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**MEASURING SUSTAINABLE DEVELOPMENT:
ACHIEVEMENTS AND CHALLENGES**

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This document was prepared to support discussions at the UNECE Conference of European Statisticians Seminar on Measuring Sustainable Development (Geneva, 14 June 2005) and at the Oslo Conference on Sustainable Development Indicators (Oslo, 20-21 June 2005) organised by the Norwegian Ministry of Finance in co-operation with the OECD. It was also made available at the OECD's Annual Meeting of Sustainable Development Experts (Paris, 3-4 October 2005), and will be released as an OECD Statistics Working Paper.

The document gives an overview of the OECD's approach to the measurement of sustainable development and related work carried out since 1997. It draws heavily on a number of OECD documents and publications that are referred to under "References and bibliography".

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Achievements and challenges**

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1. Policy Context and the OECD Work on Sustainable Development

Policy context

1. The concept of sustainable development is concerned both with the quality and the quantity of economic growth and encompasses three dimensions of welfare — economic, environmental and social. It refers first to “needs” in a broad sense, not only economic needs but also needs for a clean environment, for a secure and cohesive society and for ample employment opportunities. Second, explicit in the concept is a focus on “inter-generational” equity, implying that the next generation should be secured opportunities similar to those available to the current one. Third, it puts an emphasis on equity that applies both across and within countries.

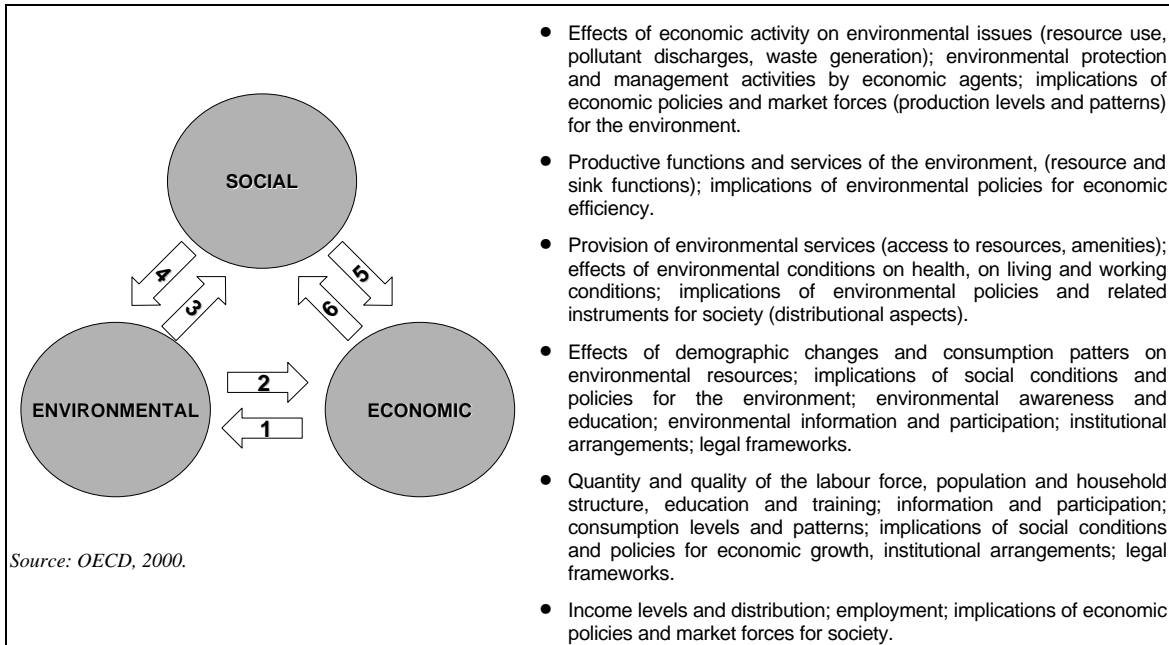
2. Progressing towards sustainable development implies that the objectives of increasing economic efficiency and material wealth must take into account social and environmental objectives and must be placed in an inter-temporal framework. It also implies that the capital or asset base of our economies and societies is preserved; this is a key determinant of the potential to satisfy the needs of the present and the next generation. It includes natural assets (natural resources and environmental assets); produced assets and financial assets; and human and social assets (health, education, social institutions, networks and norms).

