Measuring Progress:

Towards Achieving the Environmental Dimension of the SDGs

First published by the United Nations Environment Programme in 2019

ISBN: 978-807-3750-9
Job Number: DEW/2236/NA

Layout and printing: UNON Publishing Services Section – ISO 14001-certified

Table of Contents

Acronyms

ABSCH	Access and Benefit-sharing Clearing-House
ADB	Asian Development Bank
AfDB	African Development Bank
AMCEN	African Ministerial Conference for Environment
ASEAN	Association of Southeast Asian Nations
BCCIC	British Columbia Council for International Cooperation
BRIC	Brazil, Russia, India, China
CBD	Secretariat of the Convention on Biological Diversity
CIF	Climate Investment Funds
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DMC	Domestic material consumption
EST	Environmentally sound technologies
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic product
GEO	Global Environmental Outlook
GLAAS	UN-Water Global Analysis and Assessment of Sanitation and Drinking–Water
IEA	International Energy Agency
ILAC	Latin American and Caribbean Initiative for Sustainable Development
ILO	International Labour Organization
IOC	Intergovernmental Oceanographic Commission
IRENA	International Renewable Energy Agency
IRP	International Resource Panel
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resource Management
LDCs	Least Developed Countries
LME	Large marine ecosystem
MDGs	Millennium Development Goals
MEAs	Multilateral environmental agreements
NAP	National adaptation plan
NDC	Nationally determined contribution
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
pH	Average marine acidity
PM	Particulate matter
REDD	Reduce greenhouse gas emissions from deforestation and forest degradation
SCP	Sustainable consumption and production
SDG	Sustainable Development Goal
TEEB	The Economics of Ecosystems and Biodiversity
UN Energy	United Nations' inter-agency Mechanism on Energy
UNCCD	United Nations Convention to Combat Desertification
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDAF	United Nations Development Assistant Framework
UN-DOALOS	United Nations Division for Ocean Affairs and the Law of the Sea
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO-IHP	United Nations Educational, Scientific and Cultural Organization International Hydrological Programme
UNESCO-UIS	United Nations Educational, Scientific and Cultural Organization Institute of Statistics
UN-ESCWA	United Nations Economic and Social Commission for Western Asia
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNISDR	United Nations Office for Disaster Reduction
UNODC	United Nations Office on Drugs and Crime
UNSD	United Nations Statistics Division
UNWTO	World Tourism Organization
USD	United States dollar
VNR	Voluntary national review
WASH	water, santiation and hygiene
WHO	World Health Organization

Acknowledgements

Lead author and methodological development – Jillian Campbell, Science Division, UNEP

UN Environment publication support Team – Immaculate Katunge Mwololo, Science Division, UNEP (graphics); Rachel Kosse, Science Division, UNEP (editing and coordination); Dany Ghafari, Science Division, UNEP and Sera Kinoyan, Science Division, UNEP (data processing); Franklin Odhiambo, Science Division, UNEP (peer review process coordinator); and Angela Kim, Science Division, UNEP (editing)

UN Environment overall coordination – Jillian Campbell, Pierre Boileau, Brennan VanDyke, and Ludgarde Coppens of the Science Division of UNEP under the leadership and guidance of Jian Liu, Director of the Science Division

Contributing Authors: Regional Analysis
The following people contributed to the regional analysis for this publication (alphabetical by region)

Africa – Jean-Jacob Sahou, Africa Office, UNEP and Charles Sebukeera, Africa Office, UNEP

Asia and the Pacific – Silvia Giada Asia and Pacific Office, UNEP; Jonathan Gilman Asia and Pacific Office, UNEP; Young Ran Hur Asia and Pacific Office, UNEP; Janet Salem Asia and Pacific Office, UNEP; Kakuko Nagatani-Yoshida Asia and Pacific Office, UNEP and Jinhua Zhang Asia and Pacific Office, UNEP

Europe – Matthew Billot Europe Office, UNEP and Tomas Marques Europe Office, UNEP

Latin America and the Caribbean – Francesco Gaetani Latin America and Caribbean Office, UNEP and Piedad Martin Latin America and Caribbean Office, UNEP

North America – Jason Jabbour North America Office, UNEP and Emilia Suarez Executive Office, UNEP

West Asia – Abdul-Majeid Haddad West Asia Office, UNEP and Abdelmenam Mohamed West Asia Office, UNEP

Contributing authors: Thematic analysis
The following people contributed to the thematic analysis of the SDG indicators Contributing authors on thematic analysis:

Joy Aeree Kim, Economy Division, UNEP (SDG 12.c.1); Sasha Alexander, External Relations and Policy Advocacy Unit, UNCCD (SDG 15.3.1); Hilary Allison, UNEP-WCMC (SDG 15.5.1); Maria Jose Baptista, Economy Division, UNEP (SDG 8.4.1/12.2.1, 8.4.2/12.2.2); Sam Barratt, Ecosystems Division, UNEP (SDG 4.7.1, 12.8.1, 12.a.1, 13.3.1); Donatien Beguy, Research and Capacity Development Branch, UN-Habitat (SDG 11.3.1); Lis Mullin Bernhardt, Ecosystems Division, UNEP (SDG 6.4.2, 6.5.2, 6.6.1, 6.a.1, 6.b.1); Peter Bjornsen, Ecosystems Division UNEP (SDG 6.5.1); Laure Boissat, Ecosystems Division, UNEP (SDG 15.6.1, 15.9.1, 15.a.1, 15.b.1); Oliver Brown, Policy and Programme Division, UNEP (SDG 1.5.1/11.5.1/13.1.1, 1.5.2/11.5.2, 1.5.3/11.b.2/13.1.2, 1.5.4/11.b.1/13.1.3); Kilian Christ, Science Division, UNEP (SDG 3.9.2, 6.1.1, 6.3.2) ; John M. Christensen, UNEP DTU Partnership, Technical University of Denmark(SDG 7.a.1); Ludgarde Coppens, Science Division, UNEP (SDG 9.4.1, 13.2.1, 13.3.2, 13.a.1, 13.b.1, 16.8.1); Yannis Derbali, Law Division, UNEP (SDG 17.14.1); Kristof Doucot, Environment Division, UNECE (Text box on PRTR); Francoise D'Estais, Economy Division, UNEP (SDG 7.b.1); Birguy Lamizana Diallo, Ecosystems Division, UNEP (SDG 6.3.1); Pablo Fuentenebro, Ecosystems Division, UNEP (SDG 4.7.1, 12.8.1, 12.a.1, 13.3.1); Dany Ghafari, Science Division, UNEP (SDG 11.2.1); Paul Glennie, DHI Centre on Water and Environment, UNEP (SDG 6.5.1); Salman Hussain Economy Division, UNEP (SDG 15.6.1, 15.9.1, 15.a.1, 15.b.1); Peder Jensen, Economy Division, UNEP (SDG 8.4.1/12.2.1, 8.4.2/12.2.2); Maarten Kappelle, Science Division, UNEP (SDG 17.6.1); Paul Kellett, Economy Division, UNEP (SDG 7.3.1, 7.b.1); Sean Khan, Science Division, UNEP (SDG 3.9.1, 11.6.2); Hartwig Kremer, Science Division, UNEP (SDG 3.9.2, 6.1.1, 6.3.2) Edward Lewis, UNEP-WCMC (SDG 14.5.1, 15.1.2, 15.4.1); James Lomax, Economy Division, UNEP (SDG 12.3.1); Verozian Mang'eli, Ecosystems Division, UNEP (SDG 6.4.2, 6.5.2, 6.6.1, 6.a.1, 6.b.1); Maria Socorro Manguiat, Law Division, UNEP (SDG 15.7.1, 15.c.1); David Marquis, Science Division, UNEP (SDG 11.6.1, 12.4.2, 12.5.1, 14.1.1, 14.3.1, 14.6.1); Liana Talaue McManus, Project Coordination Unit, GRID-Arendal(SDG 14.2.1, 14.4.1, 14.7.1, 14.a.1); Eduardo Moreno, Science Division, UNEP (SDG 11.3.1); Gerald Mutisya, Ozone Secretariat, UNEP (SDG 12.4.1); Dennis Mwaniki, Research and Capacity Development Branch, UN-Habitat (SDG 11.3.1); Robert Ndugwa, Research and Capacity Development Branch, UN-Habitat(SDG 11.3.1); Diana Ngina, Science

Division, UNEP (SDG 8.9.2, 11.c.1, 12.b.1, 15.3.1, 15.4.2, 15.8.1, 17.9.1); Carolin Sanz Noriega, Environment Division, UNECE (Text box on PRTR); Lara Ognibene, Law Division, UNEP (SDG 14.c.1); Abraham Pedroza, Economy Division, UNEP (SDG 12.6.1); Fabienne Pierre, Economy Division, UNEP (SDG 12.1.1); Mark Radka, Economy Division, UNEP (SDG 7.1.2, 7.2.1, 7.3.1, 7.a.1, 7.b.1); Lowri Angharad Rees, Science Division, UNEP (SDG 12.3.1, 12.6.1, 17.7.1); Cecilia Lopez Y Royo Di Taurisano, Economy Division, UNEP (SDG 12.1.1); Elisa Tonda, Economy Division, UNEP (SDG 12.6.1); Sara Trærup, UNEP DTU Partnership, Technical University of Denmark (SDG 7.a.1); Victor Tsang, Policy and Programme Division, UNEP (SDG 15.1.1, 15.2.1); Kaisa Uusimaa Science Division, UNEP (SDG 3.9.2, 6.1.1, 6.3.2); Juliette Kohler Voinov, Ozone Secretariat, UNEP (SDG 12.4.1); Laura E. Williamson, Economy Division, UNEP (SDG 7.1.2, 7.2.1); and Farid Yaker, Economy Division, UNEP (SDG 12.7.1).

