Department of Economic and Social Affairs
Division for Sustainable Development

REPORT

Expert Group Meeting on
Indicators of Sustainable Development

New York, USA

13 – 15 December 2005

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I. INTRODUCTION

A. Background

1. Indicators of sustainable development are important tools to increase focus on sustainable development and to assist decision-makers at all levels to adopt sound national sustainable development policies. The 1992 Earth Summit recognized the importance and called upon countries and the international community to develop such indicators.

2. The Division for Sustainable Development (DSD) within the United Nations Department of Economic and Social Affairs (DESA) implemented its Programme of Work on Indicators on Sustainable Development, mandated by the Commission on Sustainable Development (CSD), between 1995 and 2001. The work programme culminated in a set of 58 indicators, based on a Theme/Sub-theme framework, and presented in the publication "Indicators of Sustainable Development: Guidelines and Methodologies". The set was adopted by the CSD in 2001 after extensive consultations and national testing programmes. The main role of the CSD-ISD is to serve as reference for countries to develop national indicators for sustainable development. The World Summit on Sustainable Development in 2002 and subsequent sessions of the CSD encouraged further work on indicators for sustainable development by countries in line with national conditions and priorities and invited the international community to support efforts of developing countries in this regard.

3. In 2005, the DSD decided to review and update its current set of indicators. The review is timely, because countries and organizations have increased their knowledge of and experiences with indicators of sustainable development since 2001 and because the world sees an increasing emphasis on measuring development progress, as evidenced for example by the Millennium Development Goals.

4. As part of the review process, DSD decided to convene this global Expert Group Meeting. The Meeting was held in New York from 13 – 15 December 2005. Ms. Mary Pat Silveira, Chief, National Information, Monitoring and Outreach Branch DESA/DSD, chaired the Meeting.

B. Objectives

5. The objectives

   a. To review and update the current list of Indicators of Sustainable Development of the Commission of Sustainable Development

   b. To consider future areas of work on indicators.

C. Participants

6. A list of participants is attached as Annex 1 to the report.

II. SUMMARY OF DISCUSSIONS

7. The Expert Group Meeting adopted the provisional agenda, attached as Annex 2.

A . Opening session

8. The Chair welcomed participants. She briefly summarized the previous work of DSD on indicators of sustainable development. The CSD indicators of sustainable development (CSD-ISD) made a major transition, from a list of 134 indicators embedded in a Driving force – State – Response (DSR) framework to the current list of 59 indicators embedded in a theme/sub-theme framework. The consultative process and the very active participation of both international agencies and countries are two outstanding features of the work programme. For this meeting, DSD undertook an interim assessment done on proposals for revising the CSD-ISD submitted by international agencies and on the relation of the CSD-ISD to MDG indicators. As all proposals addressed important issues, they should all be discussed further, together with new proposals emanating from the Meeting. Harmonization with the MDG indicators would be fruitful where possible, and differences in definitions should be eliminated. However, due to the different purposes and the broader thematic and geographical coverage of the CSD-ISD, the two sets are expected to remain distinct from each other after completion of their revision processes. In order to remain manageable and relevant, the revised set of CSD-ISD should not increase in size. The selection criteria for the current set are still appropriate: indicators should be primarily national in scope, relevant, understandable, within the capabilities of national governments, conceptually sound, limited in number, broad in coverage of Agenda 21 and all aspects of sustainable development, representative of an international consensus to the extent possible, and dependent on cost effective data of known quality.

9. Participants from countries and regional organizations reported on current progress on the development of sustainable development indicators and strategies. Co-incidentally, four important publications (EUROSTAT's "Measuring progress towards a more sustainable Europe", the United Kingdom's "Regional versions of the UK Government's indicators of sustainable development", UNEP/MAPs "A Sustainable Future for the Mediterranean. The Blue Plan's Environment and Development Outlook" and the World Bank's ""Where is the Wealth of Nations:Measuring Capital for the 21st Century") were released just before and during the time of the Meeting.

B. Review of Indicators

General comments

10. A revised CSD-ISD should address the relationships among themes, sub-themes and indicators more explicitly. One way to move in this direction is to cease categorizing the

indicators along the lines of the four "pillars" (social, economic, environmental and institutional) in order to emphasize the multi-dimensional nature of sustainable development. The acceptance of the indicators will depend on their importance for national use, particularly by decision-makers both for policy-making and for policy implementation. The number of core indicators should remain relatively small, but additional complimentary or secondary indicators could be added for those countries that would like to look into an issue in more detail. The revised structure, especially the list of additional indicators, would need some additional look to ensure consistency.

11. While policy-makers and planners are in most cases the main users of sustainable development indicators, they are not the only users. Many other stakeholders have an interest in using ISD, and the general public has an interest in being kept informed of the results of indicator measurements and analysis.

