Prototype
Global Sustainable Development Report

Executive Summary

Acknowledgements: This report was drafted by the Division for Sustainable Development, UN Department of Economic and Social Affairs (DESA), with inputs from CBD, DESA, ECLAC, ESCAP, ECE, ESCWA, FAO, ILO, IAEA, IMO, OHRLLS, UNCCD, UNCTAD, UNEP, UNESCO, UNFCCC, UNFPA, UN-Habitat, UNIDO, WFP and World Bank. The IMF participated as an observer. We are especially grateful for the contributions of many scientists and economists. A complete list of contributors is available in the report.

Suggested citation: United Nations (2014). *Prototype Global Sustainable Development Report - Executive Summary. Online edition.* New York: United Nations Department of Economic and Social Affairs, Division for Sustainable Development, http://sustainabledevelopment.un.org/globalsdreport/

United Nations Department
of Economic and Social Affairs

RIO+20
United Nations
Conference on
Sustainable
Development

Division for Sustainable Development

Prototype

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Executive Summary

1. Sustainable development brought together the great global issues

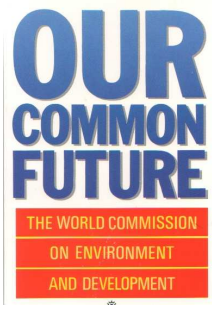
Since the creation of the United Nations, the world's peoples have aspired to make progress on the great global issues of peace and security, freedom, development, and environment.

Peace and security, freedom, development, and environment remain prominent aspirations today, and it has been increasingly acknowledged that they are closely interlinked. High-level panels and commissions, major documents, and global conferences have all made a moral and pragmatic case for progress in the UN Charter goals. Insufficient development progress can threaten peace and security and vice versa. Development provides the capacity to sustain nature's life support systems, but can also threaten them, in turn setting back development.

The concept of sustainable development brought together development and environment

Strong interdependencies are now recognized among the economic, social and environmental dimensions of sustainable development. Since the 1960s, natural and social scientists have highlighted a series of sustainable development issues and recommended integrated policy action and commensurate means of implementation, such as technology, finance, capacity building and trade.

In the Brundtland report, the concept of sustainable development is defined as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".



The Brundtland report of 1987, entitled *Our Common Future*, defined the concept of *sustainable development*, which is grounded in equity and shared well-being both within and across generations. Sustainable development was subsequently adopted as an overarching objective by Governments at the *Earth Summit of 1992 in Rio de Janeiro*, together with a set of *Rio Principles* and a global action plan, *Agenda 21*, which included many goals and targets, some of which informed the Millennium Development Goals a decade later.

The time has come to reconnect science and policy.

The policy framework itself emerged with limited direct scientific input. The World Commission on Environment and Development was dominated by politicians and little science was present at the Earth Summit in Rio de Janeiro in 1992. Ten years later at the Johannesburg World Summit on Sustainable Development, there was some scientific presence. In 2012 at "Rio+20", the UN Conference on Sustainable Development, science was very prominent. One reason is the emergence of sustainability science as a new interdisciplinary, unified scientific endeavour in the 2000s. It commanded an estimated 37,000 authors based in 174 countries in 2010.

At Rio+20, many scientific and policy assessment reports were presented in a large number of side events. Yet, the absence of a comprehensive and authoritative global sustainable development report was striking – twenty years after the Earth Summit. *Our Common Journey* (NRC, 1999) and *Sustainable Development in the 21st Century (UN, 2012)* were important steps toward an authoritative global report that would bring together the range of existing assessments across sectors, assessing past progress and exploring future pathways, taking into account the perspectives of different scientific communities across the world and also responding to the needs of policy makers for the best available scientific evidence on sustainable development issues in an easily digestible form.

2. A "prototype" Global Sustainable Development Report

The Rio+20 outcome document (paragraph 85k) calls for a Global Sustainable Development Report, in order to bring together dispersed information and existing assessments and to strengthen the science-policy interface at the high-level political forum on sustainable development (HLPF). The 2012 Secretary General's High-level Panel on Global Sustainability had a similar proposal. Following Rio+20, the UN Secretary-General tasked the Division for Sustainable Development of the Department of Economic and Social Affairs to undertake "*in-depth analysis and evaluation of trends and scientific analysis in the implementation of sustainable development, including lessons learned, best practices and new challenges, and cross-sectoral analysis of sustainable development issues*".[1]

It was decided to produce a "prototype" report that could illustrate a range of potential content, alternative approaches and various ways of participation. The prototype report will be useful in supporting Member States' deliberations on the scope and methodology of future editions of the Global Sustainable Development Report. The report should ideally inform the agenda and deliberations of the HLPF, the General Assembly and ECOSOC on sustainable development.

The prototype report is a UN system effort with participation of social and natural scientists and seeks to facilitate dialogue between scientists and decision-makers. It focuses on global sustainable development in terms of issues, impacts, institutions and technology. It maps sustainable development assessments and related processes and highlights emerging issues identified by scientists; assesses sustainable development progress; tells the "stories" of future pathways toward sustainable development based on the literature and discusses investment and technology needs; assesses various approaches to measuring sustainable development progress; identifies lessons learnt from national, regional and global case studies of the climate-land-energy-water-development nexus; presents illustrative science digests for decision-makers; and suggests a number of issues for consideration.

A UN Task Team was formed to work on the prototype report. An invitation was sent to the 53 UN entities comprising ECESA-Plus[2] of which 21 have actively partnered on this task: Convention on Biological Diversity (CBD), UN Department of Economic and Social Affairs (DESA), UN Economic Commission for Europe (ECE), UN Economic Commission for Latin America and the Caribbean (ECLAC), UN Economic and Social Commission for Asia and the Pacific (ESCAP), United Nations Economic and Social Commission for Western Asia (ESCWA), Food and Agriculture Organization (FAO), International Atomic Energy Agency (IAEA), International Labour Organization (ILO), International Maritime Organization (IMO), Office of the High-Representative for the Least Developed Countries, Land-locked Developing and Small Island Developing States (OHRLLS), United Nations Convention to Combat Desertification (UNCCD), United Nations Conference on Trade and Development (UNCTAD), United Nations Environment Programme (UNEP), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Framework Convention on Climate Change (UNFCCC), United Nations Industrial Development Organization (UNIDO), United Nations Population Fund (UNFPA), UN Human Settlements Programme (UN-Habitat), World Food Programme (WFP), and World Bank. The International Monetary Fund participated as an observer. DESA has reached out to scientific communities across the world, including through a number of expert group meetings. A multi-lingual crowd-sourcing platform (currently in English, Spanish and Chinese) has been used to collect a wider range of views from thousands of scientists across the world. In fact, key messages and findings of the report have emerged from the crowd-sourced views and evidence rather than being decided by UN staff or selected scientists. While this crowd-sourcing exercise proved a useful tool to identify new and emerging issues that scientists would like decision-makers to consider, protocols for evaluating non-conventional sources of scientific knowledge might be needed in the future.

3. Assessments for Sustainable Development

Assessments addressing broad and complex topics are typically prepared for decision-makers by drawing on large and representative groups of experts. They are problem-driven and typically synthesize scientific findings on complex issues, reducing complexities. They inevitably make judgments but generally aim to separate clearly descriptive from normative elements of the assessment. In order to support decision-making, statements specifying probabilities and uncertainties are essential but not easy to communicate.

International scientific assessments

Of the thousands of relevant sustainable development assessments, the present report consulted 205 international assessments: 57 international assessments suggested through the crowdsourcing website; 125 flagship publications of the UN system; and 23 outlook reports prepared by intergovernmental organizations. According to our crowdsourcing results, prominent intergovernmental scientific assessments and UN publications came out on top of the list of assessments that scientists considered important to bring to the attention of decision-makers.

Widening scope and multiple goals of international assessments since 2000, in line with emergence of sustainability science.

Since the 2000s, assessments have started to widen their scopes and to consider "co-benefits", or synergies, and multiple goals. Notable examples are the Millennium Ecosystem Assessment (2005), the International Assessment of Agricultural Knowledge, Science and Technology for Development (2008), and the Global Energy Assessment (2012). Sustainability science is a field defined by the problems it addresses rather than by the disciplines it employs, similar to ''health science". In 2012 alone, more than 40,000 authors from 2,200 cities around the world published some 150,000 articles on sustainable development.

There are thousands of assessments…

Most of them focused on specific systems and sectors. The database for the *Assessment of assessments on oceans* contains 1,023 assessments and the one for the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* contains 215 assessments at multiple scales. For other areas there appear to be no comprehensive, regularly updated databases of assessments.

…that differ in terms of scope, scale, organization, process, participation, resources and perceived policy relevance.

The landscape of sustainable development assessments is very diverse and it is difficult to make general observations. A handful of prominent international assessments (see table 1 below) have served as models for new initiatives. A few of them have been huge undertakings with hundreds or thousands of scientists participating and price tags of hundreds of millions of US dollars.

The number of assessments and the resources devoted (to different sectors and themes) seems to be proportional to the associated economic stakes. This has made climate change assessments the most proliferating area over the past 20 years.