Jillian Campbell also contributed to the text on the indicators and drafted the text for all indicators not mentioned above.

Reviewers:

David Jensen, Policy and Programme Division, UNEP; Lowri Angharad Rees, Science Division, UNEP; Steven Ramage, Group on Earth Observations (GEO) Secretariat; Hilary Allison, UNEP-WCMC; Melvin Alvarez, Executive Office, UNEP; Jason Jabbour, North America Office, UNEP; Carla Friedrich, North America Office, UNEP; Sasha Alexander, External Relations and Policy Advocacy Unit, UNCCD; Hilary French, North America Office, UNEP; Chazhong Ge, Chinese Academy for Environmental Planning; Elisabeth Bernhardt, Ecosystems Division, UNEP; Maria Jose Baptista, Economy Division, UNEP; Annukka Lipponen, Environment Division, UNECE; Dr MP Sukumaran Nair, Centre for Green Technology and Management; Tessa Goverse, Economy Division, UNEP; Charlotte Salpin, Office of Legal Affairs, UN-DOALOS; Thais Linhares-Juvenal, Food and Agricultural Organization, UN; Anssi Pekkarinen, Food and Agriculture Organization, UN; Poh Poh Wong, University of Adelaide; Francesco Mattion, International Energy Agency; Heather Adair-Rohani, World Health Organization; Sophie Gumy, World Health Organization; Victor Tsang, Policy and Programme Division, UNEP; Riccardo Zennaro, Ecosystems Division, UNEP; Marco Rieckmann, University of Vechta; Bernard Combes, Education for Sustainable Development Division, UNESCO; Carolin Sanz Noriega, Environment Division, UNECE; Manzoor Qadir, United Nations University Institute for Water, Environment and Health; Ludgarde Coppens, Science Division, UNEP; Andrew Hudson, UNDP; Dr. Pandi Zdruli, International Centre for Advanced Mediterranean Agronomic Studies; Paul Lucas, PBL Netherlands Environmental Assessment Agency; Liana McManus, Project Coordination Unit, GRID-Arendal; Dorian Kalamvrezos Navarro, Food and Agriculture Organization, UN; and Tatiana Terekhova, Ozone Secretariat, UNEP.

Introduction

The Sustainable Development Goals (SDGs), the Multilateral Environment Agreements (MEAs) and other information related to the environmental drivers, state, pressures, impacts and responses underpin the methodology of the Global Environmental Outlook (GEO) process. Additionally, the GEO captures linkages with socio-economic development which are useful for better contextualizing the environment and for understanding the nexus between the environment, people and the economy. The GEO also provides a summary of recommendations and policy implications based on the assessment.

Measuring Progress is a derivative product of the sixth report in the GEO series (GEO-6; UNEP 2019a). This publication complements the GEO and provides an overview of the current state of the environmental dimensions of sustainable development based on the SDG indicators - including the availability of statistical and spatial data, analytical methods and visualisations - and identifies knowledge and information gaps in terms of assessing progress towards the environmental dimension of the SDGs.

The Sustainable Development Goals targets and indicators

The SDGs provide a framework which elaborates the global development agenda towards achieving a better and more sustainable future for all. The 17 SDGs and 169 targets are integrated and indivisible and balance the three dimensions of sustainable development: economic, social and environmental. The SDGs are a call for action by all countries – poor, rich and middle-income – in areas of critical importance for humanity and the planet: People, Planet, Prosperity, Peace and Partnership. A monitoring framework of 244 indicators has been agreed on for monitoring the SDGs. This global SDG indicator framework provides information on the most pressing global issues identified by countries; however, it does not represent a complete list of all information that is needed to understand the overall health of the planet, specific national challenges, or the interlinkages between the environmental dimension of development and the social and economic dimensions of development.

The phrase, *the environmental dimension of the SDGs,* does not have a precise definition and there are many different views on what the environmental dimension of development should include (e.g. should it include only those indicators related to the state of the environment or should it also include indicators related to access to natural resources such as water and indicators related to interactions between environmental indicators and the attainment of other social and economic indicators?). For this analysis, the environmental dimension of the SDGs includes the list of 93 SDGs indicators which was presented by the United Nations Environment Programme (UN Environment) Secretariat to the UN Environment Assembly Committee of Permanent Representatives at the sub-committee meeting on 20 September 2018 (United Nations Environment Programme [UNEP] 2018a) (see Annex 1). During the construction of this report, reviewers suggested other SDG indicators are important for the environmental dimension of the 2030 agenda, but currently the report is developed around this list of 93 indicators.

The official SDGs indicators are used as the basis for the analysis in this publication (United Nations, General Assembly [UNGA] 2017a). For indicators where no data are available, other data or information were used to summarise the state of progress for that indicator. The SDGs indicators have been classified into three Tiers by the UN Inter-Agency and Expert Group on the SDG indicators in order to summarise globally the level of data availability and methodological development. The three Tiers are defined as: “Tier 1: Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 percent of countries and of the population in every region where the indicator is relevant. Tier 2: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries. Tier 3: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested” (UN 2018a). In this publication, the Tier categorisation is summarised in Annex 1 and included in the Thematic Analysis section for reference.

Overview of the methods used for this report

The data in the Statistical Annex and in this report is based on data included in the Environment Live Global Database (UNEP 2019b). The Environment Live Global Database was established as a resource for supporting global assessments on the environment, including the Sixth Global Environment Outlook (GEO6) process. For the official SDGs indicators, the data in the Environment Live Global Database is an exact match with the data in the Global SDG Indicators Database; however, the Environment Live Global Database includes additional indicators and SDG disaggregations which are not in the Global SDG Indicators Database. This database underpins much of the analysis in the GEO6 and it includes more than 1,000 indicators related to the environmental dimension of the SDGs, MEAs, other

environment-related information and socio-economic information needed to help contextualise the analysis. The database is part of the Environment Live platform. The data come from a variety of international databases and other sources, UN Environment maintains strict criteria for the information in the Environment Live Global Database which include: (1) data must be published by a UN agency or a UN partner operating at the global level; (2) data must have publicly available, transparent methodologies and metadata which describe how the data are compiled and quality assurance processes; (3) data must be compiled at the global level (i.e. data which are only available for a single country or region is not included); (4) time series data must include more than two data points; and (5) the most recent point in the time series must be no more than 10 years old. The Environment Live Global Database also uses a statistical methodology for aggregating national data to produce global, regional, sub-regional and special country groupings (UNEP 2019c).

