state of the environment, but what was needed was an indicator that could be used by policy makers.

6. Mr. Bartelmus outlined the two major drawbacks of the System of National Accounts (SNA) in relation to the environment. One was that SNA did not take into account waste and depletion of natural resources. As a consequence, wrong decisions could be made. Another drawback was that expenditures spent for the purposes of environmental protection or waste management was increasing the gross domestic product (GDP). However, that expenditure was not seen as restoring changes from past economic action. The effect should be to decrease GDP, and not to increase it.
7. He then gave an overview of the System of Environmental and Economic Accounting (SEEA). The objectives of this approach were:
 - (a) segregation of environmental information,
 - (b) linking of physical and monetary accounting and statistics,
 - (c) assessment of environmental costs and benefits,
 - (d) accounting for maintenance of national wealth, and
 - (e) environmentally adjusted "green" indicators.
8. Mr. Bartelmus pointed out that SEEA applied different costing approaches for the assessment of environmental costs and benefits. The methods used were market valuation, maintenance cost valuation and contingent valuation. Market valuation was used to segregate environmental expenditures and the imputation of environmental costs for economic asset use. Maintenance cost valuation was used to assess changes in environmental quality and other non-economic asset use. It was acknowledged that there were also limitations to those valuation techniques. Non-economic values, such as health, equity or culture, were not addressed by the above valuation methods. Other constraints included the inconsistencies of these valuation techniques.
9. After the valuation of natural assets and the incorporation of the results in a so-called "green" GDP, the question of the use and interpretation of these results arises. Could the results have any policy uses and applications? At a macroeconomic level, changes of specific indicators such as capital stock (CAP)/net domestic product (NDP) or NDP/CAP could be determined. On the basis of such indicators and their changes, with the inclusion of environmental impacts in accordance with a green accounting approach, it is possible to determine the most serious and expensive environmental hazards. At a microeconomic level, "green" accounting enables scientists to allocate costs to the person or persons causing such external effects.

10. Mr. Bartelmus pointed out that there were two valuation methods for the maintenance of natural capital as a production factor, proposed in SEEA. The first was the *net price method*, which was developed and applied by the World Resources Institute (WRI). This method measured the net reduction in a natural resource beyond regenerative capacity, net of all costs including an allocation of normal profit. The second method, the *user cost allowance*, was developed by Mr. El Serafy of The World Bank and was based on the concept of investing a portion of the income received from the depletion of an asset in order to generate a permanent stream of income in the future.

Session 2: Integrated Environmental and Economic Accounting

11. Session 2 opened with a presentation by Mr. C. Stahmer, Chief of Division for Input-Output-Analyses, Federal Statistical Office, Germany. He gave a brief account of SEEA. He stated that the revision of SNA provided an opportunity for the incorporation of environmental considerations into the core framework of national accounts. The United Nations Statistical Commission had identified that a system of integrated accounting would be a good complement to the core SNA. As a conceptual framework for implementing SNA for integrated accounting, a handbook on SEEA was published in 1993.
12. An introduction was given on valuation principles for environmental cost. There were two different approaches which differed fundamentally. The first one was the *costs borne approach* and the second one was the *costs caused approach*. The two differed in terms of the time and the space taken into account for valuation purposes. In the first case, only domestic natural environment was taken into account, whilst the second method also focused on environmental impacts abroad. The linkage between these two types of cost was very difficult, since in most cases impacts caused long-term problems on an international scale. These transboundary effects were becoming more and more important, since developed countries tended to export their environmental problems to developing countries by importing goods whose production caused environmental problems for those countries. On the other hand, industrialized countries had been exporting their toxic waste to developing countries, which had to deal with the problem of their disposal.
13. Different methods could be used to value environmental costs. These methods were neither complementary nor exclusive, since it was almost impossible to identify the true value of the natural environment. A market value could be estimated if there was a market price available for an environmental commodity or a non-produced natural asset. In most cases such a market value did not exist, e.g. when a commodity was not marketed (for example air quality). In these cases, indirect methods for measuring the changes in the environmental service had to be used. The method used for estimating the costs for non-market goods was *contingent valuation*, by applying the *willingness-to-pay approach*. Here consumers were asked how much they were prepared to pay for a better or healthier environment. Another approach was to use a questionnaire, where people were asked to what extent they would reduce their consumption in order to achieve fewer environmental hazards.