Table 1: Simple typology of international sustainable development assessments

Type	Refer to as	Examples	Description	Link to political process	Participants nominated/ selected by	Drafted by	Text approved by	Frequency	Normative or descriptive	Type of knowledge assessed
Intergovern-mental scientific assessments (IGSA)	IPCC model	IPCC, IPBES	Regular IGSA	Formal	Governments	Scientists	Governments, peers	Regular	Primarily descriptive	Academic, peer-reviewed
	IAASTD model	IAASTD	Ad hoc stakeholder IGSA	Formal	Multi-stakeholder Bureau	Scientists	Governments	Ad hoc	Primarily descriptive	Academic and traditional/local knowledge
	GEO model	GEO	Regular UN science publication with formal link	Formal	Governments, stakeholders	Scientists guided by UN	Peers	Regular	Descriptive and normative	Academic, peer-reviewed, UN
	AH model	Asian Highway expert group	Intergovern mental UN expert group	Formal	Governments	UN staff guided by experts	UN	Regular	Descriptive	Governments, UN, academic, private sector
Scientific, technocratic assessments (STA)	CDP model	UN Commit-tee for Develop-ment Policy	Standing UN expert groups with formal reporting to governments	Formal	UN Secretary General	UN staff guided by Committee members	Committee	Regular	Normative	Academic, peer-reviewed, UN
	GSP model	High-level Panel on Global Sustai-nability	Ad hoc initiatives of the Secretary General	Formal, Weak	UN Secretary General	UN staff guided by Panel	Panel	Ad hoc	Normative	UN, governments, academic, NGOs, stakeholders
	UN flagship model	GBO, WESS	UN flagship publications, drawing on UN expert groups, and linked to UN process	Formal, Weak	UN	UN staff jointly with experts	UN	Ad hoc or regular	Descriptive and normative	Academic, NGOs, UN, government, stakeholders
	Pre-Summit stock-taking	UN SD21 study	Stocktaking made in preparation for high-level international conferences	Formal, Weak	UN	Lead authors, sometimes with UN staff	UN	Ad hoc	Descriptive	Academic, practitioners' views
Scientific research collabo-rations (SRC)	GEA model	Global Energy Asses-sment	Collaborative scientific collation of scientific knowledge	Informal	Peers	Scientists	Authors, Peers	Ad hoc	Descriptive and normative	Academic, peer-reviewed
	MEA model	Millen-nium Eco-system Asses-sment	Identification of scientific basis and knowledge gaps for action	Non-govern-mental	Selected by science panel, endorsed by board	Scientists	Peers	Ad hoc	Descriptive and normative	Academic, peer-reviewed, stakeholders
	CML model	Census of Marine Life; Future Earth	Collaborative scientific research programme	Non-govern-mental	Peers	Scientists	Authors, Peers	Ad hoc	Descriptive	Academic, own research

Note: Decreasing role of governments from top to bottom.

The IPCC model of scientific assessments has served as an institutional model for an increasing number of assessments, including at the national level.

The IPCC model of intergovernmental scientific assessments has been very influential in shaping more recent assessments that aimed to strengthen the science-policy interface. In fact, IPCC-style assessments have been instituted also at the national level, e.g. in Austria (APCC) and Hungary. The IPCC model has been the most successful institutional model of formalizing the science-policy interface. It has put key problems identified by science high on policy makers' agendas and has also enabled science to inform solutions. It is not clear if any other model has the potential to mobilize the scientific community to the same extent. At the same time, the IPCC model of assessment has received criticism from scientists and beyond. Transparency, plurality of perspectives and effective participation of scientists from developing countries have been

identified as must-haves to ensure global credibility. Major efforts are required to support science-capacity in developing countries and to strengthen the institutional mechanisms to support evidence-based policy making everywhere.

The UN flagship publication model has advantages of low cost, wider stakeholder participation and a plurality of views.

UN publications can tap a wider range of knowledge beyond the peer-reviewed, academic literature. They are directly linked to a UN process which facilitates consideration by decision makers. Diversity of views can provide a wider range of options to decision-makers. Hence overlaps among UN assessment publications do have their benefits, while a loose coordination among assessments and outlooks could benefit decision-makers.

Some global assessments may be less relevant for countries with special needs than sub-regional or national assessments.

Global assessments might not necessarily reflect the unique situation of small island developing countries, least developed, land-locked developing countries since vulnerability factors that are most relevant for these countries do not always show up as "crucial" in global assessments. Similarly, smaller developed and developing countries do not necessarily see their particular challenges and action priorities reflected in the global sustainable development debate and related assessments. Hence, there may be a need to build global assessments on national ones.

National sustainable development assessments

Approaches, methodologies and outcomes vary greatly among countries which does not allow for direct cross-country comparisons. National sustainable development reports were submitted by 69 countries in preparation for Rio+20 in 2012. Only four of these reports were from developed countries, even though such reports exist for roughly half of all developed countries. The overwhelming majority of the national reports submitted for Rio+20 were from developing countries in Africa, Latin America and the Caribbean. Yet, many countries continue to face great capacity constraints in assessing and advancing sustainable development knowledge. The country coverage of MDG progress reports (148 countries) has been three times better than the average for Commission on Sustainable Development (CSD) progress reports and twice better than for Rio+20 reports, indicating the relatively low importance to date attached to sustainable development by UN entities and Member States.

Assessments indicate big differences in terms of national priorities under the sustainable development agenda.

405 national assessment reports on specific thematic topics had been submitted to the CSD for implementation cycles 2004 through 2011. Most reports were submitted on chemicals and waste; desertification, land degradation, and drought; and sustainable consumption and production. Topics in the mid-range were mining, rural development, sustainable transport, water and sanitation, sustainable cities and human settlements, and atmosphere. Climate change had the fewest national reports by countries.

Emerging issues

The UN crowd-sourcing platform registered 1,115 contributions from scientists around the world who voted on each other's ideas and contributed with a total of 96 issues they would like decision-makers to consider for action. The top eight on the list are: regional conflicts due to global competition for natural resources; the climate-land-energy-water-development nexus; political instability and social unrest from increased wealth inequalities; child labour; non-existent or decreasing environmental justice in developing and developed countries; youth unemployment; persistence of poverty in poor and even in rich countries; anthropogenic reductions in net primary productivity of biological resources. Other priorities are listed in the prototype report.[3]

4. Review of progress from 1950 to 2013

The challenge is to eliminate poverty and hunger; feed, nurture, house, educate and employ more than nine billion people; secure peace, security and freedom; and preserve the Earth's basic life support systems.

The report looks at three generations into the past (1950-2013) and two generations into the future (until 2050). The challenge is to learn from what we have tried in the past, in order to put our societies and economies firmly on the path to sustainable development by 2050. The report takes an integrated approach that looks at clusters of issues and their inter-linkages rather than specific sectors or specific topics.

Sustainable development trends and progress

Historical progress towards sustainable development has been mixed. Some progress has been at the expense of worsening trends in other respects.

The world has managed to feed, nurture, house, educate and employ on the order of an additional 800 million people every decade from 1970 to 2000, and even 1.1 billion people in the 2000s. In the past 12 years alone, we have built cities for 770 million people (equivalent to 93 New York cities), more than in any decade before. These are enormous achievements. Today's world GDP is more than ten times larger than in 1950 and average per capita GDP is four times larger. Yet, we have not managed to employ our much greater wealth and technological capacity to eliminate poverty and hunger. 850 million people go hungry today, a number which has hardly changed over several decades. There are two hundred million more slum dwellers today than twenty years ago (see tables 2 and 3 below).

Table 2: Global number of people, in billions, 1950-2012

	1950	1970	1990	2000	2012
In absolute poverty: living on less than US$(PPP)1.25 per day			1.95	1.78	1.17
Employed but living on less than US$1.25 per day			0.83	0.69	0.38
Living on less than US$2.15 per day			3.1	3.3	2.7
Below relative poverty line in developing world			2.5	2.7	2.8
Hungry		1.0	0.8	0.8	0.85
Without safe drinking water			1.25		0.74
Without access to sanitation			1.80		2.44
Without access to electricity		1.8	2.0	1.65	1.27
Migrants			0.16		0.21
Above 60 years of age	0.2	0.25	0.5	0.6	0.81
Internet users	0	~0	0.003	0.36	2.4
Urban residents	0.75	1.35	2.28	2.86	3.63
Slum dwellers			0.67	0.78	0.87
Population of least developed countries	0.20	0.31	0.51	0.66	0.88
World population	2.5	3.7	5.3	6.1	7.1

The poor have suffered most the impacts of the rapid increase in materials consumption.

The unabated rise in the scale of materials consumption has increased global environmental, social and economic pressures. There is increasing evidence that we are jeopardizing several of the Earth's basic life support systems. Countries and people trapped in persistent poverty have probably suffered most from these impacts. And future generations will most likely face much greater challenges to meet their own needs.

Table 3: Overview of global sustainable development trends

Sustainability	*Development*
Nature Anthropogenic interference with one-half of the terrestrial ecosystems and one-quarter of the freshwater supply. Biodiversity continues to decrease at rates 100 to 1,000 times their pre-human levels. Global CO_2 emissions from fossil-fuel burning, cement manufacture, and gas flaring have increased at an accelerated rate. They increased from 24.8 $GtCO_2$ in 2000 to 35.1 $GtCO_2$ in 2012 - the largest increase in any decade in human history. 41 per cent of the oceans showed high human-induced impacts on marine ecosystems in 2012.	**People** World population reached 7 billion people, 80 million added each year. Life expectancy extended by 22 years with persistent gaps between regions and a widening gap between men and women and since 1950. Better global health and shifting disease, but more years in injury and illness. The 2000s were the first decade since 1980 when both the absolute numbers and the proportion of people in absolute poverty declined. However, the number of relative poor in the developing world has continued to increase ever since 1980. 850 million people suffer from hunger which is slightly more than in 1990 but 150 million less than in 1970. Universal primary education achieved in most parts of the world. The literacy rate of 15- to 24-year-olds in developing countries reached 88 per cent in 2011. In stark contrast to twenty years earlier, today women dominate tertiary education in most parts of the world. 740 million people lack access to safe drinking water (i.e., 500 million fewer than in 1990) and 2.4 billion people lack access to basic sanitation (650 million more than in 1990). Water pollution continues to claim the lives of millions. Great improvements in modern energy access since 1990, but in 2010 there were still 1.27 billion people without access to electricity and 2.59 billion without access to clean cooking fuels. Increased aging including in many developing countries. 810 million people are now older than 60 years. In 2010: 215 million international migrants (59 million more than in 1990) and 740 million internal migrants. 383 million employed people getting by on less than US$1.25 per day – half the number of 1990, but no reduction in LDCs, LLDCs and SIDS. Intergenerational social mobility earning, wage and educational mobility varied widely across countries Mixed progress on human security and human rights. Overall well-being of people – as measured by HDI - has substantially improved since 1950.
Life support Human settlements now cover 7% of the world's ice-free land cover and their croplands another 21%. The protected terrestrial and marine areas have been greatly expanded in developed and developing countries. Loss of half of the world's forests historically to domestication. Tropical forests declined at around 12-14 million hectares per year in both the 1990s and 2000s, and a similar amount was degraded. In contrast, temperate and boreal forests were reforesting since the 1980s. Global arable land and permanent crops expanded by 160 million ha since 1961, due to expansion in developing economies, but the world likely reached peak farmland by 2010. Humanity claims about 24 per cent of the global terrestrial net primary production, more than ever before. Local and regional freshwater shortages, and water stress was widespread in one-third of the world. The proportion of overexploited fish stocks tripled from 10% in 1970 to 30% in 2012. Many concentrations of local air pollutants have decreased, but the health burden of local air pollution remains large, especially in megacities of developing countries. Ozone layer on a long-term path to stabilization by 2020/2030. Degraded coastal zones where half the world population lives.	**Economy** Affluence has increased amidst persistent poverty. The world economy doubled since 1990 to US$69 trillion in 2012. The Genuine progress index per capita has slightly decreased since 1978. Consumption remains grossly inadequate for the poorest. Greater material consumption and less per unit of value, but progress in technology access and performance has fallen far short of the requirements for sustainability. From 1988 to 2008, all gains in real income have been reaped by the super-rich in all countries and the rising middle-class in developing countries. Growing income inequality in many parts of the world. Trade has grown at more than twice the rate of economic growth since 1950. Total assistance to developing countries more than doubled since 2000 to US$126 billion in 2012. The proportion of net ODA to donors' gross national income regained their 1990 levels of 0.32% in 2010, up from 0.22% in 2002. Estimates for 2012 are 0.29%. Energy almost tripled between 1970 and 2010 – reaching 493EJ. Renewable energy share increased from 5.4% in 1970 to 7.0% in 2000 and 8.2% in 2010. Growing but slowing water withdrawals.
Community More State-based armed conflicts than in the cold war. Greatly reduced number of deaths from non-State armed conflicts, including terrorism. Diversity of cultural heritage, traditions, and traditional knowledge and 90% of indigenous languages threatened, but also indications of some revivals.	**Society** Extraordinary changes in developed and developing countries alike, in terms of values, attitudes, and actual behaviour, in particular the attitudinal and behavioral shifts in sex and reproduction, the role of women, the environment, and human rights. Fewer stable families in most developed and developing countries than in past decades. In developed countries, crude marriage rate halved since 1970 and divorce rate increased. The average duration of marriages has stayed constant at 10-15 years. Widening governance and globalization. Power has shifted from the nation State upward to the global level and downward to the local level, and at all levels from the public to the private. Crisis of multilateralism. In most countries where a high level of societal consensus existed on intergenerational equity, it has been lost or come under pressure.