3. Making the concept of sustainable development operational for public policies raises important challenges that involve complex synergies and trade-offs. Many options for making use of synergies can only be identified if all three dimensions of sustainable development are taken into account. Progress towards sustainable development thus depends on understanding the interactions among these dimensions and their complementarities (Box 1). Lessons drawn from the OECD’s work on sustainable development and country peer reviews have highlighted the need:

- to step up the coherence and integration of government policies and move beyond a sectoral approach to a more integrated and participatory approach;
- to make greater use of market instruments; and
- to strengthen international co-operation (OECD 2001a, 2004c).

4. This needs to be supported with appropriate monitoring to gain policy feedback and promote accountability, and with the availability of statistics (especially indicators) that inform policy makers and the public about the inter-linkages and trade-offs among the various dimensions of sustainable development, the longer term implications of current decisions and behaviours, and that monitor progress by establishing baseline conditions and trends.

Box 1. Key dimensions of sustainable development - summary of interactions



OECD work on sustainable development

5. The OECD has a specific programme on sustainable development since 1998 following a recommendation by the High-Level Advisory Group on the Environment to the OECD Secretary General and subsequent mandates from OECD Ministers in 1998 and 2001. Ministers recognised sustainable development as an overarching goal of OECD governments and the Organisation and emphasised OECD countries' special responsibility for leadership on sustainable development worldwide. The work has been designed to help Member countries address fundamental sustainable development issues by making the concept of sustainable development operational for public policies and moving beyond a sectoral approach to a more integrated approach. It also involves the development of appropriate tools to monitor progress towards sustainable development.

6. Between 1998 and 2001, OECD work concentrated on better understanding the significance of sustainable development for public policies and on examining the main policy challenges of relevance to sustainable development that OECD countries face as a group (OECD, 2001a). It further reviewed the challenges for the measurement of progress and made proposals on how to identify and develop appropriate indicators and measurement frameworks (OECD, 2001b; see also below).

7. Between 2001 and 2004, the links between the three pillars of sustainable development were further examined with emphasis on policy reform and implementation and on the analytical and scientific understanding in the area of sustainable development. The work focused on:

- indicators that measure progress across all three dimensions of sustainable development, including decoupling indicators (OECD, 2002a), and their use in peer reviews (OECD 2004c);

- obstacles to reducing environmentally harmful subsidies and to the further use of environmentally related taxes;
- social aspects of sustainable development; and
- economic, environmental and social policy coherence and integration.

It was complemented with further exchange of experience on measurement frameworks (OECD, 2004a), and on key indicators for measuring national progress (OECD, 2004d).

8. In 2005 and 2006, the OECD will continue to provide a forum for substantive policy dialogue on sustainable development and related cross-cutting issues, among which sustainable resource use, including the development of related measurement tools including material flow accounting, and decoupling and resource productivity indicators (OECD 2004b).

2. Measuring sustainable development

The measurement challenge

9. The concept of SD poses a significant challenge for measurement. Its agenda is a broad one, covering virtually all aspects of national life and government policy (OECD, 2001b). The demands for SD information are multiple, change over time and originate from policy and decision makers, as well as from the research community and from other users. Statistics and indicators are needed to support decision making both in the short term and in the longer term, as well as in-depth analytical work. There is a need to keep a balance between these short and longer term information needs, and related efforts and investments to improve information quality. The quality and credibility of SD statistics will be judged with respect to their capacity to respond to these demands.