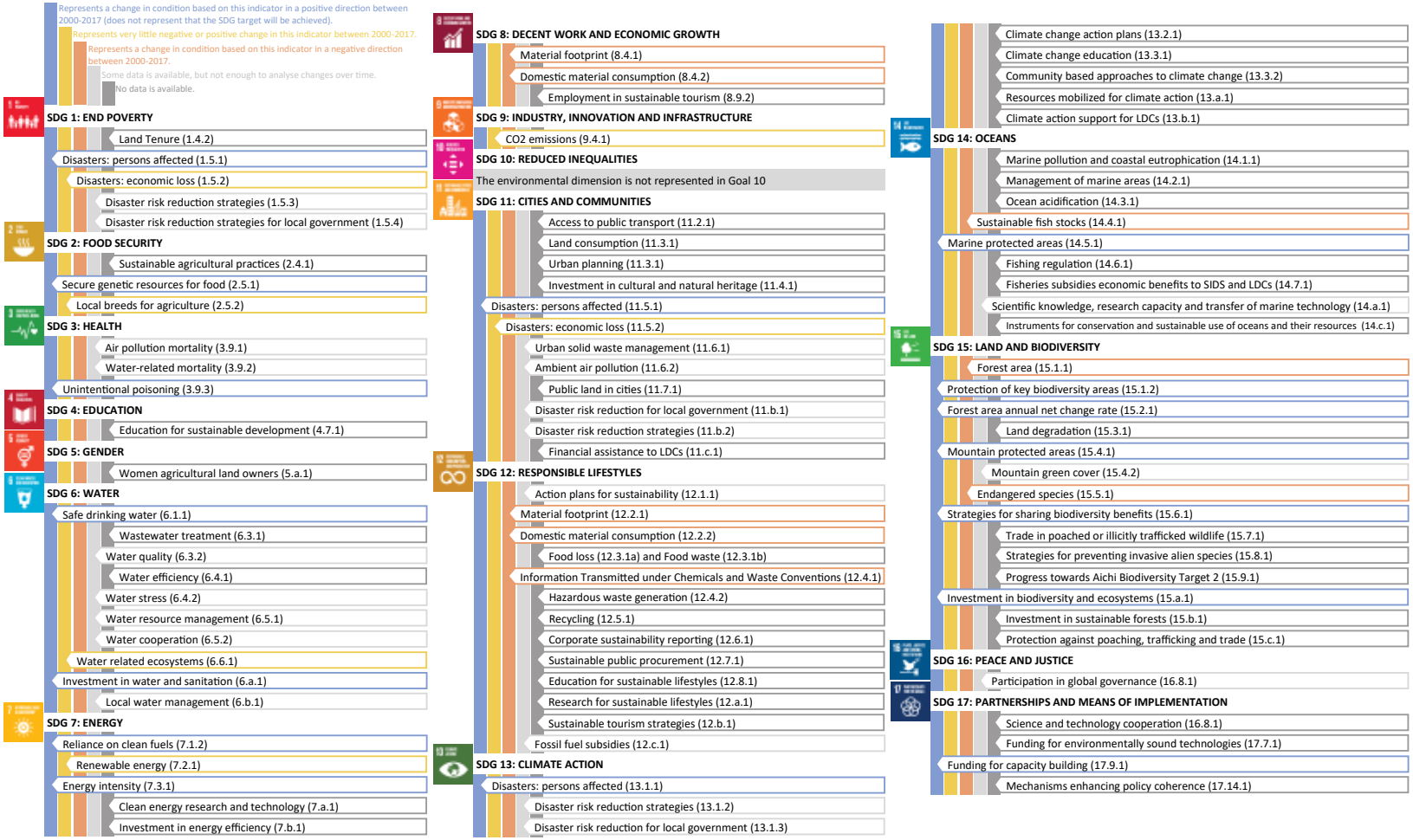
For this publication, simple extrapolation procedures were used to estimate if the SDGs targets at the global and regional level would be met based on the current state of the SDGs indicators (i.e. no efforts to change the current data trend). A simple extrapolation method was chosen due to the fact that this method is easy to employ and duplicate. There are many other methods of forecasting progress which would take into account policy actions which are already underway as well as known threats or challenges; however, these methods would be highly difficult to apply and to duplicate over the entire set of 93 indicators presented in this report. The results of the extrapolation are displayed in the Scorecard in Figure 3. Thus, the rate of progress at the regional and global level for the next 15 years was estimated to be identical to the rate of progress in the last 15 years at a global level. The data were extrapolated using the exponential regression model based on available data points from year to year. The cut-off used for data extrapolation and analysis is the year 2030. The projected 2030 data and the indicator target were compared to determine if each target will be met.

An indicator is considered to have no data, if there is not enough data for global aggregation. The global aggregation mode was followed to determine if there was enough data for global aggregation (UNEP 2019c). Where sufficient data are available, aggregations are performed for all indicators which share a common unit and are believed to be internationally comparable. An indicator is considered to have too little data if there is only one time point available and thus it is not possible to assess progress. Note that for this report, the official SDGs indicators were used. For some of the indicators, proxy information does exist, but as these data are not recognised for monitoring the SDGs, they were not used in the scorecard analysis.

A list of data sources and definitions of all indicators used in the scorecards is included in Annex 3.

This publication includes regional and thematic level analysis of the environmental dimension of the SDGs.

Figure 3. Global Scorecard on the environmental dimension of the SDGs based on extrapolation of data to 2030



Overview of SDGs Progress

Of the 93 environment-related SDGs indicators, there are 20 (22 per cent) for which good progress has been made over the last 15 years. If this progress continues, it is likely that these SDGs targets will be met. However, for the other 78 per cent of the environment-related SDGs indicators, there is either not sufficient data to assess progress (62 per cent) or it is unlikely that the target will be met without upscaling action (16 per cent).

Many of the indicators for which good progress has been made reflect a mix of policy changes, improved reporting, and increased funding efforts. For example, there has been an increase in terrestrial, mountain and marine protected areas; there has been an increase in the effort to combat invasive species; there has been significant progress towards renewable energy; there has been an increase in sustainability reporting and mainstreaming in policy; and there has been an increase in development assistance for climate change and the environment.

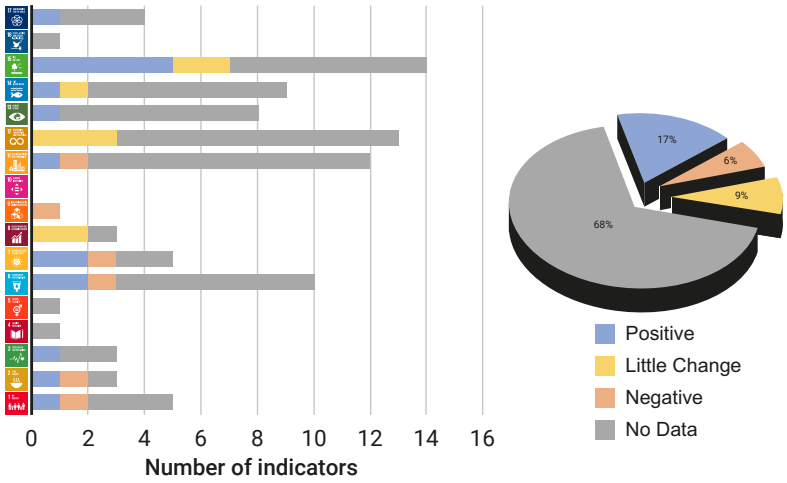
For eight of the environment-related SDGs indicators progress has been relatively flat and for seven of the SDGs indicators additional emphasis will be needed. In particular, many of the indicators related to the state of the environment show a negative trend (e.g., indicators related to forests, sustainable fisheries, endangered species, domestic material consumption, and material footprint).

Unfortunately, this is still a very incomplete picture as there is too little data to formally assess the status of 58 of the 93 environment-related SDGs indicators (62 per cent). Many of the indicators without available data correspond with issues that have not received sufficient attention in terms of SDGs implementation and thus additional action on these areas is particularly important.

Analysis

There has been progress in terms of putting in place policy, financial, and institutional processes in support of achieving the environmental dimension of development. Progress has been made on all 11 environment-related SDGs indicators related to policy, financial and institutional processes with available data. Specifically, there have been significant efforts to improve policy, financial, and institutional mechanisms related to the environment, on investment in water and sanitation (SDG target 6.a), financial assistance to least developed countries (SDG target 11.c), action plans for sustainability (SDG target 12.1), marine and terrestrial protected areas (SDG targets 14.5, 15.1 and 15.2), sustainable forest

Figure 1. SDG Tree



management (SDG target 15.2), strategies for sharing biodiversity benefits (SDG target 15.6), investment in biodiversity and ecosystems and forests (SDG target 15.a and 15.b), and funding for capacity building (SDG target 17.9). Although there is not sufficient data on the other SDGs indicators related to policy, financial, and institutional mechanisms, there have been a number of global actions in many of these areas. Examples include improving integrated water resource management (SDG target 6.5), disaster risk reduction and climate change action plans (SDG targets 1.5., 11.b, 1, 13.1 and 13.2), and funding and investment for the environment (SDG targets 6.a, 7.b, 11. and 13.a). However, much of the work related to these interventions has only recently started and thus it is difficult to estimate the impact that these efforts will have on environmental outcomes. Additionally, there is a time lag between the initiation of a policy, financial, or institutional mechanism for development and the point at which that mechanism has an impact. The exact time lag is difficult to estimate and thus it is likewise difficult to estimate the potential success of the efforts on these SDGs targets towards achieving broader objectives related to the environmental dimension of development.

There has been mixed progress in improving access to environmental resources and reducing the impacts of environmental degradation on human health and food security. There have been gains related to providing more equitable access to environmental resources, such as water (SDG target 6.1) and energy (SDG

target 7.1). There have been mixed gains in terms of reducing the impacts of environmental degradation, climate change, and disasters on people (SDG targets 1.5, 11.5 and 13.1). In terms of the environment-related mortality (SDG target 3.9), improvements in health care systems have resulted in reductions in mortality caused by air pollution, water-borne disease, and unintentional poisoning in much of the world; however, there are still gaps in many parts of the world.

There is either no data or no progress towards all 12 of the SDGs targets related to the state of the environment. There is very little data that can be used to assess biodiversity, ecosystem health, the concentration of pollution and waste in the environment, and other environmental threats with only five of these SDGs targets having available data. However, based on the information that is available, many of the planet's resources and ecosystems are at risk. For the indicators with available data, there is a negative trend in terms of sustainable fish stocks (SDG target 14.4), forest area (SDG 15.1) and endangered species (SDG target 15.5), and mixed implementation for protecting water-related ecosystems (SDG target 6.6) and air pollution (SDG target 11.6). For the indicators without enough data to assess the trend at the global level, it is likely that there is a negative trend in terms of the state of the environment due to the fact that these areas are still receiving less attention in terms of policy interventions and investment in monitoring. This includes the indicators related to land degradation and land use (SDG target 15.3 and 11.3); coastal eutrophication, marine litter and ocean acidification (SDG targets 14.1 and 14.3); water quality and water stress (SDG target 6.3 and SDG target 6.4); and mountains (SDG target 15.4).