Note: Red colour coding indicates trends that scientists have expressed concerns about. Green indicates what is typically considered a trend toward sustainable development. Black indicates a neutral or mixed trend.

Progress of implementation of Agenda 21 and the Rio Principles

A comprehensive review of the implementation of Agenda 21 and the Rio Principles was undertaken in DESA in the context of the SD21 project for Rio+20.[4]

Success on Agenda 21 has been highly variable and limited, with progress deemed good on only 5 of 39 chapters.

Based on expert assessment, most of the 39 chapters were rated as having made only limited progress. Three chapters (chapter 4 on Changing consumption patterns; chapter 7 on Promoting sustainable human settlement development; and chapter 9 on Protection of the Atmosphere) were rated as having made no progress or witnessed a regression. Only five chapters were rated as having achieved good progress or better (chapters 27 and 18 on involvement of NGOs and local authorities, chapter 35 on science for sustainable development, chapter 38 on International institutional arrangements, and and chapter 39 on International legal instruments and mechanisms). Agenda 21's biggest success has come through driving ambition on what sustainable development outcomes are achievable on a sector by sector basis. For example, our understanding of biodiversity, of the contribution that agriculture makes to development or of the role of indigenous peoples in society, has been advanced in no small part through Agenda 21. Furthermore, Agenda 21 has engendered a much stronger notion of participation in decision-making. However, the sectoral format for Agenda 21 may have been unhelpful towards fostering integrated analysis and decision making.

Progress on the Rio Principles has been slow. Limited progress was made on only 17 of the 27 principles.

The review of the Rio Principles shows that many of the principles have been transposed into further international laws or national instruments, but have not necessarily filtered down into meaningful action in practice. Without effective compliance and enforcement mechanisms there is little to ensure that States comply with the objectives and aspiration of the principles. One exception is Principle 10 on access to environmental information which is enshrined in the Aarhus Convention and which covers most European Union (EU) members.

Progress has been mixed towards achievement of goals or commitments in 19 SDG-relevant focus areas

Initial discussions of the UN Open Working Group (OWG) on Sustainable Development Goals (SDGs) considered 19 focus areas as potential areas for future SDGs. These have now been narrowed down to a fewer number of areas with a view to the OWG's finalizing its report by the end of July 2014. An analysis of the initial 19 focus areas, a number of which build on the MDGs, suggests that progress towards goals or commitments in 11 of the 19 focus areas is off-track, in 4 shows limited or mixed progress, and in another 4 shows good progress or early achievement (poverty eradication; food security and sustainable agriculture; water and sanitation; and health). Clearly, the level of progress depends, *inter alia*, on the level of ambition of the goal or commitment in the first place. Early achievement of a goal might reflect faster than foreseen progress or an inadequately ambitious goal. For example, it is doubtful whether the target of improving the lives of 100 million slum dwellers was sufficiently ambitious, given the rate at which the population of slum dwellers has expanded since 1990.

Making sense of the debate on sustainable development progress

Views expressed on sustainable development progress oftentimes appear to be contradictory….

Typical views include the following:

- *Scaling-up:* Elements of a sustainable future are already visible. What is needed is to quickly scale up these initiatives.
- *Implementation gap:* We know what should be done and we have the means to do it. All that is needed is political will to implement commitments in terms of finance, technology and capacity development.

- *Green economy:* Current environmental trends are unsustainable. Markets are the most efficient way to guide us on the right path. What is needed is full internalization of environmental externalities and expansion of markets for ecosystem services.
- *Change behaviour:* We are on a fundamentally unsustainable path. Drastic changes in behaviour and lifestyles are necessary to achieve the transition towards sustainable development.
- *Biotic regulation:* Humanity has transgressed the Earth's carrying capacity decades ago. Only an immediate stop to ecosystem destruction, as well as population control and large-scale restoration of ecosystems, might restore global biotic regulation and prevent collapse of ecosystems, including the human species.

…but are not necessarily so when the underlying assumptions are made explicit.

Different conclusions are reached by choosing different scopes and completely different time scales, and arguments are made at very different levels, referring to: (a) sustainable development as an overarching goal, including the scientific basis that underpins it; (b) the overall approach that should be followed to achieve sustainable development; (c) the nature and content of sustainable development strategies; (d) the details of blueprints or action plans (Agenda 21) upon which action is based; (e) progress and shortcomings in the implementation of specific actions and plans. Making these differences explicit might help resolving many of the perceived differences in the sustainable development debate.

The consequences of continuing along our present course of incremental progress until 2050

No one knows which path the world will take in the next 40 years. But there has been an impressively strong consensus among experts since the 1970s about the major sustainability issues and the broad direction of trends, even though the precise magnitude and dynamics of the future sustainability challenge and improvements in eco-efficiency remain unknown. The majority of– but not all – scientists are concerned about the trend outlook for the next two generations.

Excessive materials consumption by 6 billion people at the expense of another 3 billion people living in poverty.

The dynamics-as-usual world is one of excessive materials consumption by 6 billion people in both "North" and "South" which will be at the expense of 3 billion people living in poverty (i.e. less than $2.15 a day), suffering much of the negative consequences of the others' overconsumption which by its sheer scale will have transgressed the majority of "planetary boundaries", heightening the risk of eventual global ecosystem collapse. Even without "global collapse", the resulting world in 2050 appears deeply unpalatable insofar as it would deprive billions of people of the better lives that are in principle within their reach. Such potential collapse is not included in any of the mainstream trend scenarios. Hence, the following 2050 picture is an optimistic view of the consequences of continuing as in the past: a more crowded world with persistent poverty and hunger; one billion people still lacking access to basic services; billions excluded from otherwise improved global health; an energy-hungry, fossil-fuelled world; a "thirsty" world with two-thirds of the world population under water stress; a global economy repeatedly wracked by price shocks and supply disruptions; fewer deaths from indoor air pollution but further deterioration of urban air quality; fewer forests; global collapse of ocean fisheries; accelerated increase in GHG emissions and global warming; continued loss of biodiversity; massive human interference with the phosphorus and nitrogen cycles well beyond safe thresholds; and a resurgence of resource-related conflicts. We can also expect some positive developments such as universal primary and secondary education, and a greatly enhanced women's empowerment.

5. Future pathways toward a "better future" in 2050: sustainable development scenarios

The challenge before us is to achieve a global sustainability transition by 2050. We will need to eliminate poverty and hunger; feed, nurture, house, educate and employ more than nine billion people; secure peace, security and freedom; and preserve the Earth's basic life support systems.

In response to the question "What kind of world would you like to see for yourself, your children and grandchildren in 2050?", scientists submitted ideas of immediate development and social concern.

The fifteen most popular ideas identified through crowdsourcing capture areas of immediate development and social concern, such as poverty, hunger, vitamin deficiencies, social protection, universal access to basic services and universal education, as well as human rights and access to justice, redress and remedy for all. Least frequently mentioned were suggestions to reduce water stress, reduce air pollution and various climate change targets. The report sketches future sustainable development pathways derived from scenarios of leading modelling teams.

The following scenarios were used: (a) Global Energy Assessment Scenarios by IIASA, Austria; (b) Rio+20 scenarios by PBL, Netherlands; (c) Alternative pathways toward sustainable development and climate stabilization (ALPS) by RITE, Japan; (d) Shared Development Agenda (SDA) Scenarios for Rio+20 by SEI, Sweden; (e) Green growth scenarios for Rio+20 by OECD; (f) Great transition scenarios (2010 update) by Tellus, USA; (g) Exploratory WITCH scenarios by FEEM, Italy; (h) Global resource scenarios of the climate-land-energy-water nexus by KTH, Sweden, and United Nations-DESA; (i) Sustainable Development Global Simulation by National Academy of Sciences of Ukraine, Geophysical Center of Russian Academy of Science and Ukrainian Branch of World Data Center. In addition, a number of prominent recent reviews of scenarios were considered, where appropriate, including WWF's Living Planet, UNEP's GEO-5 scenario review, the World Business Council for Sustainable Development's sustainable vision 2050 and the World Economic Forum's global risk report. These scenarios have presented alternative future pathways towards a world in 2050 that would be more sustainable in important environmental and social dimensions and would promise a decent quality of life for all people.

