CONTENTS

12	CUTI		

25 1. INTRODUCTION

- **25** 1.1. Context
- 25 1.2. Prototype United Nations report
- 1.3. Participation and consultations
- 1.4. Objective and scope
- 1.5. Outline

31 2. ASSESSMENTS FOR SUSTAINABLE DEVELOPMENT

- 31 2.1. Introduction
- 2.2. International assessments
- 37 2.3. National assessments
- 41 2.4. Designing assessment processes to link knowledge with action
- 42 2.5. Emerging issues identified by science

44 3. REVIEW OF PROGRESS

- 44 3.1. Sustainable development trends and progress
- 3.2. Reflection on synergies and trade-offs
- 3.3. Progress in terms of commitments on sustainable development
- 3.4. Perspectives: Making sense of the debate on sustainable development progress

62 4. VISIONS, SCENARIOS AND FUTURE PATHWAYS TOWARDS SUSTAINABLE DEVELOPMENT

- 4.1. If we continue like in the past: a "dynamics-as-usual" scenario 2010-2050
- 4.2. A better world we can achieve: a sustainable development scenario
- 4.3. The most likely world in 2050? A prediction for the world in 2052
- 4.4. Note on global scenarios at the science–policy interface
- 4.5. Investment and technology needs and market potentials

73 5. MEASURING PROGRESS

- 5.1. Measuring progress towards internationally agreed commitmets
- 5.2. Global initiatives on measuring overall progress
- 5.3. Monitoring development from space and beyond: filling data gaps in the poorest countries with "big data" approaches

5.4. The way forward

93 6. SPECIAL THEME: THE CLIMATE-LAND-ENERGY-WATER-DEVELOPMENT NEXUS

- 6.1. From integrated assessment to the climate-landenergy-water-development nexus
- 6.2. Interlinked issues: climate, land/food, energy, water, materials and development
- 6.3. Hierarchy of assessments
- 6.4. Global climate-land-energy-water-development nexus (CLEWD) model an open source, open-data approach
- **6.5.** Landscape of CLEWD nexus applications: subnational, national, regional and cross-border river basins
- 103 6.6. Conclusion

104 7. SELECTED SCIENCE DIGESTS

- 104 7.1. Ocean acidification
- 7.2. Marine microbial ecology and bioreactors
- 7.3. Protein substitutes and the livestock sector

108 8. ISSUES FOR CONSIDERATION

- 8.1. Lessons learned from the preparation of the present prototype report
- 8.2. Selected issues
- 8.3. Options for scope and methodology of a Global Sustainable Development Report

112 ANNEX

- Annex 1: Outcomes and/or summaries of selected
- Annex 2: List of United Nations/international organizations publications and outlooks
- Annex 3: Information on selected assessments
- Annex 4: Note on data sources, statistical methods and uncertainty
- Annex 5: Global CLEWS model an open source, open-data approach
- Annex 6: Response to the questionnaire on the scope and methodology of a global sustainable development report
- Annex 7: Selected areas for action identified in the SD21

140 NOTES

FIGURES

- Figure 1. From people to nature
- **Figure 2.** Three dimensions of sustainable development in the capital approach
- **Figure 3.** Geographic distribution of sustainability science publications.
- **Figure 4.** Number of articles (contained in Google Scholar) indicating selected ultimate objectives
- **Figure 5.** United Nations Member States that submitted national sustainable development reports in preparation for Rio+20
- **44 Figure 6.** From people to nature
- **Figure 7.** World population aged 15 years and above by level of educational attainment in 1970-2010
- **Figure 8.** Global foreign exchange market reserves in trillion US\$, 1995-2013
- **Figure 9.** Global household wealth, 2000-2013
- **Figure 10.** Regional distribution of global household wealth
- **Figure 11.** International and global income inequality
- **Figure 12.** Changes in real income between 1988 and 2008 at various percentiles of the global income distribution.
- **Figure 13.** Global CO₂ emissions from fossil-fuel burning, cement manufacture and gas flaring (billion metric tons)
- **Figure 14.** Human appropriation of net primary productivity excluding human fires
- **Figure 15.** Orders of magnitude of investment requirements for various sectors from the literature (US\$ billion)
- **Figure 16.** Global trends in GPI and other aggregate metrics of progress, 1961-2007
- **Figure 17.** The world's gross savings vs adjusted net savings, 1970-2008
- **Figure 18.** Income growth, estimated by official sources and by using night-time lights data, 1992/3 to 2005/6
- Figure 19. Temporal and spatial resolution of data sources
- **Figure 20.** World map of night-time light data
- **Figure 21.** Lao People's Democratic Republic at night, 1992 and 2010
- Figure 22. Land cover data for the Lao People's Democratic Republic. 2001 and 2010
- Figure 23. Estimation of economic growth at the subnational level for agriculture and non-agricultural sectors growth in Thailand, Myanmar, Cambodia, Lao PDR and Vietnam

- Figure 24. Net primary production 2012 in the Greater Mekong Subregion
- **Figure 25.** MODIS EVI for the Mekong river delta in 2010, 2011 and 2012
- **Figure 26.** Google prediction (blue) vs official data (orange) of influenza cases in the US
- **Figure 27.** Use of cell-phone data in Kenya to show movements of people (A) and carrying of malaria parasites by humans (B)
- **Figure 28.** Priority areas for SDGs officially suggested by Governments in December 2012
- **Figure 29.** Mauritius CLEW interlinkages considered in the case study
- **Figure 30.** Predicted impact of climate change on water availability in Mauritius, water-related energy consumption and GHG emissions, predictions for year 2030
- **Figure 31.** Changed energy balance due to reduced landuse change in Burkina Faso in 2020
- **Figure 32.** Qatar case study of the water–energy–food
- Figure 33. Conceptual design of the GLUCOSE model
- Figure 34. Simplified reference energy system of the GLUCOSE model
- **Figure 35.** Reference land resource system of the GLUCOSE model
- **Figure 36.** Reference resource system for the materials module of the GLUCOSE model
- **Figure 37.** Total Primary Energy Supply in the baseline scenario of the separate energy module (left) and the integrated GLUCOSE model (right)
- **Figure 38.** Water consumption in the materials sector in the baseline scenario
- **Figure 39.** Water consumption in the energy sector, excluding hydropower
- **Figure 40.** Power generation in the baseline (left) and CO_2 tax (right) scenarios
- Figure 41. Total primary energy supply in the GLUCOSE model for the 4°C (left) and 2°C scenario (right)
- **Figure 42.** Emission constraints and actual emissions in selected scenarios