Efficient use of natural resources towards achieving sustainable consumption and production (SCP) remains a global challenge. Despite efforts to decouple economic growth from the exploitation of environmental resources, material footprint and domestic material consumption (SDG targets 8.4 and 12.2) at the global level continue to rise. Domestic material consumption and material footprint (SDG target 12.2) are key indicators in terms of SCP as these two indicators relate to the extraction of material from the environment, including biomass, fossil fuels, metals and non-metallic minerals. There has been mixed progress in terms of reducing CO_2 emissions from infrastructure (SDG target 9.4), reducing fossil fuels subsidies (SDG target 12.c), and promoting renewable energy (SDG target 7.2). While energy intensity (SDG target 7.3) has declined, growing populations translate into a need for greater energy efficiency. Although there is not enough data for many of the indicators related to SCP, there are global initiatives related to sustainable public procurement (SDG target 12.7), promoting sustainable agriculture (SDG target 2.4), and promoting sustainable tourism (SDG target 8.9 and 12.b); however, there remain challenges in terms of achieving sustainability for these targets. There is not enough data to assess progress on water efficiency (SDG target 6.4), management and generation of waste and hazardous waste (SDG targets 11.6 and 12.4), food waste (SDG target 12.3), recycling (SDG target 12.5), corporate sustainability reporting (12.6), and research and promotion of sustainable lifestyles (SDG targets 4.7, 7.a, 12.8, 12.a, 13.3, 14.a, 17.6 and 17.7). Many of these aspects of development have received little attention and, without additional focus, it is unlikely that these targets will be achieved. Additionally, as some of these targets have a 2020 timeframe, it is unlikely that they will be met.

While sex disaggregation is available in a number of environment-related SDGs indicators concerning people, information on the gender-environment nexus remains largely limited. Currently, gender-disaggregated data are available for a few indicators. UN Environment has published a framework for measuring the nexus between gender and the environment which identified four key information gaps along with guidance towards better filling those gaps. These include measuring the gender dimension of the "right to land, natural resources and biodiversity; access to food, energy, water and sanitation; climate change, sustainable production and consumption, and health and well-being; and women in environmental decision making at all levels" (UNEP 2019d).

People and the economy are two key determinants for indicators that can be expressed in terms of per capita (i.e. per person), proportion of population, and per unit of gross domestic product (GDP). The two resource indicators for material footprint and domestic material consumption (SDG targets 8.4 and 12.2) provide a good example as both can be expressed as per capita and per unit of GDP. It is important to consider changes in population size and economy when interpreting progress in these indicators. The same principle applies to indicators expressed as a proportion of people, such as mortality rates from polluted air and water (SDG target 3.9).

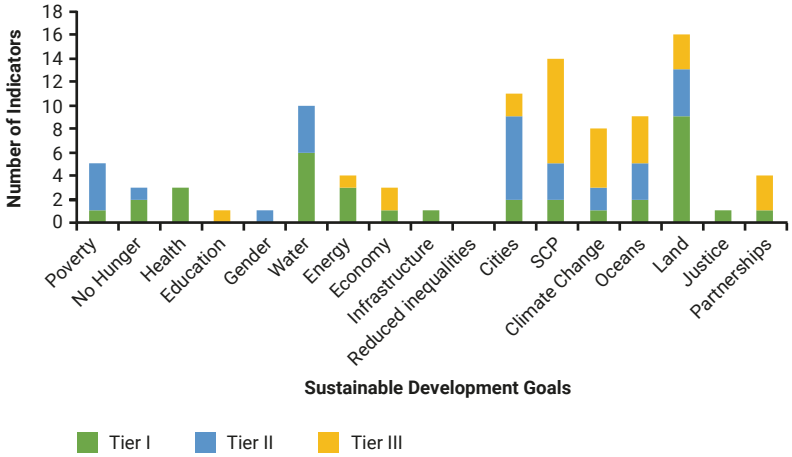
Data and statistics for measuring the environmental dimension of development remains a substantial constraint. Currently, there is only enough information available to assess global progress for less than 40 per cent of the environment-related SDGs indicators. Some of the constraints in monitoring the environmental dimension of development include limitations in national capacity in environmental statistics, deficiency in agreed methodologies for monitoring the environmental dimension of development, and challenges in data integration. Additionally, some data which are available nationally are not reported partially due to a reporting

burden on countries as countries receive many requests for data from different global entities.

There is insufficient information available for geospatial analysis and, without geospatial data, it is impossible to understand the challenges facing ecosystems or the relationships between the environment and people. Based on an initial list of SDGs indicators for which geospatial data would be required (United Nations Initiative on Global Geospatial Information Management [UN-GGIM] 2017), there are 17 environment-related SDGs indicators which could be underpinned by geospatial data. These include land tenure and ownership (SDG indicator 1.4.2 and 5.a.1), sustainable agriculture (SDG indicator 2.4.1), water quality (6.3.2), water cooperation (SDG indicator 6.5.2), water-related ecosystems (SDG indicator 6.6.1), access to public transportation (SDG target 11.2.1), land consumption (SDG indicator 11.3.1), public land in cities (SDG indicator 11.7.1), coastal eutrophication and marine litter (SDG indicator 14.1)[1], management of marine areas (SDG indicator 14.2.1), marine and terrestrial protected areas (SDG indicators 14.5.1, 15.1.2 and 15.4.1), forest area (SDG indicator 15.1.1), land degradation (SDG indicator 15.3.1), and mountain green cover (SDG indicator 15.4.2). Additionally, geospatial data are important for indicators related to the impact of climate change and disasters on people (SDG indicators 1.5.1, 11.5.1 and 13.1.1). Although geospatial data are being used by some countries and stakeholders to compile the SDGs indicators mentioned above, there is no central location where existing geospatial data for the SDGs indicators can be accessed and analysed.

More than 30 per cent of the environment-related SDGs indicators still do not have an agreed methodology (Figure 2). Robust methodologies underpin the production of statistics and indicators which are consistent across location and time. However, many environmental indicators still lack agreed terminology or a methodology. In terms of methodological development, a major challenge is developing methodologies which provide high quality information without requiring a prohibitive amount of financial resources. In this regard, there is a need to better use new sources of data and to integrate data coming from surveys and censuses, in situ monitoring with citizen science, transactional data, remote sensing data, data generated by social media, and other forms of new data (UNEP 2019a). The use of new data sources will also require technological innovation and a transformation in how data are analysed.

Figure 2. Environment-related SDGs indicators by Tier



Note: Tier I: A methodology exists and data are available for more than half of countries; Tier II: A methodology exists, but data are available for less than half of countries; Tier III: No methodology.

1 Note that coastal eutrophication and marine litter (SDG indicator 14.1) are not included in the Working Group on Geospatial Information list. However, UN Environment, as the custodian, considers geospatial data essential for these indicators.

Recommendations

Actions to reduce pollution, improve resource efficiency and better protect the environment must be scaled up in order to achieve the SDGs and ensure the long-term sustainability of the planet. The analysis in this report supports the GEO6 findings that the world is currently off track in terms of achieving the environmental dimension of development (UNEP 2019a), which in turn reduces people's wellbeing and undermines the achievement of the socio-economic goals.

In order to achieve the environmental dimension of sustainable development, there is a need to scale up support for environmental monitoring and analysis. In particular, governments and the private sector should assess ways to leverage frontier technologies and data sources that can improve spatial and temporal coverage while reducing acquisition costs. These include open data cubes, open source software, open algorithms, etc.

There is an urgent need to prioritise the development of SDGs indicator methodologies, including an elaboration on the need for disaggregated and geospatial information. Accurate information on the environment can be used to build public awareness on environmental issues; help policy makers make evidence-based decisions related to environmental management, provide a basis for progress transparency and assessing the effectiveness of actions and interventions; hold public and private sector stakeholders accountable for their actions; and anticipate future environmental challenges. Without methodologies, data and statistics cannot be produced and it is likely that policy interventions will be less effective, policy interactions will not be understood, and certain areas of the environment and the SDGs more broadly will not receive the resources required. The use of proxies for measuring thematic areas where there is little or no data may also provide value while methodological development is ongoing.

There is a need to invest in national statistical systems and build national capacity for monitoring the environment. Most of the data needed to understand the environmental dimension of development must be generated at the national level and thus there is an urgent need to build the capacity of countries to produce and use geospatial data, environmental statistics, and indicators. This includes improving the implementation of international standards (e.g. Framework for the Development of Environment Statistics and the System of Environmental Economic Accounting), building capacity related to specific SDGs indicators and improving geospatial information systems, in situ monitoring and observation programmes, and data management. In the absence of official national data, UN agencies and partners can help to aggregate and analyse best available data from a range of international sources.

There is a need to promote integrated analysis of the environment and of policy interactions, including reducing data fragmentation and supporting data sharing in accordance with national e-government and open data frameworks. At the national level, data are often not shared across Ministries and thus it is difficult to holistically analyse the environment and the interactions between the environment, the economy, and the people. This lack of data sharing is also prevalent at the regional and global levels. The lack of a single-entry point for accessing environmental data and information creates a barrier for technical experts and scientists working to analyse environmental issues. This also translates to a lack of information on the interactions between the implementation of specific SDGs targets (International Council for Science [ICSU] 2017). There is evidence of both negative and positive interactions between the SDGs indicators (Weitz *et al.* 2018); however, for the environmental dimension of development, there is a need for further research and analysis of these interactions.