The pathways lead toward a world where by the latter half of the 21st century all regions will be developed, poverty will be eradicated, and the demand on natural sources and sinks will not exceed their regeneration capacity…

The sustainable development scenario in this report reflects an integrated focus on the three dimensions of sustainable development, as well as an explicit integration of (dynamic) planetary limits to ecosystems capacity. Explicit attention is given to achieving and sustaining MDG-related goals relating to basic access to services, education, and health, and to reducing aggregate income disparities across countries and regions in the long term. This scenario implies new economic structures, different allocation of capital and investment between public and private sectors, and cooperative management of the commons at the global and national levels. If we follow this suggested sustainable development pathway, we could expect a world in 2050 where hunger and poverty have been effectively eliminated; a world with universal access to improved water sources and basic sanitation, to electricity and modern cooking fuels; a world with GDP per capita of more than US$10,000 everywhere (in PPP terms); a world with much greater energy efficiencies and energy conservation; a world with greatly reduced local air pollution, slowly reversed deforestation, and restored fish stocks; a world with global average temperature change limited to 2°C above pre-industrial levels. Biodiversity could possibly be stabilized at 2020 levels.

…but this world in 2050 will still be far from a utopia.

Yet, this world in 2050 still has its share of problems and challenges. Billions of people would still be under water stress and flood risks would have worsened in many places. Chemicals would likely continue to pose serious threats to human health. Human interference with the global phosphorus and nitrogen cycles would most likely continue to rise, despite great efforts.

We need to push technology performance and diffusion to their limits – increasing eco-efficiency by at least a factor of 3.2.

We know it is technically feasible to improve global eco-efficiency by a factor of 4 or 5 by 2050. This would allow global wealth to be multiplied by 2 or more, while halving resource and energy use. The pathway described here shows the way toward a factor of 3.2 improvement, somewhat less than what is technically feasible, but still highly ambitious.

Goals and targets in sustainable development scenarios for Rio+20											
Vision		**Theme**	**Types of goals, targets, and outcomes**	**IIASA-GEA**	**PBL**	**SEI**	**OECD**	**RITE-ALPS**	**FEEM**	**GSG**
To develop	**People**	Poverty	Eradicate hunger by 2050		X					X
			Eliminate poverty by 2050			X				
		Access	Universal access to improved water source and basic sanitation by 2050		X		X			
			Universal access to electricity and modern cooking fuels by 2030 {or 2050}	X	X	{X}				
		Health & education	Decreased impact of environmental factors on DALYs		X					
			Universal primary education by 2015						X	
	Economy	Income	GDP per capita > US$10,000 PPP in all regions by 2050			X				
			Income convergence; catch-up of Africa by 2050						X	
		Resources	Primary energy use less than 70GJ per capita by 2050						X	
			Primary energy use per capita is only 13% higher in 2050 than in 2010, and 48% higher in 2100.					X		
			Use of renewables increase by 3.1 times from 2010 to 2050					X		
			Water demand increases from 3,560 km^3 in 2000 to only 4,140 km^3 in 2050				X			
		Security	Limit energy trade, increase diversity and resilience of energy supply by 2050	X						
			Population weighted average of energy security index increases only by 2.3					X		
To sustain	**Life support**	Resources	Limit the increase in the number of people under severe water stress to an additional +2 bln {or +1.4 bln) from 2000, reaching 3.7 bln {or 3.1bln} in 2050				X	{X}		
			People under severe water stress <2 bln until 2050 {or 2.9 billion in 2100}					{X}		X
			Reduce number of people living in water scarce areas vs. trend scenario		X					
			Reduce the area for energy crop production to almost zero by 2020. From 2010 to 2050, limit increase in cropland area for food production to +15%, and reduce the irrigated area for food production by 5%					X		
			Cumulative fossil fuel use limited to <520 Gtoe from 2010 to 2050					X		
			Slow and later reverse deforestation and land degradation							X
			Slow overfishing and later restore fish stocks							X
		Air pollution	Keep PM2.5 concentration below 35 µg/m^3 by 2030		X					
			Reduce NO_x, SO_2 and black carbon emission by 25% vs. baseline by 2050				X			
			Reduce SO_2 by 42% and black carbon by 21% by 2050 vs. 2010					X		
			Reduce premature deaths due to air pollution by 50% by 2030	X						
	Nature	Climate change	Limit global average temperature change to 2°C [or 2.8°C] above pre-industrial levels with a likelihood of >50% {or 60%} by 2100.	X	X	{X}	X	[X]		X
			Atmospheric GHG concentration stabilization below 450 ppm [or 350ppmv] {or 550ppmv} CO_2-eq. by 2100		X				{X}	[X]
			Limit ocean acidification to keep aragonite stable, with pH=8.0 in 2150					X		
		Biodiversity	By 2020: Prevent extinction of known threatened species and improve situation of those in steepest decline; halve the rate of biodiversity loss; halve the rate of loss of natural habitats and reduce degradation and fragmentation by 2020; conserve at least 17% of terrestrial and inland water. By 2050: stabilize biodiversity at the 2020/2030 level		X					
			CBD Aichi protected area targets of 17% of terrestrial and inland water areas and 10% of coastal and marine areas achieved by 2020		X		X			
		Phosphorus and nitrogen cycles	Phosphorus removal in wastewater treatment increases from 0.7 Mt in 2000, to 1.7 Mt in 2030, to 3.3 Mt in 2050				X			
			Reduce N/P use where possible, but without harming the ability of the agricultural system to meet the hunger target		X					

Sources: IIASA-GEA (Riahi et al., 2012)[5]; PBL (van Vuuren et al., 2012)[6]; SEI (Nilsson et al., 2012)[7]; OECD (2012)[8]; RITE-ALPS (Akimoto et al., 2012)[9]; FEEM (2011)[10]; GSG (Raskin et al., 2010)[11].

To achieve such a goal, global cooperation is needed to accelerate environmentally sound technology transfer and diffusion…

Technology cooperation needs to be enhanced, in order to accelerate the transfer and diffusion of environmentally sound technologies. Technology transfer is happening too slowly to tackle the big sustainable development challenges. And technological capabilities in developing countries need to be substantially strengthened if they are to partake actively of the major technological transformations that lie ahead.

So far, technology needs have not been mapped systematically in the area of clean and environmentally sound technology facilitation, and views vary significantly as to whether the international programmes and mechanisms to assist in terms of capacity building or otherwise correspond to the existing needs. Moreover, data are limited and fragmented for assessing the magnitude and nature of the technology gap that developing countries are facing, and there is a need to survey technology needs at the country level.

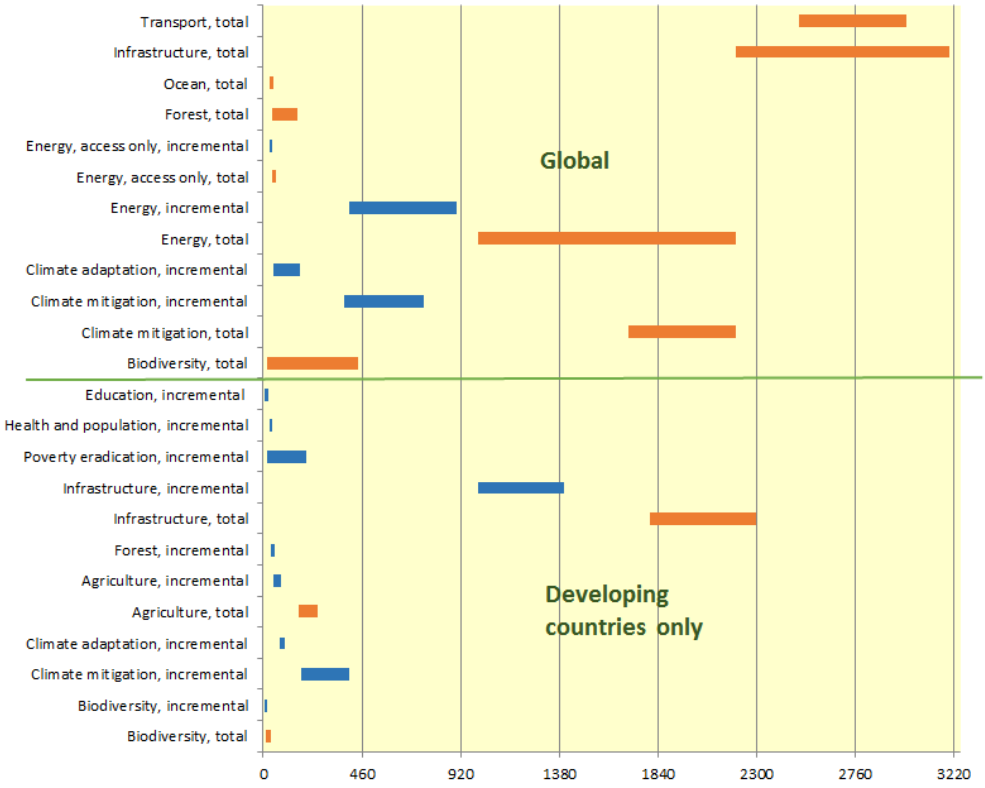
… to direct wisely the one trillion US dollars that are spent on research and development every year…

The good news is that the research contribution of middle- and low-income countries more than doubled over the last 15 years. And continued gains in the education, skills and capabilities of billions of people in coming decades hold tremendous potential both to boost productivity and incomes and to help solve our global sustainability challenges.

…and to meet the global investment requirements.

To achieve a sustainability transition, special efforts are needed to meet the estimated global investment requirements. While assessing financing needs for sustainable development presents considerable conceptual and practical challenges, analyses of investment requirements for sustainable development in the coming decades conclude that financial needs are significant, of the order of the several trillions per year. Figure 1 below presents orders of magnitude estimates for investment requirements in various sectors, obtained from the literature.

Figure 1: Orders of magnitude of investment requirements from various sectors from the literature



Legend: Blue bar stands for incremental needs and orange bar stands for total needs. *Source*: DESA (2013)[12]

The global scenarios show what could be achieved if we were able to overcome - at a global level - all the socio-economic and political constraints and make major technological advances.

While these scenarios differ in various aspects, they are nevertheless fairly similar in spirit and content. When measured against goals suggested by some scientists, the scenarios' levels of ambition are limited both in terms of their scope and their target levels, even though they are highly optimistic in terms of assuming that we can overcome major socio-economic and political constraints.

The sustainable development scenarios show a high level of agreement on overall policy conclusions.