14. Mr. Stahmer emphasized that under a strong sustainability concept, natural capital should remain untouched. Different types of natural capital would, however, be substituted for one another. The most suitable valuation methodology to be used here was the *avoidance cost method*, where the avoidance costs were the expenditures necessary for sustainable development. Estimating the avoidance cost was not easy and usually required extensive modelling at micro- and macroeconomic levels, with the comparison of different strategies.
15. It was also necessary to consider the negative environmental impacts of international trade in the calculation of "green" accounts. To estimate the environmental costs of trade for the importing and exporting country, an input-output analysis had to be carried out and the net domestic product (NDP) of each country had to be adjusted accordingly.
16. He stated that it was easy to develop concepts, but difficult to implement them. SEEA provided a good framework and a flexible system for "green" accounting. For the implementation of this tool, two conditions had to be fulfilled. First, a list of the most important problems should be prepared. After that the data required and data currently available should be compared. In many cases, especially where CITS were concerned, it could be helpful to start with the physical data which was readily available and to convert those to monetary units at a later stage. The possibility of building different blocks within SEEA, which could be used independently from one another, increased the flexibility of the system.
17. Mr. Stahmer concluded by stating that transboundary effects were not included in SEEA thus far, and should be the focus of future work in that field. He emphasized that close cooperation between environmentalists and economists was necessary for SEEA, as knowledge from both sides and the participation of open-minded specialists in both areas were essential. Focusing on the most important environmental problems caused certain difficulties, since it was not easy to make a list of priorities. It was possible that some problems were not recognized because they were thought to be minor, but under closer scrutiny it transpired that, they could cause major monetary losses. To avoid that situation, it could be helpful to conduct a pilot study first, before embarking on a major study. It was also necessary to be flexible in setting priorities according to the findings of the case study or changing conditions in the site itself. It was suggested that CITS should begin work in three different fields: depletion of resources; land use; and degradation by pollution. Bureaucracy was recognized to be a major problem, especially in CITS. It was acknowledged that the submission of baseline data was an essential prerequisite for environmental and natural resource accounting. From this baseline, the system could generate the data necessary for environmental and natural resource accounting.
18. Mr C. Costantino, Officer in Charge, Italian National Statistical Office, presented his paper on "Physical Environmental Accounting in the context of SEEA". He stated that the use of physical units had a long tradition in the field of environmental accounting, *i.e.* material/energy balances (MEB), or the natural patrimony system (NPS). Since these methods usually followed a stand-alone method, there was demand for a more integrated approach, such as SEEA. The presentation focused on environmental accounting in physical

terms within SEEA. Since the "cost caused" concept is a high priority area in the SEEA framework, the paper focused on the physical aspects related to this concept. In SEEA there was no comprehensive description of the natural environment. This concept focused mainly on the interrelationships between the economy and the environment described in physical units, which showed flows of natural resources from the environment to the economy. Physical units were only an intermediate step, providing links with the monetary flows and assets of SEEA. Physical terms were necessary for the provision of information on the use of non-produced natural assets, the depletion of natural assets, the spatial extent and quality of land use and landscape, the use of the environment for assimilating the residuals of economic activities and the physical data related to the treatment of those residuals.