12. The meeting reviewed each current CSD-ISD indicator, each MDG indicator, and each of the proposals made prior and during the meeting to revise the CSD-ISD. The MDG indicators were included in the review in order to avoid duplication of indicator processes and explore synergies between the two sets. The meeting conducted the review on the basis of the summary table contained in the conference paper UNDSD/EGM/ISD/2005/CRP.1.[1] The discussions led to a three-fold classification of indicators: core; additional, or secondary (that is, indicators that may be of interest for additional detail or insight); and tertiary (that is, those which appear to be compelling but which need further development). On this basis, the meeting agreed on 54 core indicators, 33 additional indicators and 12 indicators to be developed. Out of the 58 current (reference) CSD indicators, 31 were retained as core indicators unchanged or with minor revisions. A further six were kept as core indicators with substantial revision, whereas eight were moved from "core" to "additional" indicators. Nine indicators were replaced with new, more appropriate indicators and four were deleted. This interim list will be reviewed further, not least because a number of issues are still not covered by concrete indicators. Moreover, the list of themes and sub-themes may also need further refinement. The different purposes of sustainable development indicators and the MDG indicators are the main reason why full harmonization of the two sets is unfeasible.

13. During the meeting and the review of the draft report, participants raised some general points for reflection in future meetings on the CSD-ISD. These include selection criteria for non-core indicators, the time-horizon of sustainable development, and the relationship between reversible economic and environment setbacks and sustainable development.

14. In the following, the outcome of the review is presented on a theme-by-theme basis. For each theme, a table summarizes the interim revised CSD-ISD as agreed during the meeting.

[1] The table of all CSD and MDG indicators, as well as other indicators proposed prior to the meeting, is contained in Annex 3.

Equity

Table II-1: Interim revised CSD-ISD within the equity theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Poverty	Percent of Population Living Below National Poverty Line	Proportion of population below $1 (1993 PPP) per day	
	Share in national income by quintile (Alternative Ratio of share in national income of highest to lowest quintile)		
	Employment rate, disaggregated by sex		
Poverty	Employment Status, by sex (Share of unpaid family workers in total employed persons)		
Gender Equality	Ratio of Average Female Wage to Male Wage		

15. The reference CSD ISD included three poverty indicators: (1) percent of population living below the poverty line; (2) Gini index of income inequality; and (3) the unemployment rate. In addition, there were five separate MDG indicators relating to poverty which were reviewed. On gender equality, there are one CSD-ISD indicator (Ratio of Average Female Wage to Male Wage) and four MDG indicators.

16. In reviewing the poverty indicators, it was agreed that retaining an indicator that reflects national poverty lines is important, since the meaning and significance of poverty varies by country. The MDG indicator (Proportion of Population below 1 $ per day in 1993 PPP) could be used as a secondary indicator for comparison purposes, if desired. The more technical Gini index was replaced with an indicator based on income distribution by quintile. Due to difficulties in obtaining consumption data, income based indicators are preferable.

17. Despite its policy relevance, the unemployment rate was not considered sufficient in addressing the need for decent and productive employment. The employment rate (the ratio of employed persons to the total number of persons in working age, usually 15-64 years) is preferred, even though it does not address types of employment. For that purpose, indicators on labor productivity and on employment status were proposed. Employment status could be measured by the share of unpaid family workers in total employment, with a high share indicating a lack of decent employment opportunities. The discussion also pointed at the recent increase in policy relevance of labor productivity.

18. The reference CSD-ISD indicator on gender equality should be retained. Furthermore, all employment and education indicators, among others, should be reported for both sexes separately.

Health

Table II-2: Interim revised CSD-ISD within the health theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Nutritional Status	Nutritional Status of Children (Percentage of underweight and obese (or overweight) children)		
Mortality	Mortality Rate Under 5 Year Old		
	Life expectancy at Birth	Healthy life years	
Sanitation	Proportion of population with access to improved sanitation, urban and rural	Breakdown by OECD primary, secondary, and tertiary wastewater treatment category, and/or by urban and rural	
Drinking Water	Population with Access to Safe Drinking Water		
Health Care Delivery	Percent of Population with Access to Primary Health Care Facilities		
	Immunization Against Infectious Childhood Diseases		
	Contraceptive Prevalence Rate		
	Total fertility rate		
Sub-theme to be defined (Prevalence of illnesses and diseases)		Tobacco use indicator (E.g., smoking prevalence)	
		Prevalence of mental health problems (E.g., suicide rates as proxy)	

19. The current CSD list contains eight health indicators in five sub-themes: (1) nutritional status of children; (2) mortality rate under 5 years old; (3) life expectancy at birth; (4) percent of population with adequate sewage disposal facilities; (5) population with access to safe drinking water; (6) percent of population with access to primary health care facilities; (7) immunization against infectious childhood diseases; and (8) contraceptive prevalence rate. There are in total 19 MDG health-related indicators. ‘

20. The current three indicators on nutritional status and mortality are still very relevant. It was suggested that nutritional status should cover not only underweight, but also the increasing problem of child obesity. Participants proposed the EU indicator on 'Healthy life years' as alternative or additional indicator to life expectancy, at least for countries that would be able to produce replicable data on it.

21. By adopting the proposals of WHO, the meeting fully harmonized the two indicators on sanitation and drinking water with the corresponding MDG indicators. Besides eliminating small differences in the definitions, the harmonization includes a name change for the sanitation indicator. Participants suggested adding the differentiation of waste water treatment, for urban areas, according to the three categories defined by OECD (primary, secondary tertiary treatment).

22. The current indicator on primary health care access is very relevant, as is the indicator on immunization against childhood diseases. The related MDG indicator on immunization against measles is a useful proxy for many countries. Contraceptive prevalence rate continues to be important, but participants expressed reservations against an additional indicator on unmet needs of family planning. Most participants welcomed the proposal to include total fertility rate into the CSD-ISD list, even though some cautioned that the indicator could be highly correlated to population growth and, therefore, be redundant. The development of a health –specific index was suggested for future work. Other possible new areas include indicators related to chronic diseases (e.g., tobacco use) and mental health (e.g., suicide rates). The proposed indicator on solid fuel consumption was discussed in the context of energy indicators.