Despite a variety of modelling approaches and sustainable development goals, the sustainable development scenarios for Rio+20 agree to a large degree in terms of their overall conclusions: there are numerous, feasible pathways toward sustainable development. The scenarios show the challenges, benefits and limits to achieving the multiple objectives of sustainable development such as: eradicating poverty, improving living standards, reining in materials consumption, and increasing end-use resource efficiency. Making progress in one dimension can lead to both synergies and trade-offs. Complex trade-offs related to the global commons need to be tackled globally. There is no single solution or policy for sustainable development. Politicians' sustainable development goals have become increasingly ambitious, while their attainment has become increasingly difficult. Education, RD&D and population goals potentially have very large synergies with the development and environmental dimensions. A broad pursuit of sustainable development is far superior in performance over pursuing single-issue objectives in isolation (e.g. promote economic growth first and deal with its environmental costs only later).

The lessons learned from scenarios at the global science-policy interface for sustainable development….

There is no agreement on the role of science and scenarios in policy making. Scenario models reflect specific worldviews that have greatly shaped those of decision-makers since the 1970s. The underlying assumptions should be made clearer to decision-makers. Decision-makers have tended to "cherry-pick" model results. It is easier to agree on goals/targets than on policies, actions or indicators. There is no consensus on limits, but almost everyone agrees that technology is important. More effort is required to develop sustainable development models that are capable to minimize if not resolve trade-offs across the different dimensions of sustainable development or different policy objectives.

For the past forty years, global models have been looking for applications, rather than vice versa. The result has been fragmented modeller communities focusing on applications by seizing "windows of opportunity" such as periodic global assessments or the preparations for Rio+20. More resources are needed for model development tailored to broad, new problems.

6. How to measure sustainable development progress

The challenge for measuring progress is that there is no agreed set of goals for sustainable development…

A clear definition of the sustainable development goals and related policy commitments is needed, in order to assess options for measuring and monitoring progress. At present, there is no agreement either on the definition of goals, targets and indicators, or on assessment metrics.

…but by using existing thematic assessments in key initial focus areas of the OWG-SDG we show how SDG progress could be monitored in the future.

There are thematic assessments for all the initial key focus areas discussed by the Open Working Group on Sustainable Development Goals (SDGs). The Global Sustainable Development Report could regularly bring together these and other assessments to monitor progress towards the achievement of the future SDGs. At the end of this Executive Summary we provide an overview of relevant assessments, past trends, agreed goals/commitments, and expected future trends.

There are three fundamentally different approaches to measuring overall progress toward sustainable development.

The first approach uses indicators and official data to measure progress against a number of internationally agreed commitments. Hence, whether a trend is being considered good progress depends primarily on the level of ambition in the original goal/target setting which is not necessarily rooted in scientific or objective criteria.

The second approach is based on aggregate indicators of sustainable development progress that have been suggested by analysts and scientists. This approach is also primarily based on official data. The aggregate indicators differ greatly in terms of their focus, reflecting the different perspectives and values of the individual analysts that created them.

The third approach is a variation on the first and the second approaches. It uses data intelligence and complements official data from surveys with highly spatially disaggregated non-official data from a variety of sources such as remote sensing, mobile phones, road traffic, and user-based crowdsourcing. The third approach uses data already available and can more easily and more quickly fill data gaps in the poorest regions, but it is technically most demanding.

There have been a large number of initiatives for measuring and monitoring progress with indicator sets or indices.

An impressive number of initiatives have recently been undertaken to devise and implement better measures of progress towards sustainable development. In this prototype report, we review them, including: the EU's beyond GDP initiative; the Measure of Economic Welfare (MEW), the Index of Sustainable Economic Welfare (ISEW), and the Genuine Progress Indicator (GPI); the World Bank's wealth estimates and adjusted net savings; the UN Commission for Sustainable Development indicators of sustainable development; the UN Statistical Commission's System of Environmental-Economic Accounting project (SEEA); the Joint UNECE/OECD/Eurostat Working Group on statistics for sustainable development-Task Force on measuring sustainable development; the OECD's Better Life Initiative: Measuring well-being and progress; and the UNDP Human Development Index and Human Sustainable Development Index. These initiatives use their own conceptual frameworks and sets of statistical measures. Most recently, Rio+20 called for a programme of work on broader measures of progress to complement GDP in order to better inform policy decisions.

The traditional ways of measuring sustainable development progress share a number of shortcomings, including high costs of official statistics and capacity constraints, low spatial resolution, low temporal frequency and no tracking of interactions between spatial and temporal scales.

Therefore, the "big data" approach - i.e. the use of remote sensing (satellite-based) and communication technologies - has great potential for assessing long-term sustainable development progress and to complement and improve official statistics.

There is need for capacity building to improve the availability and quality of data on sustainable development.

High quality and sustainably produced statistics are crucial both for setting targets and for monitoring progress. Measuring progress requires comprehensive monitoring and a robust accountability mechanism. Further investment in national statistical systems and capacity development may be needed for national data collection, data processing and analysis, and to capture high quality, further disaggregated data. The two agendas—on defining sustainable development goals and on progress measurement—are linked and if properly coordinated can lead to strengthened synergy and stronger overall progress. Indicators corresponding to the future SDGs are most important for monitoring future progress, but they will need to be complemented by composite indices of sustainable development progress.

A toolbox for monitoring sustainable development progress will need to be developed, in order to help decision makers.

7. Special theme: The climate-land-energy-water-development nexus (CLEWD)

National planning and assessment continue to follow almost exclusively sectoral lines…

A tendency to ignore inter-linkages among sectors and across national borders has meant that success in one area or location has too often come at the expense of increasing problems elsewhere. The links among food, fuel, and climate crises are a case in point. Energy, water and food security, land use issues, development policy, and climate policy continue to be addressed in isolation.

…even though they are strongly linked, especially in drought sensitive areas and in Small Island Developing States.

Water, energy and land are all needed to grow food. Some food crops can also be used as biofuel. Power plants require water. Energy-intensive seawater desalination increasingly provides water for drinking and agriculture. Water and energy infrastructure is needed to spur development and vice versa.

In many parts of the world, a changing climate exacerbates some of these already strained links.

For example, increasing droughts due to climate change call for increased energy inputs for irrigation and limit the use of hydro-power plants. In some SIDS, as well as in drought-sensitive areas, these impacts of a changing climate are already a reality.

A pioneering pilot assessment of the climate-land-energy-water-development nexus in Mauritius has shown the practical benefits of integrated analysis for policy making. The assessment of the climate-land-energy-water-development nexus has helped in identifying innovative policy that avoids costly mistakes of isolated sectoral policy making – e.g. suggesting in the Mauritian case wind-based power for water desalinization as a preferred investment to water-intensive biofuels expansion. This is a good example of a strong science-policy interface in action.

In a very short time, the Mauritius case study has inspired many similar climate-land-energy-water-development nexus applications. Our prototype report presents case studies in Australia, Brazil, Burkina Faso, Canada, Cuba, Chile, China, Germany, India, Jamaica, Lithuania, Mauritius, Qatar, South Africa, Syria, Thailand, USA, UK, Tarawa/Kiribati, Comoros, Madagascar, Seychelles, Zanzibar, California, and the river basins of the Danube and the Nile, as well as a number of local applications. These applications use different entry points – energy security, water security or food security – but they share the same approach.

Global CLEWD model indicates greenhouse gas mitigation costs turn out to be much less than currently suggested by sectoral models.

A global CLEWD model has been developed as an open-source, open-data support to emerging national and regional applications. Interestingly, when CLEWD inter-linkages are taken into account, greenhouse gas mitigation costs turn out to be much less than currently suggested by separate global energy models. When we are realistic about trade-offs between different resources under a changing climate, most of the cheaper sectoral baseline scenarios will not be feasible. Feasible baseline scenarios without climate mitigation policies will require higher investments, and integrated approaches that achieve a range of sustainable development goals may turn out to be cheaper than the feasible business-as-usual alternatives.

The CLEWD case studies illustrate the benefits of integrated approaches. In particular, they helped identify innovative and better solutions.

CLEWD results also provide important lessons for the ongoing discussions on the definition of SDGs. In fact they indicate a need to include clusters of strongly interlinked issues in the SDG discussions, beyond the sectoral and thematic approach.

Higher-level strategic CLEWD assessments might replace some of the lower-level project assessments.

Concerns have been voiced about an increasingly complex hierarchy of assessments, which is perceived as burdensome by some parts of many Governments and the private sector. In order to make scenario modelling relevant and sustainable at the same time, this problem must be acknowledged and some of the lower level (project) assessments might be replaced by fewer higher-level, strategic assessments.

The "right" cluster of themes for integrated policy is case specific. In the future, the Global Sustainable Development Report could look at other clusters deemed important by government policy makers.

The CLEWD nexus approach is a pragmatic approach to integrated assessment for selected clusters of strongly interlinked issues. It is not specific to the particular set of issues. It should be noted, however, that the "right" cluster of themes is case specific. In some cases, these clusters can be narrower (e.g., energy-water), in others they need to be wider (e.g., including biodiversity). Carrying out a CLEWD-type nexus assessment requires cooperation among different disciplines and various parts of government, with potentially important overall governance and economic benefits.

8. Selected science digests

A potential function of the Global Sustainable Development Report may be to provide digests of recent scientific findings to government officials who follow the UN sustainable development debate.

As an example, and to illustrate contributions young scientists could make to future editions of the Global Sustainable Development Report, the prototype report includes a short, adapted version of three digests related to oceans (i.e. ocean acidification, marine microbial ecology and bioreactors) and food security (i.e. protein substitutes and the livestock sector) that were provided by a group of young researchers and validated by science peers.

The potential value added of these digests is to shed light on specific aspects of broader themes highlighted in intergovernmental documents such as the Rio+20 outcome document, which often do not go too deep into detail.

Intergovernmental documents such as the Rio+20 outcome document are generally relatively broad and do not necessarily go into deep detail. Therefore, digests prepared by scientists on more technical issues can highlight both problems and possible scientific-technological solutions.

For instance, the digest on ocean acidification shows that since preindustrial times, there has been a 30% increase in ocean acidity. However, the speed and magnitude of the ocean acidification process adversely affects marine ecosystems and species and will affect various economic sectors such as fisheries, aquaculture and tourism, and consequently food security. Researchers have been making efforts to find measures to adapt to and mitigate ocean acidification but political and social feasibility of reducing CO_2 emissions raises concerns and therefore – depending on the viewpoint – feasibility can be considered relatively high or low.