There were three sets of flow accounts:

- * Product flow accounts (showing the supply and use of products)
- * Raw material flow accounts (showing the origin and destination of raw materials)
- * Residual flow accounts (showing the quantity and type of residuals)

19. It was pointed out that there was a need for the further study and improvement of the physical accounts within the SEEA framework. It was suggested that the following topics should be addressed:

- * defining at a more operational level the specific nature of environmental problems which must be resolved if our vital natural resources are to be maintained;
- * developing indicators of the qualitative characteristics of non-produced natural assets;
- * highlighting the dynamic aspects of environmental problems (e.g. considering the time-lags between the discharge of residuals and the ultimate loading of natural assets).

20. The Task Force of the Conference of European Statisticians (CES) has carried out methodological work on environmental accounting in physical terms. Two pilot groups had been set up to deal with the topics "Changes in land cover and land use" and "Nutrients in the environment". Both pilot groups were to indicate in each case:

- * actor accounts needed;
- * stocks and flows subject to accounting of their corresponding units;
- * movements between different environmental media changes in relevant environmental conditions;

* derivation of aggregate environmental indicators.

21. The CES Task Force emphasized that human activities (and their impact on the environment), material flows and environmental effects should be the main building blocks for environmental accounts in physical terms. The accounting framework in which the two pilot groups were working was divided into "core accounts", covering land-use statistics and related activities, and "supplementary accounts", relating to the pilot study on changes on land use, which covered such aspects as the sealing of soil, biological diversity in rural areas and the impact of tourism. As far as the nutrient study was concerned, "supplementary accounts" focused on such points as extractions, imports and exports, as well as environmental quality indicators which could be linked to these topics. Initial results from these pilot studies are expected by the end of 1994.
22. The discussion opened with the observation that, while the total amount of pollution was of importance, even greater importance could be attached to the length of time during which human beings and biota were exposed to the pollution. The physical units used to describe the state of the environment had to be further refined by multiplying the exposure time by the intensity per unit.
23. It was stressed that different regions could have totally different problems. It was suggested that the solution to such problems was to start with a system of core tables and then to add more tables for specific regional needs.
24. It was noted that environmental information presented in physical units could be a very helpful tool for decision makers. A certain amount of information on environmental indicators as well as sustainable development could be obtained without converting physical units into monetary units.

Session 3: Environmental statistics and natural resource accounting

25. Session 3 opened with a presentation from Mr. Kahnert, Officer in Charge, Statistics Unit, United Nations Economic Commission for Europe (ECE). He reported briefly on environmental statistics, natural resource accounting and the ECE programme in this field. An important question was raised concerning the advantages of environmental accounting over other alternatives. It was stressed that environmental statistics had to cover both subjects: resource and pollution statistics. Where resource statistics was concerned, at present the focus was on such environmental resources as water, flora and fauna. Pollution statistics, on the other hand, concentrated on traditional environmental media. The general softness of the data was a common problem in environmental statistics. The best way to deal with this was to present the data in a clear and easily understood way, instead of developing more sophisticated statistical methods.

The characteristics of environmental information were:

- * Time and site specificity
- * Wide diversity of observation measurement units in use
- * Quality orientation (was not stressed in the past)
- * Conceptual undercoverage
- * Diversity of data sources
- * Need for interpretation
- * General softness
- * Suitability for computer processing

The functions and characteristics of statistics were:

- * Generalization
- * Systematic linkages and data integration
- * Time series orientation
- * Data quality assessment
- * Application of scientific methods in the collection and compilation of data

The current approaches to environmental statistics were:

- * Environmental accounting
- * Stress-response model
- * Sectoral models
- * Aggregated indicators - suitable and easy to interpret
- * Geographical Information Systems (GIS) as a highly qualified tool for obtaining and compiling environmental data - not necessarily a practical solution for CITS