Regional, sub-regional, and country-level mechanisms should be used to improve SDG follow-up, review and implementation. Implementation of the SDGs should be based on the local context and situation. Regional, sub-regional and national mechanisms are already in place which can support regional review, the formation of regional agreements, and capacity building efforts.

Goal 12 on Sustainable Consumption and Production (SCP) is key to the attainment of the other Goals, yet it remains the Goal with the least data availability, least funding (Dalberg 2017), and appears to be awarded low priority from Member States in their Voluntary National Reviews and SDG prioritisation processes. Efforts towards the achievement of the targets on SCP should therefore be upscaled. The transition towards sustainable and resilient societies will ultimately depend upon the responsible management of the planet's finite natural resources. Progress in economic and social development over the past century has led to environmental degradation and has endangered the very systems that provide the basis for future development.

Fresh water, in sufficient quantity and quality, is essential for all aspects of life and sustainable development. Water resources are embedded in all forms of development (e.g. food security, health promotion and poverty reduction); in sustaining economic growth in agriculture, industry, and energy generation; and in maintaining healthy ecosystems. While progress was made in improving drinking water and sanitation access under the Millennium Development Goals (MDGs), significant gaps remain. The water sector is struggling to improve water resources management and to increase the coverage and quality of water and sanitation services. Some of the many challenges are practical actions in “visible” side of water, such as financing for installing taps and toilets, building reservoirs, drilling boreholes, and treating and reusing/recycling wastewater. However, there remain challenges around the need for good water governance, which is crucial for implementing Integrated Water Resource Management (IWRM) (SDG indicator 6.5.1), resolving the challenges of sharing water and the benefits it provides across national boundaries, and tackling the thorny issue of inequality where the rich have better water services than the poor (e.g. wealthy landowners control water, reducing the productivity of smallholders).

Pollutant Release and Transfer Registers (PRTRs) have a strong potential to facilitate the implementation of the recommendations in this report.

(a) PRTRs help the industry and other relevant stakeholders to promote "actions to reduce pollution" and share pollution prevention methods;

(b) Today there exist many regional and national PRTR databases that can be used to improve the review of SDGs implementation related to pollution releases and to analyse the respective trends;

(c) PRTRs are well established tools for monitoring pollutant releases to the environment. Furthermore, they can be easily adapted to specific needs for monitoring and analysis of spatial and temporal data. There is a need to call for joint efforts to promote the establishment of PRTRs in countries and regions that currently do not have PRTR systems established;

(d) The Kyiv Protocol on PRTRs requires that aggregated and disaggregated geospatial information be made available in an integrated way with other related databases (these can be databases that provide data on economic, health, air/water quality, or urban planning related issues). PRTRs are promoted by international organizations as a tool that facilitates informed decisions;

(e) With additional reporting on resource consumption and pollutant releases from products, PRTRs are ideal tools for integrated analysis of the environment and policy interactions. Specifically, the effect of a change in policy related to pollution releases can be analysed and adaptive measures taken as necessary; Parties to the Kyiv Protocol have taken steps, notably though the Protocol’s Strategic Plan 2015-2020 and the Budva and Maastricht Declarations, to promote such use of PRTR systems.

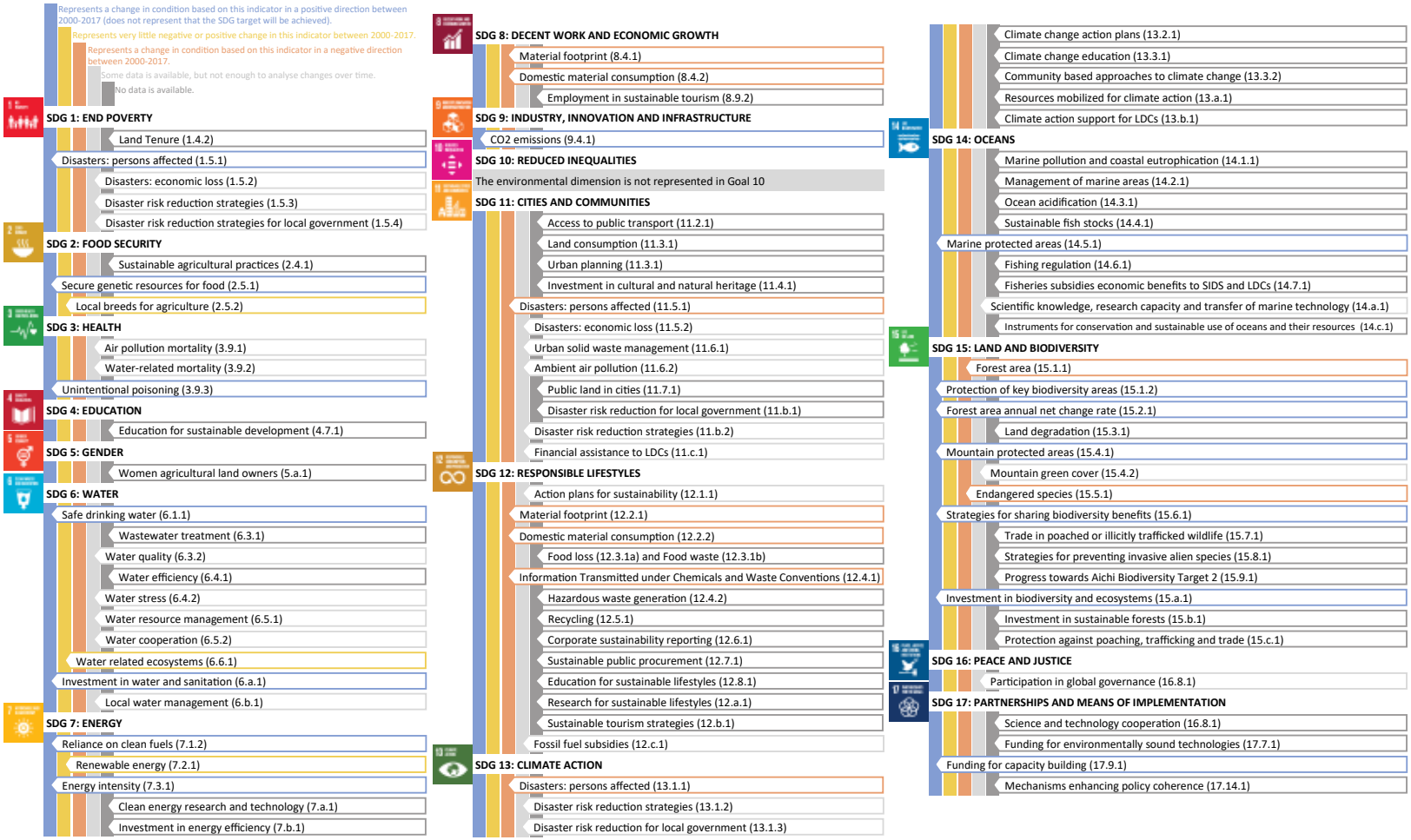
Regional analysis

The regional analysis was based on the SDGs regional groupings, except for North America and Europe, which have been separated.

A full description of the SDG regions, including the countries in each, is included in Annex 2. In summary, the description of Sub-Saharan Africa includes the SDGs region for Sub-Saharan Africa; the description for Asia and the Pacific includes the SDGs regions of Central and Southern Asia, East and South-East Asia and Oceania; the description of Europe is based on the European component of the SDGs region of Europe and North America; the description of Latin America and the Caribbean is based on the SDGs region of Latin America and the Caribbean; the description of North America is based on the North American component of the SDGs region of Europe and North America; and the description of West Asia includes the SDGs region North Africa and West Asia.

Sub-Saharan Africa

Sub-Saharan Africa



Introduction

Africa faces substantial challenges in achieving the SDGs. The biggest challenges are health (SDG 3), infrastructure (SDG 9), and peace, justice and strong institutions (SDG 16), with more than 80 per cent of countries facing significant gaps in achieving these goals, according to the 2018 Africa SDG Dashboard (The Sustainable Development Goals Center for Africa [SDGC/A] and Sustainable Development Solutions Network [SDSN] 2018). A review of the 2016-2017 UN Development Assistant Frameworks (UNDAFs) has revealed that most of the progress towards the SDGs is linked to the goals that were also included in the MDGs, including the SDGs on poverty (SDG 1), food security (SDG2), health (SDG 3), education (SDG 4) and gender equality (SDG 5). On the other hand, a delay in implementation is visible in the new thematic areas which correspond to the environmental dimension of development, notably the SDGs on water (SDG 6), energy (SDG 7), infrastructure (SDG 9), sustainable cities (SDG 11), sustainable consumption and production (SDG 12), climate change (SDG 13), oceans (SDG 14), and life on land (SDG 15).