The digest on marine microbial ecology and bioreactors outlines, *inter alia*, that more efficient research into microbial communities and their interactions with the environment can be attained through biodiversity assessments and that a better understanding of microbial ecology could help in many fields, from ecosystem resilience and restoration to a higher yield in seafood production.

Finally, on food security, a digest focusing on protein substitutes and the livestock sector highlights that livestock products are important elements of the human diet but their production has the highest negative impact on the environment and human health among all agricultural sectors. It notes that the demand for livestock products is on the rise and that its production has expanded steadily in the last half century in both developed and developing countries with a projection to double by 2050. Thus, it recommends, amongst other things, to increase availability and presence in the market of protein substitutes in human food and animal feed through the use of policy instruments, subsidies and research for their development, and to improve legislation and regulation regarding the safety and use of new proteins.

9. Issues for Consideration

Potential overall directions for the Global Sustainable Development Report

In the future, the Global Sustainable Development Report could provide scientific inputs for deliberations of the high-level political forum on sustainable development. The report could also contribute to agenda-setting of the forum and report on global progress in the achievement of the SDGs, once adopted in 2015. In addition, it could provide scientific evidence for linking global goals with means to achieve them. Ultimately, the report will help in improving the science-policy interface for sustainable development, as called for at Rio+20.

Conduct a regular assessment of assessments to identify common ground and different views

Decision-makers may want to task assessment processes, in the context of this assessment of assessments on sustainable development, not only to identify scientific consensus but equally to focus on describing differences in view, including from minority groups of scientists, extending beyond the dominant peer-reviewed academic journals. Identifying and describing different views could be built formally into the assessment process and form the basis for identifying areas for joint action.

Take into account various types of knowledge and many perspectives, especially those of scientists in developing countries including the poorest and most vulnerable countries…

This requires taking into account a wider range of social and natural sciences as well as sources of knowledge. It also requires going beyond the peer-reviewed literature and including local and traditional knowledge, including knowledge of practitioners. Eliciting the knowledge held by government officials and policy makers, and fostering closer interaction between the science and policy making communities from the beginning of assessment processes, would also support the function of strengthening the science-policy interface.

…and allow for a wide range of participation through multiple channels.

Tapping into the expertise of the whole UN system and a wide range of scientific communities will be important. In order to allow for participation by a wide range of scientists and stakeholders, multiple channels of input should be open, such as through crowd-sourcing using online and offline methods. Protocols for evaluating such non-conventional sources of scientific knowledge will be needed.

Use the full range of new technologies and approaches.

The full range of new technologies and methodologies might be employed not only to facilitate participation in scientific assessments but also possibly for monitoring progress. Examples include monitoring sustainable development progress from space (by combining remote sensing with other data) and employing multiple methodologies and approaches, for example, for aggregate measures of sustainable progress beyond GDP. Different methodologies can lead to rather different conclusions, as illustrated in the full report with the case of monitoring poverty trends.

Build a UN institutional platform for sustainable development models and scenarios to support the Global Sustainable Development Report.

The report argues for a major effort to draw on the wider range of global modelling capabilities, in order to assess various sets of sustainable development objectives and eventually the set of SDGs ultimately agreed by Member States, and explore pathways toward their achievement, including in terms of technology and financing needs. A UN institutional home, or platform, for SDG scenarios and global models could prove beneficial, especially if it is connected to the Global Sustainable Development Report. The report could look at other clusters of strongly-interlinked issues, in addition to the climate-land-energy-water-development nexus, which would benefit from an inter-agency capacity building initiative to support national planners.

This would provide a direct link between global and national policy, fostering joint action and mutual learning.

Member States, the UN system and many scientists already agree on many of the elements that define the scope and methodology of a Global Sustainable Development Report…

Responses by Member States and UN system entities to a questionnaire on the scope and methodology of a Global Sustainable Development Report, and lessons learned from the exploratory, multi-stakeholder process to produce the prototype report converge on many elements that should characterize a Global Sustainable Development Report. Those are summarized in table 3 and could be considered in the way forward.

Table 3: Common elements of majority agreement on scope and methodology of the report

Element	Agreement
Added value	Easy access for decision-makers to findings of many scientific assessments. Highlight synergies and trade-offs between policy actions in various settings.
Focus	Focus on implementation, obstacles to progress, good practises of integrated policy
Capacity needs	Joint UN effort to support developing countries' participation
Audience	Policy makers, senior government officials and wide range of stakeholders
Scope in terms of issue focus	Priority issues identified in the Rio process, including Agenda 21, the Rio+20 outcome, as well as other internationally agreed goals and commitments. Supports HLPF and implementation of future SDGs and post-2015 development agenda
Geographic scope	Global and five UN regions, with analysis for groups of countries in special situations
Time horizon	Medium- (10 years) to Long-term (20 to 50 years)
Global issues covered	HLPF agenda, Rio+20 outcome document, Agenda 21, future SDGs and post-2015 development agenda
New and emerging issues	Identification based on sound scientific evidence
Coordination of report process	UN task team coordinated by the HLPF Secretariat (DESA's Division for Sustainable Development) at the global level and Regional Commissions at the regional level
Type of content	Past and future trends; lessons-learnt; scientific findings indicating potential areas for policy action; opportunities and challenges for implementation
Periodicity	In-depth report every four years coinciding with HLPF sessions under the GA, and focused report contributions for the HLPF sessions under the auspices of ECOSOC
Normative or descriptive	Policy-relevant content and options, but not normative policy recommendations
Monitoring and accountability framework for SDGs/post-2015 development agenda	The report possibly to become one of several contributions to the framework. Details are to be decided after 2015
Scientific methods	Multidisciplinary, integrated approach in the spirit of sustainability science. Precise methods to be decided by scientists, but prototype report illustrates a useful basis on the methodological side for future editions
How to inform the work of the HLPF	To be integrated in and provide scientific evidence for the deliberations of the HLPF. The report to become one of several inputs

Based on these elements, three options regarding the scope and methodology of the Global Sustainable Development Report could be considered.

Reponses to the questionnaire and lessons learned from the multi-stakeholder process resulted in the identification of three options that could be considered for a future report.

Option 1: Conventional UN flagship publication model: This option follows the approach generally used for UN flagship publications. The report is drafted by UN staff who also select experts for ad-hoc contributions. Knowledge inputs comprise peer-reviewed literature and UN system expertise. The report is peer-reviewed internally and approved by senior UN management. Inputs from Member States and stakeholders are based on ad-hoc requests and based entirely on existing UN structures, including those of the Regional Commissions.

Option 2: Multi-stakeholder model linked to voluntary national processes: This option goes further in terms of involving stakeholders and linking to voluntary national reviews. The report would be drafted by a team of UN staff comprising all UN-ECESA Plus members, with contributions from scientists, government officials and stakeholders. The report would undergo an external, multi-stakeholder peer-review process and be approved by UN senior management and/or a multi-stakeholder advisory group. Advice would be provided by representatives of academia, major groups, UN system and other international organizations that could include for example: the chairs of major international assessment initiatives, research programmes and academies of sciences; representatives of major groups and young scientists; chairs of key UN groups; representatives of key UN reports and outlooks; and representatives of relevant non-UN organizations. UN Regional Commissions would be encouraged to hold regional consultations and prepare contributions to the Report. Existing national processes and/or voluntary national reviews under HLPF would become important partners.

Option 3: Intergovernmental Panel on Sustainable Development: This option follows an IPCC-style model in which member States nominate scientific experts to a writing team which drafts the report to be adopted by Member States. Cooperation agreements may be sought with existing assessment initiatives and lessons-learnt from IPCC reviews can be taken into account in the design of the Panel. In particular, there may be a need to compensate authors for their contributions, in order to avoid conflicts of interests.

These options are synthetized in table 4 below.

Table 4: Overview of differences between the three options

Element	Option 1: Conventional UN flagship publication model	Option 2: Multi-stakeholder model linked to voluntary national processes	Option 3: Intergovernmental Panel on Sustainable Development
Report drafted by	UN staff	Team of UN staff with contributions from scientists, government officials and stakeholders.	Scientists nominated by member States
Experts selected by	UN staff	UN staff, assessment initiatives, member States, major groups	Member States
Peer-review	Internal to UN system	External, multi-stakeholder peer review (open process) including UN system	Peer review by participating scientists and external academic reviewers
Report approved by	UN senior management	UN senior management and/or multi-stakeholder advisory group	Member States
Scope of scientific knowledge	Peer-reviewed literature and UN system knowledge	All kinds of knowledge	Peer-reviewed literature
Regional priority issues identified by	Regional consultations coordinated by Regional Commissions	Multi-stakeholder regional consultations coordinated by Regional Commissions	Scientists
National priority issues identified by	Responses by member States to UN questionnaires	Voluntary, national consultations coordinated by Member States and supported by UN capacity building	Scientists
How to organize national and regional contributions	Desk study conducted by UN staff and inputs through ad-hoc UN request for inputs. Based on existing structures	Based on existing structures using existing focal points or channels for nominations. Organized by interested Member States with capacity support from UN system	New, formal group of scientists nominated by member States
Choosing thematic focus of each edition	UN senior management	HLPF in consultation with scientists and stakeholders	HLPF
National sustainable development process	No direct link	Partly based on voluntary processes and reports	No direct link
Scientific advisory group or working group	UN internal with ad-hoc external contributions	Multi-stakeholder group, including representatives of academies of sciences, SAB, CDP, and of key int'l assessments	New group of scientists nominated by governments