26. There were various different methods of environmental accounting currently in use. These include: (1) material and energy balances, which had been in use since the early 1970's, though mainly applied to waste statistics and considered too labour-intensive. (2) Norwegian resource accounting; (3) French patrimony accounting; (4) satellite accounts to national accounting. There were close similarities between the Norwegian and French systems. The Norwegian system started with SNA, with the intention of dealing with environmental accounting. The French system began with environmental accounting and its linkage to SNA.
27. Mr. Kahnert was of the opinion that much information was gained by calculating environmental issues in monetary terms and warned that this approach might divert us from addressing environmental problems. Since physical units had been used to calculate national accounts in CITs in the past, this could prove to be a good starting point for future work in the field of environmental accounting.
28. It was concluded that material balances were quite often used in national environmental accounting systems, e.g., in Norway and the Netherlands. During the discussion, it was agreed that the use of aggregated environmental indicators was necessary, although the meaning of each single indicator had to be carefully defined. Attention was also drawn to the need to limit the number indicators used to describe the state of the environment in order to avoid confusion and misunderstanding.
29. It was also stressed that there was no way of carrying out the monetary accounting of environmental issues without the use of physical units. It was found that physical accounting was necessary for monetary valuation. It was also pointed out that there was no automatic need to convert all physical data within an accounting system into monetary units. Physical data could form the main part of a system of environmental accounts, since it was easier to deal with data of that kind.

Session 4: Natural patrimony accounting system

30. Mr. Weber, French Institute on the Environment, gave an account of the French patrimony system. During the 1980s, the French Government had identified that the then current system of national accounts was not very useful for policy advice, since it failed to take into account the environment and parameters for sustainable development. Following an integrated approach, the French patrimony system required a wide range of skills and in the beginning involved many different ministries. The aim of this system was to start first with physical accounting and then, in next phase, to transfer these results into a monetary framework.
31. The Natural Patrimony System (NPS) had two different dimensions. The first covered such topics as consistency of data, integration of different physical data and efforts to identify the most suitable way of collecting data. The second dimension aimed to provide aggregated indicators to decision-makers. In this undertaking, modelling was widely used

as an assessment tool to find the most suitable strategy for solving problems and also for forecasting.

32. The natural patrimony system dealt with three types of accounts, since it was found that it was not very effective to operate with one account only. These included:
- * Actor accounts, which had some similarity to natural balances and physical accounts.
 - * Element accounts, which covered the changes in natural resources, flora and fauna and physical media.
 - * Ecozone accounts, which described the stocks and flows relating to ecozones, e.g., changes in land use.
33. This core system of the NPS had to be connected to the national accounts and other socioeconomic statistics. Country studies on the application of the French system had been initiated and results were expected by the end of this year.
34. During the ensuing discussion, the question of whether there would be a further improvement in the water statistics of the natural patrimony system arose, since only stocks, consumption and water flows had so far been measured. To date no research had been conducted on internalization of the costs of water pollution. It was pointed out that a large part of NPS had been taken over by Eurostat in its System of Economic Information on the Environment (SERIEE). Within the SERIEE framework, considerable importance was attached to waste and waste management and research would focus on this topic with the aim of establishing a proper price for water.

Session 5: Natural resource accounting - the Norwegian approach

35. Mr. Saebo presented an overview of the Norwegian natural resource accounting system, based on principles, structure, use and experience. Natural resource accounting in Norway had been introduced in the 1970s, and the first resource accounts were established in the early 1980s. The Norwegian approach distinguished between material resources, such as forestry or fishery and environmental resources, such as emission accounts. The main focus in Norway was on material accounts which gave a survey of stocks, extraction and use of natural resources. The results of these accounts were used in input-output models to provide information for decision-makers. Examples of different accounting tables were demonstrated during the presentation. The Norwegian resource accounts were mainly maintained in physical units.
36. The question of how to calculate the benefits of reducing NO_x emissions by a given amount was discussed. While making such an estimation was rather difficult, one possible method would be to base it on the willingness to pay in principle. Another suggested

solution derived the costs from the damage caused by 100 per cent emission. If the emission was reduced by 20 per cent, the damage costs would similarly be reduced by 20 per cent too. This figure represented the benefits measured in monetary terms.