10. This requires the provision of simple measures that inform about major trends and issues as well as more detailed measures to support additional in-depth analysis, giving attention to both the “supply side” (how statistics and related indicators can best be constructed) and the “demand side” (how indicators can be interpreted and used). Depending on the level of ambition pursued, it requires using a variety of tools and frameworks, building on their respective strengths for given purposes and on the synergies that can be gained from their combined use.

11. Sustainable development indicators for example can be seen as a juxtaposition of indicators or sets of indicators that are relevant to monitor particular policy concerns and targeted at particular audiences. A more ambitious task is to further combine and integrate these indicator sets in a way that is useful for practical policies and to ensure the availability of high quality statistics that underlie these indicators. When applied in an international context, this requires not only a good understanding of how different driving forces and policies interact, and the selection of appropriate frameworks to reflect these interactions, but also a good understanding of member countries’ political priorities, and of their economic, social and environmental contexts.

The role of frameworks

12. Frameworks are important to structure work on indicators and on underlying statistics, and to communicate results to information users. They can also be used to promote greater convergence of individual initiatives by providing a coherent framework that countries can easily implement and further adapt to their own needs. Ideally, frameworks used for measuring SD should:

- integrate the three dimensions of SD;
- have sound conceptual foundations;
- capture key information needed to calculate selected indicators; and
- help to clarify the relationships between different indicators and between indicators and policies (OECD, 2001b).

13. Looking at national and international experience so far, one can see that that a wide variety of activities are carried out and a range of different approaches and frameworks are used to structure the development of SD indicators and to improve the quality and availability of underlying data sets. Depending on the purpose to be served and the topics to be covered, these approaches are of different values and can be applied separately or in combination as complementary and mutually supporting tools (OECD, 2004a). One can generally distinguish two broad categories of frameworks that are used:

- First, conceptual frameworks that reflect the integrated nature of sustainable development, while organising the core indicators in a way useful to decision-makers and the public and encouraging the use of combined sets of SD indicators in the overall policy debate.

Frameworks that have proven useful are frameworks based on the OECD “pressure-state-response” (PSR) model and its variants such as the driving force pressure state impact response (DPSIR) model (OECD 2000, 2003). When applied to SD, these frameworks are often used in combination with the three pillar approach and/or the capital approach and with a list of themes reflecting specific concerns or policy questions. Such frameworks are often labelled as “analytical or policy frameworks”. They are generally very pragmatic and flexible, and closely linked to policy demands. Their main values lie (i) within their capacity to help users see different information parts as interconnected and to help communicating the indicators in a simple and understandable way; and (ii) within their capacity to provide common grounds while permitting their adaptation to specific national or specific policy contexts.

Such frameworks are however not designed (and not well suited) for being used as statistical frameworks, and this limitation has to be clearly understood and recognised when debating about the usefulness of different frameworks and measurement tools.

- Second, statistical frameworks that help to ensure that the statistical basis is of sufficient quality and sufficiently coherent to allow basic data sets covering different aspects to be linked together. They can thus help to move from a juxtaposition of individual indicators to a more integrated approach, and provide a consistent framework for filling data gaps and making estimates. They are particularly useful for continued, systematic and longer term efforts to improve the availability and quality of basic sets from which the indicators can be derived and that can be used to support further in-depth analysis.

Frameworks that have proven useful are frameworks based on the on accounting approaches, such as those promoted through the SEEA 2003 (UN et al, 2003) and through efforts to build social accounting matrixes. Such frameworks are generally closer to the supply side (data production side). Accounting frameworks have proven useful to structure economic statistics and derive economic indicators; they have further the potential to link monetary and physical data, to trace basic stock-flow relationships of natural resources and to serve as a basis for constructing indicators of sustainability such as the intensity of natural resource use and genuine savings.

Another area where accounting frameworks have something to offer, is the development and measurement of decoupling indicators¹.