This means that policy actions need to focus on those SDGs for the protection of the planet and its people and to ensure the linkages with the other SDGs in order to achieve sustainable development at the national level. Although progress is not on track for much of the environmental dimension of the SDGs, there have been some significant achievements over the last few years, including: the effort of the African Ministerial Conference for Environment (AMCEN) to increase advocacy and political awareness of the need to integrate Environmental Sustainability into development policies and strategies; a political dialogue bringing African ministers of health and environment to agree on a 10-year strategic plan to increase investment and accelerate health-environment priorities; the African Union priority setting through its 2063 Agenda supporting African countries to speed SDGs domestication and implementation; the UN System as a whole supporting countries through the UNDAF processes to ensure that the joint UN and Member States effort enhances institutional capacity development towards sustainable development; the Sustainable Development Center for Africa and the Sustainable Development Solution Network partnership to enhance knowledge, advocacy and institutional capacity across the continent to speed SDGs implementation; and countries' agreement, through UN Environment Resolution 2/5 (United Nations Environment Assembly of the United Nations Environment Programme [UNEA] 2016), to increase their engagement towards achieving the environmental dimension of the Agenda 2030.

Statistical availability and capacity

According to the 2017 Africa Sustainable Development Report (African Union [AU] 2017), approximately six out of every ten SDGs indicators cannot be tracked in Africa due to severe data limitations. There are deficiencies in statistical information that hamper Africa's development and transformation processes to achieve SDGs. Among other challenges, there is a lack of regular credible surveys to capture changes; there is inadequate funding and limited autonomy of the national statistical offices to generate accurate, credible, timely and neutral data; there is poor data quality with countries' efforts not making it possible to achieve anticipated improvements. These limitations lead to persistent data gaps in key development indicators, mainly in social, environmental, and governance indicators. The data gaps impede the establishment of baselines for measuring progress on development frameworks, including the SDGs and compound the challenge relating to monitoring the targets. Ultimately, this means that policy-making in the region is not informed by adequate data, nor the effect of policies adequately monitored.

Although some progress had been made in statistical development, this progress is uneven, and the national statistical systems still face a number of challenges, including building sustainable statistical systems as opposed to building temporary capacity when project funding is available. A few key actions

Medical clinic in Sub-Saharan Africa (USAID 2006).

underway to build capacity include the enhancement of capacity of national bodies in charge of statistics on environmental data generation and utilisation in support to UNDAF implementation; capacity development of national environment information network focal points; capacity development of national Environmental Protection Agencies to produce strategic information to inform national planning processes, such as the National Environment Summaries; and the publication of various Atlases and Outlook reports using data visualisation and near-real time special information. However, additional work is needed to build capacity which would allow for more detailed national analysis and comparison across the 54 heterogeneous countries that make up the Sub-Saharan Africa region.

Progress and gaps

Although there is a lack of data to assess the progress on many of the indicators, there have been significant actions taken towards a number of SDGs targets. There has been progress in promoting sustainable agriculture (SDG targets 1.4 and 2.4) and enhancing policy coherence (SDG target 17.14). This includes promoting integrated policy development, plans, and coordination mechanisms across the poverty-environment nexus and the institutionalisation of cross-sectoral budget and expenditure processes in many countries. For SDG 7, there has been progress on renewable energy (indicator 7.3.1) and clean fuel (indicator 7.1.2). An Africa Geothermal Centre of Excellence is being initiated in Kenya to strengthen capacities of women and youths to use of geothermal energy to address the increasing demand of renewable energy. At the Regional Level, UN Environment, in collaboration with the African Development Bank (AfDB), produced an Atlas highlighting the energy potential in all 54 African countries to guide strategic planning and public and private sector engagement in the energy sector in Africa. In terms of SDG 12 on SCP, some efforts have started regarding the promotion of sustainable public procurement (SDG target 12.7), education for sustainable lifestyle (SDG target 12.8), and sustainable tourism (SDG target 12.b).

For SDG 13 on climate change, progress includes community-based approaches for climate change (SDG target 13.3) with the involvement of most countries in the Ebafosa programme, climate change action plans (SDG target 13.2), and resources mobilised for climate change actions (SDG target 13.a). For SDG14, the progress achieved includes the development of an Ocean Governance Strategy and a regional decision to support ocean governance by AMCEN.

Areas where the SDGs will likely not be achieved without increased attention are national capacity development to generate and use environmental data (SDG

Solar energy shop in Sub-Saharan Africa (Ashden 2010).

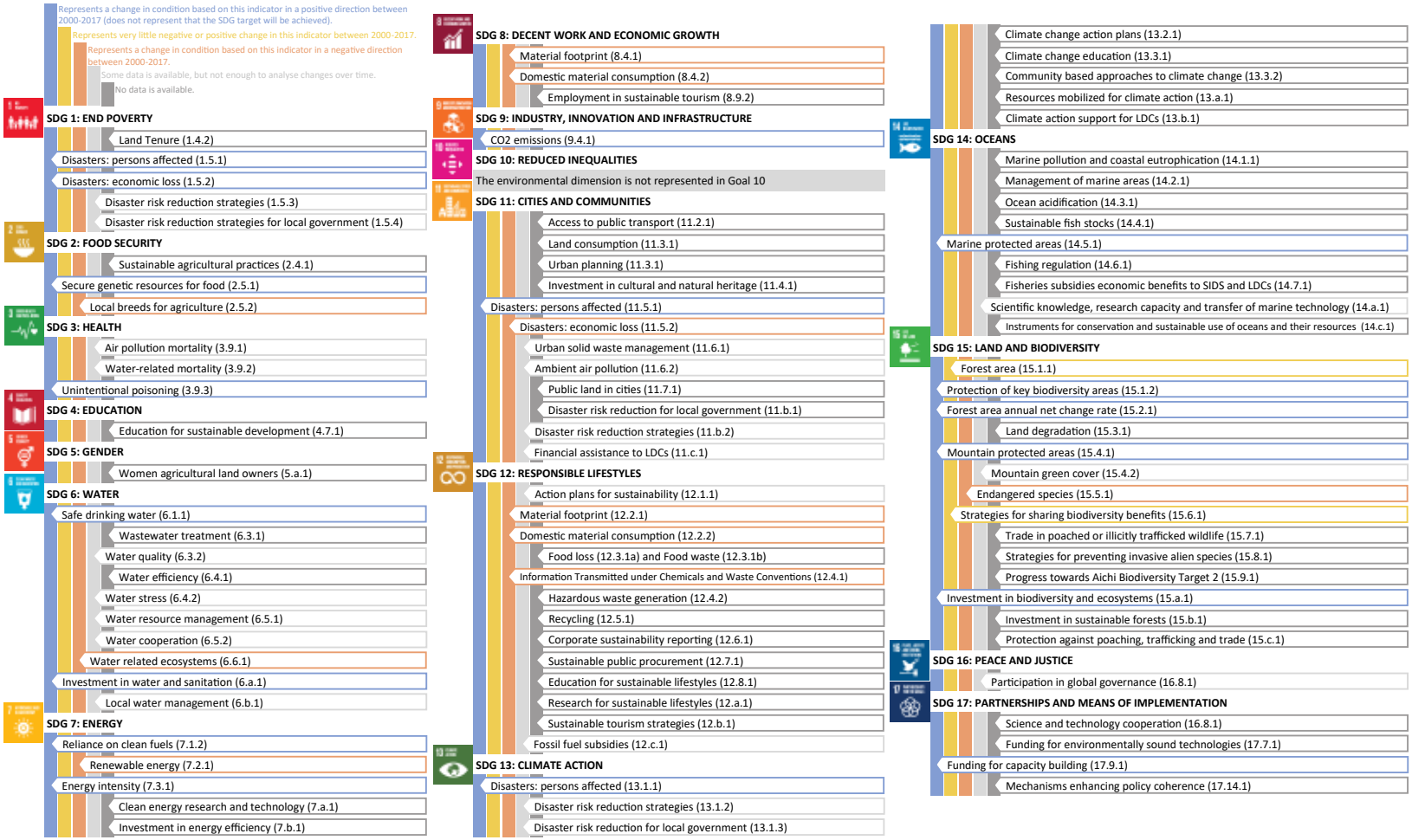
targets 17.18 and 17.19); many of the targets related to water (SDG 6); reducing air pollution mortality (SDG target 3.9); promoting disaster risk reduction (SDG target 1.5); education for sustainable development (SDG target 4.7); many of the targets related to oceans, land and biodiversity (SDG 14 and 15), in particular land degradation is a challenge (SDG target 15.3); and infrastructure-related CO_2 emissions (SDG target 9.4).