37. Another topic brought up during the discussion was the problem of distinguishing between reserves and resources. For some natural assets, e.g. fishery and forestry, it was hard to tell which figures were reserves and which resources. In such cases, a more pragmatic approach was necessary.
38. It was emphasized that environmental and natural resource accounting should focus on physical accounts. If appropriate valuation techniques were available, these could be converted to monetary units.

Session 6: SNA and environmental accounting

39. Mr. van Tongeren, Officer in Charge, Accounting Division, UNSTAT, New York, gave a presentation on "System of National Accounts and Environmental Accounting". He stated that there could be no environmental accounting system which had no connection to a core system of national accounting. This exercise was rendered rather difficult by the large amount of institutions involved. This was reflected in the fact that it had taken nearly ten years to get agreements on the revised version of SNA and for it to be adopted in 1993. The process of revising SNA had been interrupted twice during that period. One such interruption has been caused by the changes in the former Soviet Union and other states in Eastern and Central Europe. This development was taken into account during the revision of SNA. Another important issue was the integration of environmental impacts of economic activities into the core accounting systems.
40. It was stated that many OECD countries did not have very detailed and complete balance sheets and CITS should not be expected to have complete sheets ready in the near future. It was suggested, however, that all available information should as far as possible, be transferred to the SNA framework. It was observed that even in the revised version of SNA, damage costs were still treated in the previous way. Expenditures, for example, for sewage treatment would increase GDP, although from an environmental point of view this was totally wrong.

Session 7: Natural resource accounting - the Netherlands approach

41. Mr. De Haan, Statistics Netherlands, Voorburg, presented a paper entitled "Natural Resource Accounting - the Netherlands approach". The linkage between economic and environmental data, on the one hand, and the national accounts, on the other, was often limited to the production accounts. It was argued that the consequences of economic actions on ecosystems and vice versa did not only relate to production processes, but also to other parts of SNA. The concept module presented in the first sections of this paper

distinguished between the two types of environmental matter accounts (including 'free' gifts of nature as well as various types of 'free' disposal) and environmental assets accounts (i.e. ecosystems). The first step should be to relate volume flows of environmental matter to the standard economic accounts. This was done in a so-called National Accounting Matrix including Environmental Accounts (NAMEA),⁵ a format which incorporated all simplified accounts of the next SNA in a flexible way.

Session 8: Implementation of SEEA: experience gained from country projects

42. During this session Mr. Bartelmus presented results of a case study on the application of the SEEA framework in Papua New Guinea. He gave an overview of institutions involved in research and the application of natural resource accounting. He also presented a short summary of the outcome of the Expert Meeting on "Green Accounting" held in London on 17-18 March 1994.
43. The main purpose of the case study in Papua New Guinea was to test the methodology and identify data gaps, rather than to attempt an accurate assessment of the trends regarding key modified economic indicators in that country. It was pointed out that data sources constituted the key problem during the country study. Although data existed, they were often dispersed, fragmented, and difficult to generalize and synthesize. Data differed by a factor of ten, depending on the data source. It was also pointed out that it was very important to draw up a list of major environmental concerns before starting the study. This list of priorities would be subject to change, because a minor environmental problem could sometimes cause major monetary expenditures and such eventualities were difficult to foresee.

Session 9: Short country presentations: environment, growth and development

44. Country presentations were made by the participants of the workshop. They gave a brief overview of the activities and problems relating to natural resource accounting in the countries concerned.

Armenia: NRA was a new field for Armenia. The workshop represented a good opportunity for introducing the subject in Armenia. The Ministry of Environment, which had established the previous year would be involved in that exercise.

Belarus: Since 1992, the International Ecological Council has been located in the capital, Minsk. The main objective of this Council was the coordination of environmental activities within CITS.

Bulgaria: Bulgaria had already started to collect data on environmental topics. In the long run, those data were to be compiled and stored with a Geographical Information System (GIS). There was a pressing need in Bulgaria for information on how to link physical and

monetary data. Its most important environmental hazards were identified as: air pollution, water use, waste problems and manure from the agricultural sector.