3. Achievements since 1992

14. Since 1992, the number of international and national initiatives on sustainable development indicators has been expanding, stimulated by the work of the UN Commission for Sustainable development. Most of these initiatives were driven by demands from environmental decision makers and stakeholders, with the result that sustainable development has long been considered as an environmental issue. Environmental indicators, complemented with selected economic indicators, have generally provided the first basis for sustainable development indicators but social aspects have received increasing attention.

15. Today many countries have elaborated core sets of SD indicators and/or small sets with a reduced number of indicators that provide key signals to policy-makers and the general public (commonly referred to as headline indicators). In many cases, these initiatives have been linked to the elaboration of national SD strategies and action plans and have benefited from iterative production processes, involving many stakeholders. Important initiatives have been also launched by the European Union both at political and at statistical level.

16. In a few cases national SD strategies have been accompanied with the setting of quantitative policy targets. This has contributed to the refinement of earlier indicator sets, that were derived from sets developed independently from each other and whose original purpose has not been the measurement of sustainable development progress. A number of efforts have concentrated on further analysing the economy-environment interactions through indicators reflecting pollution intensities and resource efficiencies and the level of the decoupling between environmental pressures and economic growth. More recently, efforts are being made to explore the interactions between environmental issues and human health and to develop related indicators.

17. Progress has also been made with the elaboration of accounting frameworks to produce integrated information sets. An important example here is the United Nations' System of Integrated Environmental and Economic Accounting (SEEA) that was revised jointly by several international organisations under the lead of the London Group, including the OECD, and released in 2003 (UN et al, 2003). Examples of specific areas in which promising developments are taking place include: natural resource asset and flow accounts (e.g. water, land, forest, energy) that are used to derive indicators on the intensity of use of natural resources, reflecting the sustainability of the resource use; material flow accounts, that are being used for deriving indicators on the resource efficiency of economies; environmental satellite accounts that are used to derive data and indicators on environmental protection expenditure; and input-output and NAMEA-type approaches that are progressing in particular in Europe, but also in other OECD countries.

18. As far as other accounting tools are concerned, especially Social Accounting Matrixes, the only supranational initiative was undertaken by Eurostat and the European Statistical System. Unfortunately, due to budget constraints and other priorities, this work was discontinued and thus did not had the opportunity to strongly influence the development of integrated accounting frameworks for SD.

19. At the same time, institutional arrangements for addressing SD issues in countries have evolved. Statistical agencies have become increasingly interested and involved in the development of statistics and frameworks to support the measurement of sustainable development.

¹ While macro-level decoupling indicators were relatively easy to calculate, breaking the indicators down at sectoral level to highlight underlying drivers and structural change has proven much more difficult due to data gaps and a general lack of coherence in the definitions and classifications used.

The OECD contribution

20. Work within the OECD has been concentrating on an approach for statistically monitoring SD, with the aim to develop indicators whose quality is defensible on both conceptual and practical grounds and whose information content, and thus potential use in policy making, justifies the development. It takes advantage of the experience of OECD and its member countries in developing and using indicators in the economic, social and environmental fields, and of national and international initiatives on sustainable development indicators. The work encompasses different levels and tools, among which:

- Several sets of indicators responding to specific policy questions.

Among these is a set building on the capital approach and on the three pillars of SD, proposing the development of indicators that cover both the “outcomes” of the development process, and the inputs i.e. the “resources” (or assets) that support it, with various degrees of sectoral and spatial detail. Resource indicators, may be used to describe the accumulation and depletion of capital (produced, natural, and social assets). These indicators provide information on how current patterns and activities are impacting on future opportunities. Outcome indicators, in the economic, environmental and social fields, may be used to characterise the direction and quality of the development that is being achieved (OECD, 2001b).

This is complemented with existing sets focusing on individual aspects of sustainable development, with indicators monitoring the decoupling of environmental pressure from economic growth (OECD, 2002a), and with indicators monitoring material flows and resource productivity. Most of these indicators sets follow the core set approach (Box 2) and draw on many data sources, including information from accounting work. The OECD experience indeed suggests that practical progress in responding to short and medium term demands can best be achieved through a process focusing on a set of core indicators. This also responds to the interest by member countries in a reduced number of indicators selected from existing larger sets.