Annex

Selected Areas for Action identified in the SD21 study					
Who? Where?	**Sustainable development (SD)as the overall objective**	**Visions for sustainable development**	**Goals and strategies**	**Action plans**	**Implementation**
Ideal overall aspiration	Agree that sustainable development is the over-arching paradigm, at national and internationallevels.	Many visions for sustainability coexist. Agree on what to develop and what to sustain. Agree on fair sharing rules for use of the global commons (e.g. open oceans, atmosphere).	Develop integrated strategies and strong institutions that can guide all actors towards global sustainability.	Sectoral action plans should be based on agreed integrated strategies.	Ensure coordination of implementation of sectoral strategies.
Global level / UN	Reconfirm sustainable development as the overarching goal. Agree on a desired level of intergenerational equity and on thresholds for global planetary limits that should not be trespassed.	Agree on, or reconfirm, a minimal set of things to be developed and sustained. Re-examine the roles of various groups of countries in an updated allocation of rights and responsibilities.	Agree on division of labour between the international system and the national level. The UN, international community could focus on: (1) managing global commons; (2) interface with Member States on international rules that affect global human impacts on the environment (trade, corporations, financial and capital flows, pollution); (3) mechanisms for ensuring that national commitments on issues of global interest "add up". Adopt a small, consistent set of Sustainable Development Goals (SDGs).	Coherent action plans for the implementation of agreed strategies and goals.	Agree on credible mechanisms for enforcement of commitments.
Political commitment	Actively engage to eliminate the duality in "sustainable" and "mainstream" institutions, at national and international level. Inscribe the maintenance and development of natural capital into the core mandates of ministries of finance, economy and development.	Empower lower levels of governments to act on their own and try new approaches to sustainability.	Governments at all levels should lead by example by putting public procurement rules and practices in line with their publicly advertised sustainability goals. Re-orient public investment (e.g. infrastructure, transports) in a direction that facilitates sustainable choices and behaviours.	Ensure maximal impact of public procurement on sustainability objectives.	Mobilize the political will to manage natural resources sustainably.
Institutions and Society	Integrate global environmental limits and related risks in rules, institutions, and decision-making at all levels. Increase the voice given to future generations in institutions at all levels.	Incorporate resilience of social systems and ecological systems in decision-making. Manage the global commons equitably and sustainably. Define ways in which conflicts between rules and institutions can be resolved in a way that is compatible with overarching sustainable development objectives. Design mechanisms that ensure that commitments from different groups and different levels on issues of global interest "add up".	Look for robust strategies instead of "efficient" strategies. Consider all relevant instruments at our disposal – from acting on values and tastes, to demand management, to production efficiency. Integrate sustainability thinking in educational curricula. Develop strong institutions. Use integrated approaches to evolve sectoral goals and strategies that are consistent with broader goals ("Nexus approaches"). Design systemic mechanisms to bring UN conventions into the debate.	Build flexibility into institutions so that their scopes and mandates can be readjusted periodically. Ensure consistency of sectoral development strategies with broader sustainability objectives.	Conducive rules and support for projects and initiatives.
Participation and civil society		Provide forums for discussion and decision-making among all parts of society to elicit long-term strategies that achieve strong buy-in. Re-introduce equity as a dimension of decision-making, as opposed to an add-on to economic choices.	Put participation at the heart of decision-making at all relevant levels.	Participation	Participation
Science	Improve the science-policy interface, including on global limits and tipping points.	Design an institutional framework that allows for monitoring of major sustainability areas and providing adequate feedback to decision-making on areas of global importance.	Design transparent, independent and participatory monitoring and evaluation systems that provide the needed information to re-adjust course as needed.	Increase priority and resources for measurement and evaluation of action plans, institutions and standards.	Reinforce monitoring and evaluation capacity.
Private sector			Improve the compatibility of the system of rules governing the private sector with SD objectives. Reassess roles for the public and private sectors in the economy. Commit to providing a level playing field for local, low-technology, and non-market solutions, in order to enable local knowledge, skills, and technologies	Improve regulatory systems for financial and capital markets and corporations. Ensure they do not discriminate against local, low-tech, or non-market solutions.	Investments and projects.

Source: adapted from UN (2012). Back to Our Common Future. Sustainable Development in the 21st century (SD21) project. Summary for policy makers, 2012.

Annex

Progress towards achievement of goals or commitments in the initial 19 focus areas. The list is purely indicative. It is drawn from the schedule of work for the General Assembly Open Working Group on SDGs, 2013-2014.

Key thematic areas identified by Member States	Selected international reports and assessments	General comments about the past trends and current status	Goals or Commitments	Time-frame of targets	Dynamics-as-usual (Trend) Pathway from 2010 to 2050	Potential future goals/ targets (from various sources)
1. Poverty eradication (MDGs)	UN *Millennium Development Goals Reports);* World Bank-IMF *Global Monitoring Reports*	The world poverty reduction target was reached five years ahead of schedule. The proportion of people living on less than $1.25 a day fell from 47% to 22% between in 1990 and 2010. In 2012, more than 1 billion people still lived in extreme poverty which was, however, 700 million fewer people than in 1990. Progress has been uneven among regions and within countries.	Eradicate poverty	Reduce extreme poverty by half by **2015**	Progress in poverty reduction is fast enough to compensate for the growing world population, but the same absolute number of poor people will stay roughly at the 2010 level (of almost 3 billion people living on <US$2 per day).	Eliminate poverty worldwide by 2030
2. Food security and sustainable agriculture (MDGs and beyond)	UN *Millennium Development Goals Reports;* World Bank-IMF *Global Monitoring Reports;* FAO *State of World Reports; the State of Food Insecurity Reports;* UNCCD *Reports*	The relative hunger reduction target (halving the percentage of people suffering from hunger by 2015) is within reach. The proportion of undernourished people in developing countries decreased from 23.2%in 1990-92 to 14.9% in 2010-2012. But one in eight people in the world today remain chronically undernourished today.	World free of hunger	Reduce hunger by half by **2015**	The number of people going hungry is reduced by 500 million people, still leaving 250 million with insufficient food intake (down from 800 million in 2010).	Halve the proportion of people who suffer from hunger by 2015, further halve it by 2030, and eradicate hunger by 2050
3. Water and sanitation (MDGs)	UN *Millennium Development Goals Reports;* World Bank-IMF *Global Monitoring Reports;* UN *World Water Development Report*	The MDG drinking water target was met five years ahead of the schedule despite significant population growth. The proportion of the global population using such sources reached 89% in 2010, up from 76% in 1990. Progress towards the sanitation target has been good, but not good enough to meet the MDG target.	Ensure access to safe drinking water and stop unsustainable exploitation of water resources	Reduce proportion of people without sustainable access to safe drinking water and basic sanitation by half by **2015**.	> 240 million people (mostly in rural areas) will be without access to improved water source, and 1.4 billion people without access to basic sanitation. Child mortality from diarrhoea (caused by unsafe water supply/poor sanitation) will decrease, but Sub-Saharan Africa will lag behind.	Universal access to improved water source and basic sanitation by 2050
4. Health (MDGs)	UN *Millennium Development Goals Reports;* World Bank-IMF *Global Monitoring Reports;* WHO *World Health Report*	Good progress has been made on child mortality, less on maternal mortality. Access to reproductive health services shows slow progress. Despite the progress made in MDG-related health, the coverage of health services and financial risk protection falls far short of universal coverage.	Reduce child mortality; improve maternal health; combat HIV/AIDs etc.	Reduce by two thirds, between 1990 and **2015**, the under-five mortality rate.	Global premature mortality from malaria halved to 0.4 million from 2010 to 2050.	Universal access to health care
5. Education (MDGs)	UN *Millennium Development Goals Reports*; World Bank-IMF *Global Monitoring Reports*	The number of children out of school declined by almost half between 2000 and 2011 but progress in reducing the number of children out of school has slowed. The world is unlikely to reach universal primary education by 2015.	Universal primary schooling	By **2015**, children everywhere(boys and girls alike) will be able to complete a full course of primary schooling	Universal primary education by 2020, universal secondary education by 2050. Women will account for the majority of higher-level degrees worldwide.	Universal primary education by 2020. Universal secondary education by 2030.
6. Employment (MDGs, JPOI)	ILO *Global Employment Trends* World Bank; *World Development Reports*	Global unemployment increased by another 4 million over the course of 2012. A quarter of the increase was in the high-income economies, three quarters in developing countries.	Full and productive employment and decent work for all.	**By 2015**, achieve full and productive employment and decent work for all. **By 2020**, increase decent employment for the urban poor.	1 billion new "livelihoods" to be created from 2010 to 2030 (BAU estimate).	Create 63 million decent *new* jobs per year until 2050, achieving full, productive and decent employment for all.
7. Oceans (Ch. 17 of Agenda 21; JPOI; Aichi Targets 6, 10 and 11; Target 7.B of MDG)	UNGA *Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-economic Aspects*; UNEP *Keeping Track Reports*	Oceans have become more acidic, which has impacted corals and marine life. Oceans have warmed and sea-levels risen. Today, 80% of global fisheries are either fully exploited or overexploited. Other challenges include marine pollution, invasive aquatic species, coastal area development, safety of navigation, maritime security, working conditions and impacts from resource extraction.	Protection of the oceans and all kinds of seas	By **2015**, the multiple anthropogenic pressures on coral reefs are minimized, so as to maintain their integrity and functioning	Global collapse of ocean fisheries before 2050.	Eliminate overfishing by 2025 and restore fish stocks.
8. Biodiversity (Aichi Targets; Target 7.B of MDGs)	CBD *Global Biodiversity Outlooks*	The target agreed by Governments in 2002, "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national levels …", has not been met. Biodiversity continues to decline in all three of its main	20 Aichi Goals of halting global biodiversity loss	Achieve, by **2010**, a significant reduction in the rate of biodiversity loss	Biodiversity (measured as terrestrial mean species abundance) will decline by 10% (highest losses in Asia, Europe, and Southern Africa). The area of natural land	Stabilize biodiversity at the 2020/2030 level (depending on region) by 2050