TABLES

- **Table 1.** Sustainable development bringing together great global issues at the United Nations
- **Table 2.** Areas and issues typically covered in definitions of "sustainable development" in the literature
- **Table 3.** Coverage of three pillars of sustainable development
- **Table 4.** Comparing reviews with assessments
- **Table 5.** Top 15 assessments scientists worldwide would like to bring to the attention of decision-makers
- **Table 6.** Simple typology of international sustainable development assessments
- **Table 7.** Example of messages of United Nations systems publications on food, biofuels and land compared with integrated solutions
- **Table 8.** Summary of national sustainable development documents, by region
- **Table 9.** List of topics, cross-sectoral issues, and themes maintained by the United Nations Division for Sustainable Development
- Table 10. Top-15 sustainable development issues scientists worldwide would like decision-makers to consider for action
- **Table 11.** Top-10 global risks identified by a stakeholder survey of the World Economic Forum
- **Table 12.** Issues identified by young researchers
- **Table 13.** Top-10 emerging environmental issues identified by UNEP
- **Table 14.** Overview of global sustainable development trends
- **Table 15.** Global number of people, in billions, 1950-2012
- Table 16. Global macroeconomic data
- **Table 17.** Households size versus electricity and natural gas use
- **Table 18.** Interlinkages between trends and sustainable development issues at the global level. 1950-2013
- **Table 19.** Progress towards achievement of goals or commitments in the initial 19 focus areas of the United Nations Open Working Group on Sustainable Development Goals
- **Table 20.** Top-15 crowdsourced answers to the question: "What do you think the world will be like in 2050?"
- **Table 21.** Brief characterization of the consequences of continuing like in the past (a "dynamics-as-usual" scenario 2010-2050)

- **Table 22** Top-15 crowdsourced ideas on "What kind of world would you like to see for yourself, your children and grandchildren in 2050?"
- **Table 23.** Goals and targets in sustainable development scenarios for Rio+20
- **Table 24.** Progress towards internationally agreed commitments and potential future goals in the areas on the agenda of the Open Working Group on Sustainable Development Goals
- **Table 25.** Broad overview of perspectives, scope, dimensions and purpose of selected global initiatives to measure overall progress
- 79 Table 26. Calculation of the measure of economic welfare
- **Table 27.** Calculation of GPI (as used for Baltimore city)
- **Table 28.** Calculation of adjusted net savings
- **Table 29.** United Nations Commission for Sustainable Development sustainable development indicators
- **Table 30.** System of Environmental-Economic Accounting classification of environmental activities
- **Table 31.** "Small set" of indicators proposed by UNECE, Eurostat and OECD in 2009
- **Table 32.** "Small set" of indicators proposed by UNECE/ Eurostat/OECD task force on measuring sustainable development in 2013
- **Table 33.** Components of OECD's Better Life Index
- **Table 34.** Components of the human development index and human sustainable development index
- **Table 35.** Big data examples which can be useful to monitor the priority areas for SDGs
- Table 36. Selected climate-land-energy-waterdevelopment nexus content in national submissions in preparation for Rio+20
- **Table 37.** Selected interlinkages between climate, land/ food, energy, water and materials
- **Table 38.** Stylized review of integrated assessment practices
- **Table 39.** Coverage of CLEWD issues in selected national case studies
- **Table 40.** Tools and models used in the selected CLEWD case studies
- **Table 41.** Selected national and subnational CLEWD applications (ongoing or recently completed)
- **Table 42.** Regional CLEWD case studies and river basins (ongoing or recently completed)

BOXES

- **Table 43**. Proposals for basins to be assessed (water-food-energy-ecosystems nexus) under the UNECE Water Convention
- Table 44. Overview of science digests provided for this report by young scientists at Wageningen University
- **Table 45**. Common elements of majority agreement on scope and methodology of the Global Sustainable Development Report
- **Table 46.** Overview of differences between the three options
- **Table 47**. Key assessments carried out under the Convention on Biological Diversity (CBD)
- Table 48. Production steps of UNEP's GEO-5 report
- **Table 49**. Data sources of estimates of total, global investment needs (chapter 4.5)
- **Table 50.** Data sources for GPI components, United States (chapter 5.2)
- **Table 51.** List of data sources for chapter 3
- **Table 52**. Coverage of selected aggregated measures
- Table 53. Land categories in the land module of the GLUCOSE model

- **Box 1.** United Nations entities that have supported the production of a prototype global sustainable development report
- **Box 2.** Expert group meetings in support of a global sustainable development report
- **Box 3.** Strategic environmental assessment and Poverty Reduction Strategy Papers
- **Box 4.** Lessons learned from strategic environmental
- **Box 5.** Ten principles for organizing science advice, suggested by New Zealand's Chief Science Adviser
- **Box 6.** SDG criteria agreed by Member States in the Rio+20 outcome document
- **Box 7.** Potential sustainable development goals/targets that have been suggested by scientists
- **Box 8.** Integrated Sustainability Assessment