It has to be noted that core indicator sets are not designed to provide a full picture of economic-social-environmental relationship, but rather to capture key trends and draw attention to selected issues that require further analyses. They therefore need to build on broader sets of information that can usefully support this further analysis.

- The use of these indicators in policy analysis and country peer reviews. This has been done (i) through environmental performance reviews with a focus on indicators describing economy-environment relationships and decoupling indicators structured according to the PSR model, and (ii) through a three-year application in economic surveys where indicators were structured according to a menu of issues (OECD 2004c). This use in policy analysis helps to gain practical feedback about the indicators' relevance in general and for a given country in particular.
- The review and further development of frameworks and statistics that could best support the measurement of sustainable development and the calculation of indicators. Emphasis is given to the further development of accounting approaches and the regular exchange of experience in this field (OECD, 2004a), and the development of common approaches to monitor material flows and resource productivity (OECD, 2004b). A proposal has also been made to promote the establishment of national balance sheets that reflect national wealth, including man-made, natural, human and social capital (OECD, 2001b).

Box 2. Towards operational sets of sustainable development indicators - The core set approach

Moving from a juxtaposition of individual indicator sets to an operational set of sustainable development indicators can be achieved:

Through structuring the indicators and/or indicator sets in appropriate conceptual frameworks covering all relevant dimensions of sustainable development, and within which the relationships of different policy goals, the links between indicators and goals, and the interactions between different indicators are made apparent.

Through the careful selection of core indicators that provide key signals to high-level policy makers and to the general public, and whose combined use helps to raise the profile of sustainable development issues.

Through the aggregation of selected indicators into sustainable development indices. Aggregated measures are in general considered with caution and lack international consensus about the choice of the component indicators and their relative importance within an overall index (OECD, 2002b).

Selecting a set of core indicators has both benefits and limits. On the one hand, by presenting indicators from various disciplines together, it allows key aspects of sustainable development to be communicated in a simple way and thus to raise the profile of sustainable development issues in the public debate. On the other hand, it is recognised that core indicators are not designed to provide a full picture of economic-social-environmental relationship, but rather to capture key trends and draw attention to selected issues that require further analyses. These limits need to be taken into account when using such indicators.

The core set approach has the benefit of using indicators that are common to different countries or different sub-national units, that respond to different uses, and that can be meaningfully compared across countries or sub-national units. It further has the benefit of being flexible enough to be adapted to special circumstances. The core set approach has been used by many countries and international organisations, including the OECD itself, the UN, the European Commission, etc. (see also OECD, 2002).

Applying the core set approach to sustainable development indicators requires:

A balanced coverage of the three dimensions of sustainable development (economic, social, environmental). Monitoring progress towards sustainable development requires indicators that point to how well policies in the economic, environmental and social fields are performing in relation to this overall goal. Particular attention should be given to indicators that are of significance for at least two of the three dimensions.

The identification of key issues for which indicators are needed, i.e. those that are of common relevance to sustainable development progress in OECD countries. Particular attention should be given to a medium- and long-term view of developments in the various fields.

The careful selection of indicators that best reflect major trends related to these issues. These indicators can be selected from existing sets and complemented with new indicators to fill remaining gaps. As indicators can serve different purposes and uses, the number of potentially useful indicators is fairly large. It is therefore necessary to agree upon the criteria that should guide and validate their choice. In the environmental field the OECD applies the following criteria: policy relevance, analytical soundness, and measurability. These criteria can equally be applied to sustainable development indicators with a few minor adjustments.

The use of a framework that reflects the integrated nature of sustainable development while organising core indicators in a way useful to decision-makers and the public.

The use of frameworks that reflect the integrated nature of sustainable development and can be used to structure underlying statistics.