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Key thematic areas identified by Member States	Selected international reports and assessments	General comments about the past trends and current status	Goals or Commitments	Time-frame of targets	Dynamics-as-usual (Trend) Pathway from 2010 to 2050	Potential future goals/ targets (from various sources)
		components – genes, species and ecosystems. The target agreed by Governments in 2002, "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national levels …", has not been met. Biodiversity continues to decline in all three of its main components – genes, species and ecosystems.			converted to agriculture will decrease after 2030 ("peak farmland"), but biodiversity impacts will continue thereafter.	
9. Forest (Aichi Targets on forest; Four shared global objectives on forests at UNFF in 2006.)	UN Forest Forum Reports; CBD *Global Biodiversity Outlooks;* FAO *Global Forest Resources Assessments*	Today, forests cover 31% of the global land area and are a safety net for the poor. The rate of deforestation has decreased and large-scale planting of trees is significantly reducing the global net loss of forest area. Several countries in South America and Africa continue to have the large net losses of forest.	Forest component of Aichi targets: reducing deforestation	25% reduction in annual global deforestation and degradation rates by **2015** compared with the 2000-05 average	Primary forests will continue to disappear. The overall rate of global deforestation will decrease, leading to no net forest loss after 2020. Continued lack of understanding of the complex non-linear dynamics of ecosystems.	No net forest loss and no more destruction of primary forests by 2020
10. Sustainable consumption and production (SCP) (Ch.4 Agenda 21; and Ch. 3 of JPOI)	UN *Trends Reports: Towards Sustainable Consumption Production;* World Business Council for SD: *Vision 2050 Report*; UNEP: *The Marrakech Process Progress Report*	The 10YFP on sustainable consumption and production patterns was adopted at Rio+20 (§226). Progress has been made in greening production chains and in procurement policy. Global eco-efficiency has continuously improved while the absolute scale of material consumption has increased unabated.	Change unsustainable patterns of consumption and production	International plan of action is in place, but no time-bound target.	Doubling or tripling of total material consumption. Primary energy use will increase by 80%,water demand by 55% (mainly from manufacturing (+400%), electricity (+140%) and domestic use (+130%)). In the face of competing demands, there will be little scope for increasing irrigation. Global eco-efficiency will increase by a factor 1.5 to 2.	Stabilize global material consumption at 2015 levels. Increase global eco-efficiency by a factor of 3.2. (or 4) by 2050.
11. Means of implementation (MDGs, Rio+20; Copenhagen Accord)	UNCTAD *Trade and Investment Reports; MDG Gap Task Force Reports*; World Bank *World Development Reports*; IPCC Reports; WIPO *Annual Reports*	Progress has been made, but gaps remain in the implementation of global commitments in the areas of aid, trade, debt relief, and access to new technologies and affordable essential medicines. The financial, food and energy crises have reversed some of the earlier progress. The proportion of net ODA in donor's GNI increased from 2000 to 2010, but decreased thereafter to 0.29% in 2012, with the poorest countries being most adversely affected.	Develop a global partnership for development	Meet the 0.7% ODA/GNI target now; $100 billion per year for climate change by **2020**	Net ODA will remain at around 0.3% GNI of donors. Technology performance will continue to increase too slowly to compensate for increasing demand. Gaps in access to technology will hardly narrow, implying technology diffusion rates well below what would be needed to achieve even existing goals.	Achieve 0.7% ODA/GNI, focusing on the poorest and most vulnerable. Mobilize resources for a SDG fund commensurate with needs by 2018. Universal access to sustainable technology by 2030. Global technology performance im-provement by a factor 4 by 2050.
12. Sustained and inclusive economic growth (Rio+20)	UN DESA *World Economic and Social Survey;* UNIDO *Industrial Development Report*	Partly due to recent financial crisis, financing has fallen short in areas that are critical for sustainable growth: long-term investment, research and development, and investment in riskier sectors, such as SMEs.	Achieve sustainable development, promoting sustainable, inclusive and equitable economic growth	Sustained real economic growth in all countries.	Gross world product will quadrupleto US$300 trillion, with BRICS accounting for 40%. Within country, inequality will increase as will the gap between the poorest and richest countries.	GDP per capita > US$10,000 PPP in all countries by 2050. Sustained increase in Genuine Progress Indicator per capita.
13. Needs of countries in special situations, and middle-income countries (Istanbul Programme of Action; Rio+20)	SG's Report on Implementation of the Programme of Action for the LDCs; UN-OHRLLS *Reports on LDCs, LLDCs and SIDS*; ADB: *African Development Reports*	The economic growth performance of LDCs has improved considerably over the last decade, as did enrolment in primary education. The LLDCs and SIDS have made progress, but they are not on track to achieve many of the MDGs by 2015. The middle-income countries continue to face a range of development challenges, including an expectation to increase their role as development donors.	Address the special needs of Africa, LDCs, LLDCs and SIDSs.	Range of targets	Continued challenges faced by the poorest and most vulnerable countries.	Achieve graduation of all LDCs by 2050. Reduce the vulnerability of SIDS to the average of developing countries by 2030.

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Key thematic areas identified by Member States	Selected international reports and assessments	General comments about the past trends and current status	Goals or Commitments	Time-frame of targets	Dynamics-as-usual (Trend) Pathway from 2010 to 2050	Potential future goals/ targets (from various sources)
14. Human rights, the right to development and global governance (Rio+20)	UNDP *Human Development Reports;* World Bank *World Development Reports*	Differences in rights and basic opportunities across nationality, race, gender, and social groups have persisted.	Respect, protect and promote human rights and fundamen-tal freedom for all	Range of targets	Human rights regime may face additional pressure due to conflicts arising from global competition for natural resources	Implement existing human rights commitments
15. Equality (MDGs)	*Human Development Reports;* UN-Women *Progress of the World's Women;* UN *Millennium Development Goals Reports*	There has been progress on some of the MDGs with rapid gains in education, and poverty reductions and child mortality. However, world inequality, by some measures, is high and rising within and among countries. Gains from growth are unequally distributed.	Promote gender equality and empower women	Equal girl's enrolment in primary school; women's share of paid employment etc. by **2015**	Rising world middle-income class. GDP per capita increases from US$33,000 to 69,000 in OECD, from US$7500 to 37,000 in BRICS, US$11,100 to 33,000 globally.	GDP per capita > US$10,000 PPP in all regions by 2050. Sustained increase in intergenerational earnings, wage and educational mobility.
16. Energy (Rio+20 Outcome Document)	*Global Tracking Framework Report;* IIASA *Global Energy Assessment;* IEA *World Energy Outlooks;* IPCC Working Group III Reports	Today, 2.4 billion people have no access to modern energy services. It continues to be difficult to reconcile this necessity and demand for energy with its impact on the natural resource base in order to ensure that sustainable development goals are realized.	Make sustainable energy for all a reality	(Informal) sustainable energy for all targets	Primary energy use increases by 80%. Mix remains fairly stable: fossil fuels (85%), modern renewable sources (10%), nuclear (5%). Energy intensity improvements outstripped by energy demand.	Universal access to modern energy services by 2030. Double the global rate of improvement in energy efficiency. Double the share of renewable energy in the global energy mix.
17. Sustainable cities, transport. (MDGs and beyond)	UN-HABITAT: *Global Reports on Human Settlement*; IEA: *World Energy Outlook* – BLUE Shift	In the past 12 years alone, cities for 770 million people (equivalent to 93 New York cities) have been built, more than in any decade before. Urbanization increased from 29% in 1950 to surpass 50% in 2007. Demand for freight and passenger transport has grown 1.5 to 2 times faster than GDP since the early 1990s. In Asia and he Pacific region alone, transport investment requirements are $292 billion per year, up from $137 billion in the early 1990s.	Improve the lives of slum-dwellers	Achieve, by **2020**, a significant improvement in the lives of at least 100 million slum dwellers	Urbanization reaches 70% (+2.8 billion people in urban areas, -0.6 billion in rural areas). Transport will continue to grow considerably faster than GDP and reach levels 5-10.	Reduce the number of slum dwellers to close to 0 by 2050.
18. Climate Change and Disaster Risk Reduction (Copenhagen Accord)	*IPCC Assessment Reports;* UNFCCC Independent Reports; UNEP: *Emission Gap Reports;* World Bank: *Turn Down the Heat Reports;* UNISDR *Global Assessment Reports* *IPCC Assessment Reports;* UNFCCC Independent Reports; UNEP: *Emission Gap Reports;* World Bank: *Turn Down the Heat Reports;* UNISDR *Global Assessment Reports*	Since 1850, global use of fossil fuels has increased to domestic energy supply, leading to a rapid growth in greenhouse gas emissions. Greenhouse gas emissions have increased at an accelerated rate in the 2010s. By 2012, CO2 concentration had surpassed 400 ppm (39% above pre-industrial levels). Lower-income countries are disproportionally affected by disaster risk.	Hold global mean temperature increase below 2°C	By **2050** or longer term based on scientific evidence	Atmospheric GHG concentrations reach 685 ppmv (CO2-equ.), (eventually leading to 3-6 degree Celsius warming).	Keep atmospheric GHG concentration below 450 ppm CO2-eq. from 2010 to 2100.
19. Conflict prevention, post-conflict peace-building	*Human Security Report*	The global level of fragility declined worldwide by some 20 percent between 1995 and 2010 according to the State Fragility Index. The deadliness of warfare has declined over the last 50 to 60 years, and there are now significantly fewer armed conflicts around the world than during the peak of the early 1990s. The average number of high-intensity conflicts per year dropped by half from the 1980s to the new millennium.	Maintain international peace and security – UN Charter	Maintain international peace and security	Continued, significant number of State-based armed conflicts. Continued reduction in the number of deaths from non-State armed conflicts. Possibly more frequent and ever more intense conflicts in the long run.	Ensure international peace and security

[1] Details were provided in the revised programme budget endorsed by the General Assembly at the end of 2012.
[2] EC-ESA (Executive Committee for Economic and Social Affairs) Plus membership can be found here: http://www.un.org/en/development/other/ecesa.shtml
[3] Available at: http://sustainabledevelopment.un.org/index.php?menu=1621
[4] See the report here: http://sustainabledevelopment.un.org/index.php?menu=1621
[5] Riahi, K., et al. (2012), *Energy Pathways for Sustainable Development* (Chapter 17). In: Global energy assessment. Cambridge University Press. & McCollum, D., and Riahi, K., (2012). T*o Rio and Beyond: Sustainable Energy Scenarios for the 21st Century*. IIASA, April 2012. (based on GEA scenario chapter)
[6] PBL (2012), Van Vuuren, D., Kok, M. (eds.) (2012). *Roads from Rio+20: Pathways to achieve global sustainability goals by 2050*. PBL Netherlands Environmental Assessment Agency, with contributions by the Overseas Development Institute, UK, and the Agricultural Economics Research Institute, Netherlands, ISBN 978-94-91506-00-0, June 2012.
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[8] OECD (2012), *Environment Outlook for 2050: the consequences of inaction*, OECD, June 2012, ISBN 978-92-64-12224-6; and
Chateau, J., Rebolledo, C., Dellink, R., (2011), *An Economic Projection to 2050: The OECD 'ENV-LINKAGES' Model Baseline'*, OECD Environment Working Papers, No. 41, OECD Publishing.
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[11] Raskin, P., et al. (2010), *The Century Ahead: Searching for Sustainability. Sustainability,* Vol. 2, pp. 2626-2651.
Note: This is an update of Global Scenario Group's work.
[12] UN DESA (2013), *Financial needs for sustainable development*, Division for Sustainable Development's inputs to the UN Task Team on post-2015 agenda.