Education

Table II-3: Interim revised CSD-ISD within the education theme

Sub-theme	***Core Indicators***	***Additional/ Secondary Indicators***	***To be developed / Tertiary Indicator***
Education level	Gross intake into last year of primary education, by sex		
		Net enrolment rate in primary education	
	Adult Education Attainment Level (Secondary and/or tertiary), by sex		
		Life long learning (Proportion of working age population receiving learning or training)	
Literacy	Adult Literacy Rate, by sex		

23. The reference CSD ISD set included three education indicators: (1) children reaching grade 5 of primary education; (2) adult secondary education attainment level; and (3)

adult literacy rate. There are also three MDG indicators on education. The meeting endorsed the proposal to replace the measure of the survival rate of primary education with a measure of the completion rate. Such an indicator, defined as gross intake rate into last year of primary education, is able also to address the issue of access to primary education. Net enrolment rate in primary education may be a useful supplementary indicator. There are problems in getting accurate and timely data on education attainment and, especially, literacy. However, new methodologies for directly measuring literacy skills will be used in a large number of countries over the coming years. Tertiary education may be more important than secondary education in many countries. For some countries, life-long learning is another important issue. All education indicators should be disaggregated by sex. Reference to indigenous minorities could be made in the methodology sheets.

Housing

Table II-4: Interim revised CSD-ISD within the housing theme

Sub-theme	***Core Indicators***	***Additional/ Secondary Indicators***	***To be developed / Tertiary Indicator***
Living Conditions	Proportion of population living in slums		Indicator on quality of housing indicator
Access to energy	Share of households without access to electricity or commercial energy		

24. Currently, there exists one CSD indicator on living conditions (floor area per person) and one corresponding MDG indicator. The CSD reference indicator on housing was found to be inadequate, and data are not available for the related MDG indicator. The proportion of households living in unhealthy, or slum-like, conditions is a suitable indicator in many countries. Ongoing work on indicators of housing adequacy could lead to further indicators. However, the relationship of such indicators to sustainable development should be clarified.

25. Access to energy is an important indicator in the context of a multitude of development issues (e.g.,. education, gender, health) including housing and has particular relevance to poverty issues. The share of households without access to electricity or commercial energy is a suitable indicator for most developing countries, even though access indicators in general often prove difficult to measure.

Security

Table II-5: Interim revised CSD-ISD within the security theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Crime			Number of recorded serious crimes per 100,000 population (Serious crimes to be defined)
			Indicator on Corruption

26. The current CSD-ISD set included one indicator on security: number of recorded crimes per 100,000 population. This indicator is subject to serious misinterpretation, but restricting it to homicides is too limiting. An indicator on serious crime, which should also include robbery, assault and other crimes, would be a better alternative. Further work on governance indicators remains a high priority. This work should include the development of an indicator on corruption.

Population

Table II-6: Interim revised CSD-ISD within the population theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Population Change	Population Growth Rate, rural and urban		
	Dependency Ratio		

27. The reference CSD-ISD list included two indicators on population change: (1) population of urban formal and informal settlements; and (2) population growth rate. Severe data problems regarding informal settlements preclude useful application of such indicators. However, population changes can and should be reported separately for rural and urban areas. The correlation between population growth and fertility rates was discussed. A dependency-rate indicator, especially old-age dependency ratio, is useful for monitoring many economic implications of demographic change.

Atmosphere

Table II-7: Interim revised CSD-ISD within the atmosphere theme

Sub-theme	***Core Indicators***	***Additional/ Secondary Indicators***	***To be developed / Tertiary Indicator***
Climate Change	Emissions of Greenhouse Gases	Emission by sector, according to internationally standardized sector classification	
		Amount of carbon sequestered by forests.	
Ozone Layer Depletion	Consumption of Ozone Depleting Substances		
Air Quality	Ambient Concentration of Air Pollutants in Urban Areas		
			Indicator on Persistent Organic Pollutants (POPs)

28. In the CSD reference set of ISD, three CSD indicators covered different aspects of the state of the atmosphere: (1) emissions of greenhouse gases; (2) consumption of ozone depleting substances; and (3) ambient concentration of air pollutants in urban areas. The MDG indicator on climate change considers only carbon dioxide. However, the proposal discussed by the MDG subgroup on environment to include emissions of all greenhouse gases in the MDG indicator would lead to harmonization with the current CSD indicator. Greenhouse gas emissions should be broken down by sector, using, as far as possible, the internationally agreed standard classifications. A useful additional indicator could be the amount of carbon sequestered by forests, for which a methodology has been developed by the IPCC. Future indicator work in this area might also try to measure the international market for carbon emissions.

29. Ozone depleting substances should remain on the CSD list. Despite remarkable progress in the phasing-out of CFCs, the persistent use of non-CFC and illegal CFC production continue to be an important environmental problem. Full harmonization with the corresponding MDG indicator, which covers CFCs only, is not appropriate to address the long-term global challenges in this area.