Czech Republic: The Czech Statistical Office and Charles University had a joint project on the integration of environmental statistics in national accounts. The Dutch Government was providing assistance in that activity.

Estonia: The gathering of environmental data had commenced in Estonia in 1957. The country's current efforts to process and compile data were mainly impeded by lack of human resources.

Georgia: In Georgia, the Ministry of Environment and the Socioeconomic Information Committee had been involved in providing environmental statistics. The quality of the data was still quite low, however.

Hungary: In Hungary the only environmental data expressed in monetary terms were those relating to investments for environmental protection. The Statistical Office carried out an annual survey of investments for the protection of land and soil.

Latvia: The main problem in Latvia was the impact of its aging industries on the environment. Since there was abundant data available, it was planned to use GIS to compile and process data, in order to strengthen activities in the Statistical Office. An Environmental Department had been established since collaboration between different ministries which could provide environmental data, had been very difficult to arrange.

Poland: Between 70 and 75 per cent of the environmental data were collected and stored by the Statistical Office. The statistical data primarily related to air and water pollution. There was an environmental funding system to finance activities for environmental protection. Poland would like to work closely with Italy in this field.

Slovenia: Slovenia had already started working on environmental accounts. After preliminary studies of the different approaches, it had been decided to use a combination of all approaches specially tailored to Slovenia's needs. Future work planned in the area included: (1) using environmental information to estimate the effects of different macroeconomic policies; (2) making one department in the Statistical Office responsible for all physical data on the environment.

Romania: An environmental law was under preparation, demonstrating that environmental protection and efforts to enhance the environment were a national priority. It was also planned to use environmental data to support decision-making in macroeconomic policies.

Sessions 10 and 11: Future programmes, conclusions and recommendations

45. There had been general consensus at the United Nations Conference on Environment and Development (UNCED) that interactions between the economy and the environment must be taken into account in policy advice on sustainable development. The use of Integrated Environmental and Economic Accounting (IEEA) had been identified in Agenda 21 (the Action Plan of UNCED), as a way of linking economic data with environmental information.
46. The workshop concluded that physical databases were important both for the direct monitoring and for the evaluation of stocks and flows related to the state of the environment. Physical data were also needed for further monetary valuation. Since there had been extensive physical data collection on material flows of some produced and non-produced assets in the former Eastern and Central European countries, those databases would facilitate the launching of IEEA programmes in those countries.
47. The 1993 SNA and the forthcoming handbook on SNA for transition economies provided an appropriate framework for those initiatives which should be implemented in the form of satellite systems. The new SNA already addressed the stocks and uses of natural produced and non-produced 'economic assets', in so far as they were valued in market prices. The expansion of SNA to include non-economic 'environmental assets' - their depletion and degradation was considered necessary to provide important information for the assessment of sustainable economic growth and development in transition economies. Further research on that topic was necessary and revisions of the proposed concepts and methods of environmental and natural resource accounting were anticipated.
48. For the initial setting up of national accounts, data were normally compiled by the statistical offices themselves. Further information was, however, needed from other sources as well. There was a strong requirement for collaboration between scientists, economists and statisticians. In consequence, the ministries of environment, economy, finance and other governmental and nongovernmental organizations would have to work together and in close cooperation with the statistical office in order to obtain the broad range of data required for IEEA.
49. For progress in the field of IEEA, international and multilateral organizations should assist national work by backstopping country projects and organizing training workshops in that field. Such support would facilitate the future methodological improvement of IEEA as well as the identification of data availability and needs for the implementation of high-priority elements of IEEA.
50. IEEA was considered to be an important tool for identifying environmental problems and providing a framework for the adoption of sustainable development policies. It should be noted, however, that there were still some limitations to the use of that tool. One such limitation was the lack of a consensus on the valuation of environmental assets and asset use. Another was that IEEA did not address significant aspects of sustainable development, such as equity, health, culture and other social considerations.