Source: based on OECD, 2000 and OECD, 2003

4. Outlook for further developments

21. Looking back at achievements and lessons learned is it quite clear that, while most of the initiatives taken so far show some commonalities in the measurement approaches adopted, there is great variability across countries in the completeness of the indicator sets and measurement tools developed, the choice of the individual indicators included in the core sets, their influence on policy debates, the level of integration of different information sources, the conceptual foundations for the statistical measurement and the effectiveness of the underlying production processes. This partially reflects the diversity of national approaches and policies to sustainable development, due to the broad nature of the concept of sustainable development. While there is a general consensus among countries about what the “common” policy challenges and questions are, the way these questions are addressed and the relative level of importance given to them may differ significantly across countries. This highlights the importance of using common

approaches that can easily be adapted to the specific situation of a given country or to specific policy questions.

22. Little progress has been made in effectively supporting the work on indicators with systematic and well structured statistical efforts to improve the measurability and the quality of underlying data sets. This has not only a bearing on the linkages between indicators and their level of integration, but it also hampers the analysis of underlying drivers and structural changes. Experience shows indeed that the complementary role of different statistical tools and frameworks and of derived indicators is often not sufficiently recognised and understood. Debates about the usefulness of accounting framework for example are often heavily supply oriented and neglect the characteristics of the actual demands for SD information. As a result, efforts concerning basic statistics and the development of accounting tools are often undertaken in isolation with insufficient connections to the indicators initiatives. Experience also shows that in a context of stable or declining funding, it is not easy to allocate resources to activities that require longer term developments and whose importance is not recognised as a priority.

23. Gaps remain in important areas, especially those related to the social aspects of SD and their interaction with environmental and economic issues, but also as regards indicators measuring externalities, and describing societal responses including economic and fiscal instruments, and indicators that take into account cross-boarder effects of economic, social and environmental phenomena and policies (see <http://www.oecd.org/dataoecd/59/55/34366513.pdf>). This section summarises some of the major areas in which further progress is desirable and gives a few hints about the best way to address these issues. It builds on the body of OECD and other experiences and on the complementarities and the synergies that exist among different tools and frameworks.

Some key areas for further progress

24. Among the key areas for progress is the further examination and development of approaches that help linking and combining environmental, social and economic indicators in existing SD core sets, and those that can help in going beyond the indicators approach. This can be achieved by building both:

- i) on a common conceptual framework that organises and communicates core indicators in a simple and understandable way and links them to policy questions;
- ii) on appropriate and coherent statistical frameworks, including accounting tools, that organise underlying data sets by integrating environmental, social and economic statistics and that structure data quality efforts.

25. There might also be room for further work on already existing international sets of sustainable development indicators, including the EU set or the proposed OECD set. The purpose would be to draw upon recent experiences and feedback from policy application, so as to ensure continued harmonisation and coherence, further refine the indicators and fill remaining gaps in their coverage (in particular as regards decoupling indicators and resource productivity indicators, social aspects, cross-boarder effects, etc.).

A coherent and balanced measurement system

26. Putting in place a coherent measurement system requires a clear understanding of the characteristics and functions of the different tools, including of their advantages and drawbacks for given purposes. It also implies short and longer term efforts, a strategic view and planning of the measurement work, and an effective co-operation between and among data providers (statistical offices, other national and sub-national data services) and data users (policy makers, policy analysts, etc.).

27. Any medium to long term development needs to be carefully planned, including the delivery of intermediate outputs to respond to current and short term demands from policy makers and the public, and to be granted appropriate funding. This is crucial to keep pace with changing demands, while maintaining continuity and regularity in the supply of core statistics. It is particularly important today where many countries cope with expanding demands for high quality information and stable or declining funding for a number of statistical and other related activities.

28. Institutional arrangements play an important role in promoting statistical work. They can for example influence the consensus on the knowledge base to be developed through statistical tools, the division of labour among public bodies involved in statistical activities, and the level of funding for statistical activities. In this respect, the early involvement of both official statisticians and other data providers and policy makers and analysts in measurement issues is essential to ensure a good demand-supply relationship and the provision of the right information for the right purpose and with the right quality.