30. It is difficult to obtain data on air pollution that is comparable over time and across countries, and the cost of measuring air pollution is high. Nonetheless, it is important that the indicator to measure ambient concentration of air pollutants remains. Fine particles, ozone and nitrogen are the most important pollutants in some countries. Further work should be done to identify an indicator for persistant organic pollutants, which is an issue of concern for both health and environment. Another area for future investigation is measuring expenditures on adaptation to climate change.

Land

Table II-8: Interim revised CSD-ISD within the land theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Agriculture	Arable and Permanent Crop Land Area (Part of land use indicator)		
	Land degradation		
		Use of Fertilizer	
		Use of Agricultural Pesticides	
		Organic farming as percentage of total farming	
Forests	Forest Area as a Percent of Land Area (Part of land use indicator)	Forest Area as a Percent of Land Area, by type of forest.	
		Percent of forests damaged by defoliation	
		Wood Harvesting Intensity	
			Forest governance
Desertification	Land affected by desertification (Land degradation in arid, semi-arid and dry sub-humid areas)		

31. The reference CSD list included seven land indicators in three sub-themes: (1) arable and permanent crop land area; (2) use of fertilizer; (3) use of pesticides; (4) forest area as percent of land area; (5) wood harvesting intensity; (6) land affected by desertification; and (7) area of urban formal and informal settlements. The forest area indicator is also contained in the MDG indicator list. Due to problems with geographical data on informal settlements and due to the inclusion of a population based indicator on slums, the last indicator will be deleted.

32. Indicators such as crop land area and use of both fertilizers and pesticides continue to be used in part because of the availability of time series data. Other agricultural indicators currently used in national sets of sustainable development indicators include wheat yield, land erosion, salinization, soil management, and farmland bird population. In general, indicators on land use change and land degradation are more appropriate to address sustainability issues. Organic farming is an additional area of interest.

33. The reference indicator on forest coverage does not fully address the problem of deforestation. Additional information on coverage by type of forests (primary forests, modified natural forests, semi-natural forests, productive forest plantations, protective

forest plantations) would be an important improvement. Forest governance is an important issue, but forest ownership data may not be a useful proxy.

34. Land degradation, including desertification, is an important problem in many countries.

Oceans, Seas and Coasts

Table II-9: Interim revised CSD-ISD within the oceans, seas and coasts theme

Sub-theme	***Core Indicators***	***Additional/ Secondary Indicators***	***To be developed / Tertiary Indicator***
Coastal Zone	Algae Concentration in Coastal Waters		
		Percentage of total population living in coastal areas	
			Coastal pollution
Fisheries	Fish catch outside safe biological limits		
Marine environment			Coral reefs
			Marine trophic index

35. The reference CSD list included three indicators for this theme: (1) algae concentration in coastal waters; (2) percentage of total population living in coastal areas; and (3) annual catch by major species. Coastal zones and coastal areas are of concern for many countries and regions in the world, but both concepts are currently poorly defined for measurement purposes. Using altitude as a secondary criterion to define a coastal area (e.g., land area that is within 100 km, or within another nationally appropriate distance, from the coast line and less than 10 m above sea level) may be one solution. There are legal definitions for coastal zones, e.g., sovereignty over coastal waters (12 nautical miles) and exclusive economic zones (200 nautical miles), but these are not necessarily relevant to such issues as algae concentrations. Indicators are also needed for coral reefs, marine trophic indices, coastal pollution and waste disposal. For this purpose, existing indicators such as the CBD marine trophic index may have to be adapted to fit into national sets of indicators. Work by UNEP/MAP on coastal indicators will be taken into account. An indicator on depletion of fish stocks would be better than the current fish catches indicator, but country data on stocks may be problematic. A good indicator that is measurable is the fish catch outside safe biological limits, which can link national catch data to stock data defining safe limits.

Fresh water

Table II-10: Interim revised CSD-ISD within the fresh water theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Water Quantity	Annual Withdrawal of Ground and Surface as Percent of Total Renewable Water		
Water Quality	BOD in Water Bodies		
	Concentration of Faecal Coliform in Freshwater		
		Metal contamination of Fresh Water	

36. There were three fresh water indicators contained in the reference CSD list: (1) annual withdrawal of ground and surface water as a percent of total renewable water; (2) BOD in water bodies; and (3) concentration of faecal coliform in freshwater. The indicator on water quantity remains appropriate. Both existing water quality indicators remain, and a third, on metal contamination, may also be considered. At a later stage, it might be useful to substitute a water quality index, such as those used by FAO or the Mediterranean Action Programme, although methodological concerns against the use of indices persist. The work of UN Water may constitute an additional source of further information.

Biodiversity

Table II-11: Interim revised CSD-ISD within the biodiversity theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Ecosystem	Coverage of protected areas by biome and habitat		
		Area of Selected Key Ecosystems	
			Management effectiveness of protected areas
			Fragmentation of habitat
Species	Abundance of Selected Key Species		
		Status and trends of farmland and woodland birds	
		Status and trends of butterflies	
		Assessment of threatened species	

37. The reference CSD list included three biodiversity indicators: (1) protected area as a percent of total land; (2) area of selected key ecosystems; and (3) abundance of key

species. Participants agreed that the first indicator, also contained in the list of MDG indicators, does not take monitoring for types of protected areas, effectiveness of protection, and biodiversity in non-protected areas into account. The indicator on area of ecosystems is also not reliably representative of the sustainable development dimension of ecosystems. Among other things, the marine environment is not covered. In addition, in many countries, protected areas can be found primarily in biomes of low economic value. Moreover, protected areas do not indicate trends in biodiversity. In the future, indicators on effective management of protected areas should be developed. Currently, many agencies are actively involved in important work on indictors within the framework of the Convention on Biological Diversity. Once this work is completed, its results should be reflected in the CSD-ISD. In the meantime, measuring protected area by biome and habitat provides a useful indicator. Habitat fragmentation, for example measured as roads or pipelines through protected areas, could be covered by an additional indicator, even though the development of such indicator is still ongoing.