Conclusion

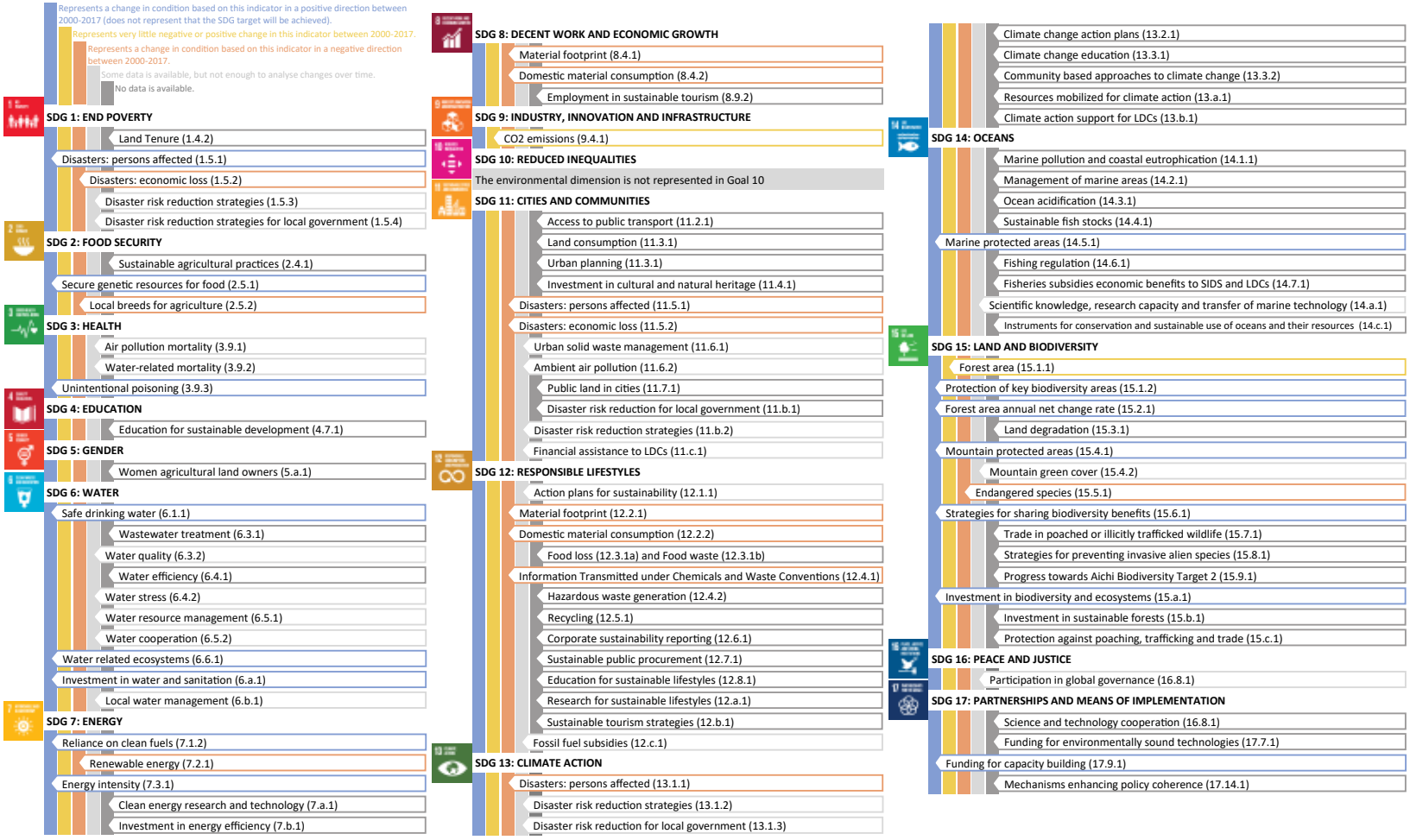
Countries are at different stages of SDGs implementation in Sub-Saharan Africa. Support is vital to assess efforts underway and to speed up progress. There is a need for additional support for capacity development through national bodies in charge of statistics as this is the most relevant way of identifying, assessing, measuring, and monitoring progress as well as making decisions to advance the SDGs. Strengthening statistical systems in Africa is therefore an imperative for successful implementation of the SDGs and Agenda 2063 as it underpins evidence-based policy making. Disaggregated data by age, gender, income, and geographical location is necessary to better target support for groups at risk of being left behind in the development process. The integration of SDGs across UNDAF has been in progress since 2017. Across Africa, there has been an effort to support UNDAF outcomes and outputs towards integrating environmental SDGs, mainly SDG 6, 7, 13, and 15 in the UNDAF process. However, efforts for building statistical capacity and SDG implementation still need to be scaled up.