51. *IEEA not only described past economic statistics and their impact on the environment, but also provided the necessary data base for modelling. Such modelling could express relationships among observed data and their valuation. It could also assist in specifying the level and limits of natural resource use in achieving sustainable development and in assessing the costs of the environmental and economic impact of different macro- and microeconomic policies. The former should lead to environmentally sound activities in such areas as trade, investment and economic growth. The latter would permit a rational application of economic instruments, such as green taxes, tradable pollution permits or refund systems.*
52. The meeting emphasized the need for further exchange of information on, and experience in, IEEA and the related development of environmental statistics and indicators. It also called for efforts to strengthen cooperation between the countries of Central and Eastern Europe.

ANNEX I
ANNOTATED AGENDA

ANNOTATED AGENDA

MONDAY, 21 MARCH 1994

- 9:00** Registration
- 9:30** Opening of the meeting, introduction and welcome by the host country representative, and by UNEP, ECE and UNSTAT representatives.
- 10:00** ***Session 1: Objectives and policy uses of Integrated Environmental and Economic Accounting*** (Mr. P. Bartelmus, UNSTAT)
Objectives of green accounting; presentation of the System of Integrated Environmental and Economic Accounting (SEEA) as an offshoot of the System of National Accounts (SNA); accounting for sustainability in growth and development; accounting for accountability (environmentally sound production and consumption patterns); the limits of monetary valuation; complementary data systems.
- 11:00** ***Coffee break***
- 11:30** ***Session 2: Integrated Environmental and Economic Accounting*** (Mr. C. Stahmer, Federal Statistical Office, Germany)
Structure and contents of the Handbook on the System of Environmental and Economic Accounting; valuation; stepwise implementation; extensions of production boundary.
- 12:30** ***Lunch***
- 14:30** ***Session 2 (continued): Integrated Environmental and Economic Accounting*** (Mr. C. Costantino, Italian Statistical Institute, National Accounting and Environment Statistician)
Physical requirements for SEEA
- 15:30** ***Coffee break***
- 16:00** ***Session 3: Environmental statistics and natural resource accounting*** (Mr. A. Kahnert, ECE)
The ECE programme on environmental statistics and natural resource accounting; environment statistics as a data source; status of implementation of ECE programme; future activities.
- 17.00** ***Close of Session***

TUESDAY, 22 MARCH 1994

- 9:00 **Session 4: Natural patrimony accounting system**
(Mr. J.L. Weber, Institute of the Environment, France)
Structure and content of the French natural patrimony account system, gaps and limitations, etc.
- 10:00 **Session 5. Natural resource accounting - The Norwegian approach**
(Mr. H. Saebo, Statistics Norway)
- 11:00 **Coffee break**
- 11:30 **Session 6. SNA and environmental accounting**
(Mr. J. van Tongeren, UNSTAT)
Revision of SNA; coverage and treatment of natural resources in SNA; balance sheets of natural assets; valuation and analysis; linkage with SEEA; implementation of SNA in transition economies.
- 12:30 **Lunch break**
- 14:30 **Session 7: Natural resource accounting - the Netherlands approach**
(Mr. M. de Haan, Statistical Office of the Netherlands)
Future programmes and country projects
- 15:30 **Coffee break**
- 16:00 **Session 8: Implementation of SEEA: experience gained from country projects**
(UNSTAT, World Resources Institute, World Bank, UNDP)
Problems encountered and solutions; comparative valuations; results and data gaps; follow-up.
- 17:30 **Close of session**

WEDNESDAY, 23 MARCH 1994

- 9:00** *Session 9: Short country presentations: environment, growth and development*
- 11:00** *Coffee break*
- 11:30** *Continuation*
- 12:30** *Lunch break*
- 14:30** *Session 10: Future programmes and country projects*
- 15:30** *Session 11: Conclusions and recommendations*
- 17:30** *Close of Meeting*

ANNEX II

LIST OF RESOURCE PERSONS AND PARTICIPANTS

**List of Resource Persons and
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