38. Among key species, measuring both farmland birds and butterflies has proven to be good indicators not only of biodiversity but also of the impact of agricultural production patterns. More detailed assessment of threatened species would be useful as a secondary indicator; species to be covered would vary from country to country.

Economic Structure

Table II-12: Interim revised CSD-ISD within the economic structure theme

Sub-theme	***Core Indicators***	***Additional/ Secondary Indicators***	***To be developed / Tertiary Indicator***
Economic performance	GDP per Capita		
		Investment Share in GDP	
	Net Savings Rate (alternative: Genuine Savings Rate)		
	Labor productivity		
		Unit labor costs	
	Inflation		
Science and Technology	R&D Expenditure as percentage of GDP		
Tourism			Tourism indicators
Trade	Current account deficit as percentage of GDP		
	Share of imports from developing countries and from LDCs		
Financial Status	Total Official Development Assistance (ODA) given or received as a percentage of GNI		
	Debt to GNI ratio		

		Net FDI inflows and outflows as percentage of GNI	
		Remittances as percentage of GNI	

39. Five indicators covered the economic structure in the reference CSD-ISD list: (1) GDP per capita; (2) investment share in GDP; (3) balance of trade in goods and services; (4) total official development assistance (ODA) given or received as percentage of GNP; and (5) debt to GNP ratio. The Meeting also reviewed the 12 MDG indicators in this theme. GDP is not a measure of "sustainability", and some pro-growth policies could be unsustainable. However GDP is one central indicator of economic development, which is a necessary condition for sustainable development. GDP should be measured in real terms. Indicators for a 'Green GDP' could be developed for inclusion in the list in the future. An indicator on savings is an important element of economic health, although there was not final agreement on which savings rate to use -- the genuine savings rate developed by the World Bank or one of the traditional macroeconomic savings indicators. Labour productivity, to be accompanied by an indicator on unit labor costs, and research and development expenditures are of universal importance. Inflation is a very important indicator for some countries, but of secondary importance for sustainable development in others. At least one tourism indicator should be included in the CSD-ISD, but no work has yet been done on defining the most appropriate tourism indicator(s) for the CSD set.

40. The proposed indicators on current account balance and on the share of imports from developing countries and LDCs cover important trade related aspects of sustainable development. ODA also remains important for many donors and recipients. The share of debt (both foreign and domestic) to GNI is suitable to address sustainability of public finances. FDI and remittances would be useful additional indicators on economic performance.

41. Research and development expenditures have severe limitations as they: do not address R&D potential, hide the source of R&D, are subject to wage fluctuations and inflation, and are not adequately reflected in many national accounting systems, especially in developing countries. Nevertheless, expenditures were seen as a better economic indicator for most countries than the share of researchers in total employment or in total labor force, as such indicator would raise further problems of defining what constitutes a researcher. Patents could be an output based research indicator, but the relevance of this as an indicator would also depend on the national patent system.

Consumption and Production Patterns

Table II-13: Interim revised CSD-ISD within the consumption and production pattern theme

Sub-theme	*Core Indicators*	*Additional/ Secondary Indicators*	*To be developed / Tertiary Indicator*
Material Consumption	Intensity of Material Use	Intensity of Material Use by sector, based on standard classification	
		Annual Material Use per Capita	
Energy Use	Annual Energy Consumption per Capita	Annual Energy Consumption by type of source (renewable, bio-fuels, fossil fuels…)	
	Intensity of Energy Use		
Waste Generation and Management	Generation of Waste	Generation of Waste by industry / sector (based on standard classification)	
	Generation of Hazardous Waste		Management of Hazardous Waste
	Management of Radioactive Waste		
	Waste Treatment and Disposal by method of treatment (recycled, incinerated, land filled)		
Transportation	Share of cars in passenger transportation		
		Road share of freight transport	
		Fuel use by distance of passenger transportation	

42. The reference CSD list included nine indicators in this theme: (1) intensity of material use; (2)annual energy consumption per capita; (3)share of consumption of renewable energy sources; (4) intensity of energy use; (5) generation of industrial and municipal solid waste; (6) generation of hazardous waste; (7) management of radioactive waste; (8) waste recycling and reuse; and (9) distance traveled per capita by mode of transport. There are also two energy-related MDG indicators in this area. In addition to the current material intensity indicator, total or per-capita material consumption should be covered. However, material consumption indicators may be biased towards the construction sector as they are measured in weight. Energy intensity and per capita use are suitable core indicators. The unit of measurement of the indicator on energy intensity will be adjusted to be consistent with the corresponding MDG indicator. A breakdown of the indicator on energy consumption per capita by type of fuel would cover the issue of renewable energy sources, which by itself would be of limited importance for many developing countries.

Most participants viewed consumption-based energy indicators as more meaningful than production-based ones, so that a separate indicator on biofuel production would not be necessary. The issue of access to energy, which is covered by the MDG indicator on solid fuels, may relate more to housing and poverty than to energy production (see table II-4 above).