A greater role for accounting tools?

29. Implementing accounting is typically part of a major systematic and structural effort to improve certain data sets in the longer term², in particular as regards the economic dimension of environmental management and the linkages between economic, environmental and, to a certain extent also, social data sets. Hence, greater use of accounting frameworks is seen as desirable, but it may also entail a risk of making the data production system more complex, more rigid (loosing the flexibility needed to progressively adjust and refine the resulting indicators) and leading to resource intensive updating processes.

30. Further work on accounting frameworks and related accounts should therefore focus on the most promising uses taking into account policy demands for indicators, as well as the costs and benefits of accounting systems compared to those of other statistical systems and measurement tools that may be more appropriate for improving information in other areas, including the scientific quality of the data, and for addressing issues of uncertainty. In particular, the approach followed so far has been based on the joint use of “sectoral” frameworks developed for each of the three domains (input-output tables, environmental accounts, social accounting matrices). It is quite clear that, by simple juxtaposition of detailed accounting schemes, the resulting framework can appear very broad and complicated, and its implementation can be considered a huge and very costly task. What could be extremely useful would be the development of a simplified accounting framework for SD based on a careful integration (and not simply juxtaposition) of recently developed or new proposals.

31. Environmental accounting is certainly an area in which further work could be promising, taking advantage of the SEEA 2003 and of ongoing work on material flow accounts. In the short and medium term, efforts should focus on consolidating and making greater use of already existing accounting activities and resulting data (e.g. natural resource accounts, environmental expenditure accounts, material flow accounts, as well as selected NAMEA-type accounts and selected social accounting activities). This also implies improved publication and dissemination of accounting results, further international harmonisation of key accounting activities, the establishment of closer links between accounting work and the development of indicators, as well as increased capacity building and practical guidance for implementation.

² 30 years of experience in OECD countries have shown indeed that implementing environmental accounting is a long and resource intensive task, and overall progress since the 1970s has been slow despite growing interest. In some countries, among which the pioneers in the field of natural resource accounting, work has been narrowed down with a focus on selected core accounts and often irregular updates.

32. Taking a broader and longer term perspective, the further harmonisation of classifications and definitions and the establishment and further development of national balance sheets could provide useful tools to cover different aspects of sustainable development and its capital basis in a more consistent way (OECD, 2001b, 2004a).

International aspects

33. As already underlined, SD is a complex theme, with interwoven national and supranational policy dimensions and related information demands. One should therefore keep in mind the important role of:

- multilateral agreements or high level national and international policy requests (e.g. EU or G8) that have often been major drivers in measurement efforts (e.g. in the environmental field);
- international co-operation and co-ordination that foster the exchange of experience and information, and encourage the adoption of common approaches and frameworks that enable cross-country comparisons and policy analysis at international level.

34. Experience shows indeed a strong interdependence between progress at national level and progress at international level. The OECD itself has often played catalytic role with respect to national efforts by stimulating further national initiatives through: sharing experience among Member countries; developing common approaches and frameworks, systematic use of the indicators in OECD analysis of national policies; and regular publication of the indicators. Similar experiences are made at European Union and United Nations levels.

35. The recent involvement of national statistical offices in the measurement of SD is making the international statistical system more and more aware of the challenges ahead and of the need of avoiding duplications of effort and fostering international co-operation and co-ordination. In this context, past and current UN, OECD, Eurostat and other international work on SD measurement issues, both for indicators and frameworks, as well as the recent decision of the UN Statistical Commission to create a Committee on environmental accounting are important steps forward, but this alone may not suffice to make this theme a statistical priority, at least for many countries. International organisations could play an even greater role, not only by fostering the dialogue between national and international statisticians and policy makers, but also by improving the capacity of the international community to address global issues, such as sustainable development, building on reliable and comparable statistical information.

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