43. The proposed substantive revisions of the waste generation and waste treatment and disposal indicators will further increase the relevance of the waste indicators. An additional breakdown by sector could deliver further important information. The indicators on hazardous waste and on radioactive waste management should be retained. The development of a waste management indicator for hazardous waste, similar to the one on radioactive waste could be useful for future revisions. Participants also noted problems related to the lack of data on self-disposal of waste by firms and to the use of weight rather than volume units.

44. On transport, the shares of cars in total passenger transport and of road based freight in freight transport could be more meaningful than the current indicator of distance traveled per capita by transport mode. The meeting also discussed indicators on the share of collective transport, fuel consumption, and road density.

Institutional capacity

45. Neither of the existing indicators on institutional framework – national sustainable development strategies or implementation of ratified global agreements – are really measurable, and it was decided to remove both of them from the list. In addition, it may later be decided to restructure this section and integrate the remaining indicators into other themes.

Table II-14: Interim revised CSD-ISD within the institutional capacity theme

Sub-theme	***Core Indicators***	***Additional/ Secondary Indicators***	***To be developed / Tertiary Indicator***
Information Access	Internet users per 100 population		
Communication Infrastructure		Fixed Telephone lines and cellular subscribers per 100 population	
Disaster Preparedness and Response		Economic and Human Loss Due to Natural Disasters, as percentage of population and of GDP	
Vulnerability to Natural Hazards	Percentage of population living in disaster prone areas, by type of natural disaster		

No current sub-theme (Good governance)			Governance indicators

46. In the reference set, there were four institutional capacity indicators: (1) number of internet subscribers per 1000 inhabitants; (2) main telephone lines per 1000 inhabitants; (3) expenditure on R&D as a percent of GDP; and (4) economic and human loss due to natural disasters. The R&D indicator will be moved to the economic structure theme, as described above.

47. Good governance is a very important area, but universal and unambiguous indicators have been difficult to identify. Indicators used at national and regional levels include public confidence polls, e-government use, participation in elections, numbers of NGOs, numbers of social protests, newspaper circulation, numbers of local Agenda 21 initiatives, and numbers of environmental awareness programmes, among others. However, the appropriateness of many indicators critically depends on the country context.

48. The share of Internet users in total population is an improvement over the subscription rate, even though it still does not accurately reflect access to information via the internet, especially in developing countries. Mobile telephones are important, especially in developing countries. However, telephone indicators may be redundant due to their high correlation to other development indicators such as GDP per capita.

49. On natural disasters, participants learned that the recently adopted Hyogo Convention included a shift in emphasis away from human and economic losses towards risk reduction. The current indicator remains important, but is retrospective and extremely volatile, and economic losses are biased towards more developed countries. However, participants were of the view that scaling economic losses by GDP could mitigate the latter problem. The percentage of population living in high risk areas would cover different aspects of vulnerability and be less volatile and problematic. However, participants requested a distinction between sources of natural disasters (geological, weather related, etc.). They also emphasized that natural hazards do not have to become disasters and that policy choices are very important in this regard.

C. Indicators of Sustainable Development – Suitability of Frameworks

50. Mr. Thorvald Moe, Deputy Secretary General, Norwegian Ministry of Finance of Norway, in his presentation on the "The Need for an International Framework for the Construction of National Indicators for Policies to Enhance Sustainable Development", emphasized that for developing indicators of sustainable development, one should identify the main driving forces and resources needed to sustain long term economic development for future generations. These drivers were technological progress, real

capital, financial capital, environmental capital, natural capital, human capital and social (institutional) capital.

51. He regarded national wealth, now computed regularly by a number of national statistical agencies in OECD countries, as a key indicator for the development of a nation`s total capital stock. This indicator is closely related to GDP and GNI, key indicators for shorter term economic developments and policies. For practical and other reasons, including the precautionary principle, one also needs separate measures for all the six major categories of capital. In Norway, as in many other OECD countries, human capital is the main capital component, estimated at 2/3 to 3/4 of the total capital stock. Thus policies to enhance human capital are key to sustainable development, both in developed and developing countries. Measurement of human capital, however, remains unsatisfactory. For sustainable development, it is absolutely essential to avoid that key resources or capital stocks are reduced below critical or irreversible levels. This holds especially for non-renewable and semi-renewable (for example, fish stocks) natural resources. Environmental services from, e.g., biological diversity, which are important by themselves, render important functions for economic development that remain largely unknown. To ensure sustainable development in the longer term, and given the uncertainty involved, one needs to avoid an irreversible state of affairs regarding biological diversity. Permanently increasing levels of real, financial and human capital cannot substitute decreasing (unsustainably low) levels of environmental and natural capital.

52. Norway has only one long term development plan (NA 21) that is coordinated by one ministry (The Ministry of Finance) in cooperation with other ministries, notably the Ministry of Environment. The NA 21 is focused on a few key areas of high political interests, and is a long-term plan that is not a substitute for shorter- and medium term economic, environmental and social policies. Statistics Norway is asked to regularly update and critically analyze the 18 core sustainable development indicators for NA 21 policies.

53. Mr. Ivo Havinga, Chief, Economic Statistics Branch, United Nations Statistic Division, gave an overview of the System of integrated Environmental and Economic Accounting, (SEEA), and its relevance for the derivation of indicators. He pointed out the the SEEA can be used as the information base for the capital approach and in particular the derivation of the wealth of a nation. The SEEA is an information system which organizes environmental and economic information according to the concepts, classifications and definitions of the System of National Accounts (SNA). This allows for integrated analyses of the interactions between the economy and the environment as well as formulation of policies.

54. The SEEA encourages the adoption of standards and improves both economic and environment statistics by fostering consistency. A number of indicators related to the environmental and economic aspects of development can be derived from the SEEA and they have the advantage of being consistent and coherent. In addition, the underlying integrated information system allows for in-depth analyses of the processes behind

changes in the indicators thus facilitating the formulation of policies. A number of countries compile regularly environmental accounts and use the accounting framework for the derivation of indicators including sustainable development indicators.

55. Mr. Havinga pointed out that the accounting framework could be extended to include also the social sphere of development, but given the complexity of the social dimension and its interaction with the economy and the environment, past efforts to advance work in this area have not yet succeeded. Mr. Havinga also presented the newly established UN Committee of experts on Environmental-Economic Accounting (UNCEEA) whose broad objectives are (a) to mainstream environmental accounting and related statistics, (b) to elevate the SEEA to the level of standard and (c) to promote the implementation of the SEEA in countries

56. During the discussion, participants lauded the potential of the capital framework and the environmental-economic accounting framework for the derivation of sustainable development indicators. However, some cautioned against the development of new frameworks for the CSD-ISD, as this could cause confusion in the existing work in many countries that already established policy relevant frameworks. It was also noted that many countries implicitly utilize notions of capital in their sets of sustainable development indicators, even though they refrain from adopting an explicit capital framework. Many participants saw merit in data provision through the SEEA. Economic valuation of natural resources is essential, not at least because it could convince policy makers to make choices towards sustainable development. Given the conceptual and most likely persistent challenges associated with non-market valuations, a hybrid accounting approach may be needed that integrates both physical and economic accounts. Participants viewed opportunity costs and cultural values as concepts that should not be ignored for valuing activities and resources.

57. In general, participants regarded as imperative that sustainable development indicators are driven by policy. Better linkages between data systems and indicators are overdue because they could ensure the coherence of indicators, improve the effectiveness and policy relevance of monitoring systems and increase data availability. Additional efforts are needed to develop integrated data systems that that give full consideration not only to financial, real, natural and environmental but also to human and social capital. Participants also noted that accounting frameworks concentrate on the current situation, and may not be able to address future threats to sustainable development.

58. Mr. Mourad Amil from the Ministry of Environment of Morocco presented "The use of indicators of sustainable development – a step in the national strategy of sustainable development". Under the demands of development, both use of natural resources and environmental degradation have increased. Moreover, the presence of new multilateral and regional environmental and trade agreements has resulted in pressures to produce high quality goods at low cost with a reduced negative impact on the environment. These two challenges created the need to develop a global and integrated approach to sustainable development. Emphasizing the importance of human resources for sustainable development, Morocco undertook an extensive inventory of national human and

organizational resources in this area. The inventory proved helpful in the development of the set of 65 Moroccan Indicators of sustainable development, which are embedded in a pressure-state-response framework. Currently, the related driving force – pressure state-impact-response framework is used for the new state of the environment report. In Morocco, sustainable development indicators have not yet fully utilized in national development strategies. In Morocco, as in many other developing and developed countries, the coherence between sets of development indicators is low. For example, only 14 of the Moroccan sustainable development indicators are included in the set of 68 development indicators used for development planning purposes. The lack of coordination between responsible ministries and agencies is a major reason for a lack in coherence.

D. Indicators of Sustainable Development Future Areas of Work

59. Prof. Bedrich Moldan from the Scientific Committee on Problems of the Environment (SCOPE) spoke on the "Assessment of Sustainability Indicators" project. The project, jointly undertaken by SCOPE and UNEP, has been developed in the context of the commitment to and support of the CSD-ISD process by SCOPE and by Prof. Moldan personally, which dates back to the early days of the Commission of Sustainable Development. It will result in a book entitled "Sustainable Development: How to Measure Progress Through Indicators". A major workshop in 2004 discussed most papers in the book. The interested general public, academia, agencies as well as policy makers are the target audience of the book. Among many other insights, the project found that sustainable development strategies and indicators are increasingly developed hand-in-hand. Composite indicators were identified as important format for which further research is needed.

60. In his presentation on "Indicators for Sustainable Development: Proposals for the Way Forward", Dr. László Pintér from the International Institute for Sustainable Development (IISD), noted that the potential of sustainable development indicators to influence policy is to a large extent still unrealized. There is no consensus on the design and policy relevant use of single aggregate indices suitable for the measurement of progress towards sustainability at a global or national level. The development of a small core set of indicators is an important trend, as is the linking of indicators to political or scientific goals and to performance measurement. Capital-based approaches have made important theoretical progress, but physical measures should accompany monetary ones. The CSD-ISD had both a sizeable direct impact on pilot testing countries as well as an indirect impact by putting sustainable development indicators on the policy agenda. However, the menu-based approach has not lead to a desired level of commonality among national indicator sets. For the future, four different scenarios might characterize the national and international work on sustainable development indicators: Indicator Zoo (Status-quo scenario), Global Cooperation, Global Integration, and Synergy World. A pragmatic approach could implement the fourth scenario, and incorporate some elements of the second scenario, by adopting annual or multi-year work programmes on small sets of indicators. Such an approach could strengthen synergies with accounting systems as well as with Millennium Development Goal indicators, better integrate sustainable

development indicators and strategies, promote peer or audit reviews, and revitalize capacity building programmes.

61. In the discussion, participants agreed that global cooperation is not only the most promising and realistic option for the near future, but also required to advance sustainable development. International work programmes focusing on selected priority indicators would be useful to advance the development and implementation of national sustainable development indicator systems as well as strategies. The results should be effectively disseminated to countries. Translation of publications and important documents and reports into languages other than English is critical in this regard. An international work programme should include national pilots to ensure that international and national work is connected and mutually supportive.

62. Many country representatives reported that synergies between the use of SDI and MDG indicator initiatives on the national level are currently low. As both sets are policy oriented and follow a similar structure, many policy makers regard them as competitive rather than complementary products and processes. Efforts to develop a single comprehensive set at the national level have not been successful. The fact that the responsibility for the two sets is dispersed among different ministries and agencies, both on national and international level, contributes to the low synergy.

63. Some participants pointed out that synergies between policy-oriented sets of sustainable development indicators and accounting-based information systems may be limited. In order to be policy relevant, it is necessary, but not sufficient, that indicators are based on up-to-date data.. There is a time lag with the release of official statistics and national accounts, which may impair the timeliness of SDI indicators. The construction of environmental and social satellite accounts based on preliminary national accounts may mitigate the problem.

64. The meeting discussed the merits of aggregate indices. Some participants saw few benefits from such indicators. Despite their usefulness for communication, there are persistent challenges associated with statistical soundness and arbitrariness in choosing and weighing the indicator components. However, these problems may be less severe in small-scale composite indices covering single themes. As a result of these and other underlying problems, aggregate indices may and often do result in inaccurate ranking of countries. This is perhaps a more severe problem than aggregation per se.

65. Proponents of composite indices pointed at examples of how composite indices such as the Environmental Sustainability Index have contributed positively to policy changes, improved national analytical capabilities and direct attention to the importance of data collection. Transparency in both aggregation mechanisms and data sources is essential for meaningful indices. Other participants, however, cautioned that politicians will disregard indicators that are plagued with severe methodological problems. Therefore, composite indicators may reduce rather than enhance attention of politicians to sustainable development. Moreover, indices may indicate misleading trends if they are based on incomplete or grossly inaccurate data. Hence, they may prevent policy choices that would

make development more sustainable. Various composite indices also lead to very different rankings, which in many cases are related to the weighting schemes and the issues covered.

66. Many participants highlighted the importance of strengthening human resources for sustainable development, in general, and ISD, in particular, especially in developing countries. The need for capacity-building persists on how to raise awareness for pressing challenges in sustainable development and on how to mainstream sustainable development, including indicators, into policy frameworks and strategies. Often, progress in sustainable development is personalized rather than institutionalized, such that the separation of key staff members induces a severe loss of continuity. Specific capacity-building activities should address this problem. In this regard, participants noted the positive impact that the testing of the first set of CSD-ISD had on human resource development in participating developing countries. Capacity building activities on data collection and development should include the use of metadata systems. Collaboration with the scientific community in this area would be promising.

67. Indicators should have more importance within the CSD thematic cycles. The preparation of papers on indicators that correspond to the CSD's multi-year work programme could be helpful in this regard. Coordination with other UN organs and organizations, as exemplified in this expert group meeting, should be continued. There may be scope to further improve information exchange and dialogue between the Secretariat and member States in this area. Existing linkages with regional organizations should be expanded. The Commission on Sustainable Development has a very important role to play not only in providing guidance and support but also in acting as a catalyst for national policy makers to develop and strengthen their indicator programmes.

E. Summary and conclusion

68. In the concluding session, the Chair thanked all participants for their active participation in the expert group meeting. The CSD-ISD ought to be at the center of policy-making in order to have a sizeable impact on sustainable development. The meeting was an important intermediate step in the review of the CSD-ISD. The discussions led to a preliminary revised CSD-ISD of 54 core indicators, 33 additional indicators and 13 indicators to be developed (see Annex 4). The list will be circulated by the DSD, and a follow-up expert group meeting will finalize the revised indicators. This meeting is tentatively scheduled for early September 2006. In the meantime, DSD will contact concerned agencies directly for updating existing and preparing new methodology sheets. The agreed distinction between core and non-core indicators has the potential to increase the relevance of the CSD-ISD. The elimination of the four pillars (social, environmental, economic, institutional) from the presentation of the CSD-ISD will make the linkages among sustainable development issues more apparent.

69. The discussion on frameworks was very productive. Future work in this area should be encouraged. The capital based approach is a compelling concept that will be developed further through national and international efforts. The ongoing work on the System of

Integrated Environmental and Economic Accounting is very relevant for the derivation of indicators of sustainable development related to the environmental and economic sphere. Further synergies should be explored, not at least through increased inter- and intra-agency cooperation.

70. In the future, concerted efforts by many actors are necessary for enhancing global cooperation in the development and implementation of sustainable development indicators. DSD will plan to prepare background papers on indicators for upcoming CSD sessions in review years. Increased capacity-building on sustainable development by many global, regional and national partners continues to deserve an important place on the political agenda.