Asia and the Pacific

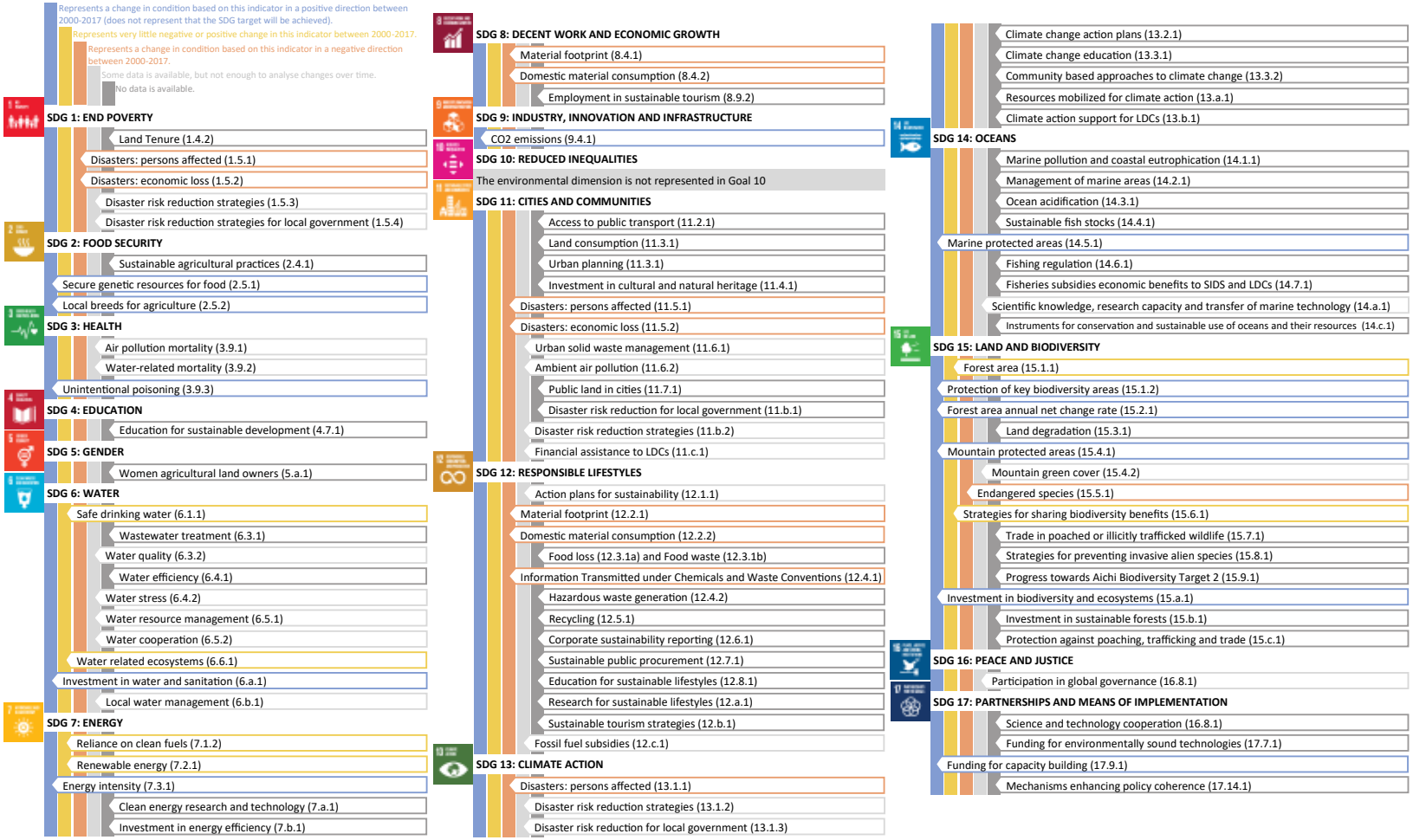
Central and Southern Asia



Eastern and South Eastern Asia



Oceania


Represents a change in condition based on this indicator in a positive direction between 2000-2017 (does not represent that the SDG target will be achieved).
Represents very little negative or positive change in this indicator between 2000-2017.
Represents a change in condition based on this indicator in a negative direction between 2000-2017.
Some data is available, but not enough to analyse changes over time.
No data is available.
SDG 1: END POVERTY
Land Tenure (1.4.2)
Disasters: persons affected (1.5.1)
Disasters: economic loss (1.5.2)
Disaster risk reduction strategies (1.5.3)
Disaster risk reduction strategies for local government (1.5.4)
SDG 2: FOOD SECURITY
Sustainable agricultural practices (2.4.1)
Secure genetic resources for food (2.5.1)
Local breeds for agriculture (2.5.2)
SDG 3: HEALTH
Air pollution mortality (3.9.1)
Water-related mortality (3.9.2)
Unintentional poisoning (3.9.3)
SDG 4: EDUCATION
Education for sustainable development (4.7.1)
SDG 5: GENDER
Women agricultural land owners (5.a.1)
SDG 6: WATER
Safe drinking water (6.1.1)
Wastewater treatment (6.3.1)
Water quality (6.3.2)
Water efficiency (6.4.1)
Water stress (6.4.2)
Water resource management (6.5.1)
Water cooperation (6.5.2)
Water related ecosystems (6.6.1)
Investment in water and sanitation (6.a.1)
Local water management (6.b.1)
SDG 7: ENERGY
Reliance on clean fuels (7.1.2)
Renewable energy (7.2.1)
Energy intensity (7.3.1)
Clean energy research and technology (7.a.1)
Investment in energy efficiency (7.b.1)
SDG 8: DECENT WORK AND ECONOMIC GROWTH
Material footprint (8.4.1)
Domestic material consumption (8.4.2)
Employment in sustainable tourism (8.9.2)
SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE
CO2 emissions (9.4.1)
SDG 10: REDUCED INEQUALITIES
The environmental dimension is not represented in Goal 10
SDG 11: CITIES AND COMMUNITIES
Access to public transport (11.2.1)
Land consumption (11.3.1)
Urban planning (11.3.1)
Investment in cultural and natural heritage (11.4.1)
Disasters: persons affected (11.5.1)
Disasters: economic loss (11.5.2)
Urban solid waste management (11.6.1)
Ambient air pollution (11.6.2)
Public land in cities (11.7.1)
Disaster risk reduction for local government (11.b.1)
Disaster risk reduction strategies (11.b.2)
Financial assistance to LDCs (11.c.1)
SDG 12: RESPONSIBLE LIFESTYLES
Action plans for sustainability (12.1.1)
Material footprint (12.2.1)
Domestic material consumption (12.2.2)
Food loss (12.3.1a) and Food waste (12.3.1b)
Information Transmitted under Chemicals and Waste Conventions (12.4.1)
Hazardous waste generation (12.4.2)
Recycling (12.5.1)
Corporate sustainability reporting (12.6.1)
Sustainable public procurement (12.7.1)
Education for sustainable lifestyles (12.8.1)
Research for sustainable lifestyles (12.a.1)
Sustainable tourism strategies (12.b.1)
Fossil fuel subsidies (12.c.1)
SDG 13: CLIMATE ACTION
Disasters: persons affected (13.1.1)
Disaster risk reduction strategies (13.1.2)
Disaster risk reduction for local government (13.1.3)
Climate change action plans (13.2.1)
Climate change education (13.3.1)
Community based approaches to climate change (13.3.2)
Resources mobilized for climate action (13.a.1)
Climate action support for LDCs (13.b.1)
SDG 14: OCEANS
Marine pollution and coastal eutrophication (14.1.1)
Management of marine areas (14.2.1)
Ocean acidification (14.3.1)
Sustainable fish stocks (14.4.1)
Marine protected areas (14.5.1)
Fishing regulation (14.6.1)
Fisheries subsidies economic benefits to SIDS and LDCs (14.7.1)
Scientific knowledge, research capacity and transfer of marine technology (14.a.1)
Instruments for conservation and sustainable use of oceans and their resources (14.c.1)
SDG 15: LAND AND BIODIVERSITY
Forest area (15.1.1)
Protection of key biodiversity areas (15.1.2)
Forest area annual net change rate (15.2.1)
Land degradation (15.3.1)
Mountain protected areas (15.4.1)
Mountain green cover (15.4.2)
Endangered species (15.5.1)
Strategies for sharing biodiversity benefits (15.6.1)
Trade in poached or illicitly trafficked wildlife (15.7.1)
Strategies for preventing invasive alien species (15.8.1)
Progress towards Aichi Biodiversity Target 2 (15.9.1)
Investment in biodiversity and ecosystems (15.a.1)
Investment in sustainable forests (15.b.1)
Protection against poaching, trafficking and trade (15.c.1)
SDG 16: PEACE AND JUSTICE
Participation in global governance (16.8.1)
SDG 17: PARTNERSHIPS AND MEANS OF IMPLEMENTATION
Science and technology cooperation (16.8.1)
Funding for environmentally sound technologies (17.7.1)
Funding for capacity building (17.9.1)
Mechanisms enhancing policy coherence (17.14.1)

Introduction

The Asia and the Pacific region share a strong commitment to advance the environmental dimension of the *2030 Agenda for Sustainable Development* as an enabling factor to advance the SDGs. To this end, many processes at the regional, sub-regional and national levels have been institutionalised. At the regional level, Asia-Pacific countries adopted the *Regional Road Map for Implementing the 2030 Agenda for Sustainable Development in Asia and the Pacific* at the Asia Pacific Forum on Sustainable Development that took place in Bangkok, Thailand, in March 2017 (United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP] 2017)[xvii]. The road map lays out priority areas, implementation arrangements, and a process for tracking progress on the SDGs to facilitate regional level cooperation in promoting the balanced integration of the three dimensions of the SDGs (social, economic and environmental) with a focus in the areas of social development, disaster risk reduction, climate change, management of natural resources, connectivity, and energy. The road map particularly highlights the importance of supporting the implementation of SDGs by developing countries, least developed countries (LDCs), landlocked developing countries, small-island developing States, and other countries with special needs.

In Southeast Asia, the *ASEAN (Association of Southeast Asian Nations) -UN Environment and Climate Change Action Plan 2016-2020* promotes cooperation and collaborative efforts towards the realisation of the *ASEAN Declaration on ASEAN Post-2015 Environmental Sustainability and Climate Change Agenda* as well as the *2030 Agenda for Sustainable Development and the 2015 Paris Agreement on Climate Change.* At the national level, Asia-Pacific countries have made considerable efforts to mainstream the SDGs into national policies, plans and strategies, including submission of Voluntary National Reviews (VNR) to the High-level Political Forum on Sustainable Development. From 2016 to 2018, 20 countries from the Asia-Pacific region submitted their VNRs, and 11 additional Asia-Pacific countries will do so in 2019. As the VNR is a state-led voluntary reporting process that involves multiple stakeholders to follow up on the SDGs implementation at the national level, the fact that many Asia-Pacific countries are submitting VNRs is a demonstration of their strong engagement and ownership at the national level to achieve the SDGs.

Statistical availability and capacity

The largest gap in the Asia Pacific region in terms of statistical availability and capacity exist in SDG 11 (Cities and Communities), SDG 12 (Sustainable Consumption and Production), SDG 13 (Climate Action), SDG 14 (Oceans), and SDG 17 (Partnerships and Means of Implementation) where majority of data are still not available or not sufficient to analyse changes over time.

The Asia-Pacific region must urgently address the large data gaps, as they limit a comprehensive and robust progress assessment of the SDGs and embrace new sources of data and partners to expand the scope of official statistics. There is a need to continue to support efforts towards reviewing the status and gaps of environmental data availability, strengths and weaknesses of the environmental data systems management reporting on state of environment, SDGs and MEAs; and strengthening statistical systems and data management capacity for implementation of and reporting on the progress of SDGs, including practical measures to expand the content and improve the quality of national statistical compendium, with a participative approach to engage interdepartmental partners in compiling the data.

Progress and gaps

In East and Southeast Asia, most progress has been made on SDG 15 (Land and Biodiversity), followed by SDG 2 (Food Security), SDG 6 (Water), SDG 7 (Energy), SDG 14 (Oceans), and SDG 17 (Partnerships and Means of Implementation). For SDG 7 (Energy), the East and Southeast Asia sub-region showed positive change in reliance on clean fuels (7.1.2) and energy intensity (7.3.1) as energy efficiency

Republic of Korea bans single-use plastics in all major supermarkets (Jun-ho 2018).

gained priority and has been realised in some sectors, particularly the industrial sector. Concurrently, energy intensity has steadily declined at the Asia-Pacific regional level (UNESCAP 2018). For SDG 14 (Oceans), progress was made against indicator 14.5.1 (marine protected areas) with Asia-Pacific region's total increase of 13.8 percent for coastal and marine protected areas in the period 2004-2017 (SDG target 14.5) (The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES] 2018). For SDG 15 (Life and Biodiversity), five indicators (15.1.2, 15.2.1, 15.4.1, 15.6.1 and 15.a.1) showed positive progress over the past 15 years. Countries in the Asia-Pacific region saw a 0.3 per cent growth in protected area coverage in terrestrial protected area between 2004 and 2017. Also, many countries in the region are on track to fulfil Aichi Biodiversity Target 11 of declaring 17 per cent of the land as protected areas.

The two areas that require most urgent and significant attention in the Asia-Pacific region are disaster risk reduction and resource efficiency. Indicators in these two areas are related to multiple SDGs and have showed setback during the past 15 years. For instance, disaster-related indicators (persons affected by disasters, economic loss from disasters, national/local disaster risk reduction strategies) belong to SDG 1 (indicators 1.5.1, 1.5.2, 1.5.3, 1.5.4), SDG 11 (indicators 11.5.1, 11.5.2, 11.b.1, 11.b.2) and SDG 13 (indicators 13.1.1, 13.1.2, 13.1.3), holding back progress of these three goals. Considering that the region lies in the 'Pacific Rim of Fire' and within the cyclone belt, Asia-Pacific needs urgent and significant attention in disaster risk reduction strategies. Indicators related to resource efficiency (material footprint, domestic material consumption) contribute to the regression of SDG 8 (indicators 8.4.1, 8.4.2) as well as SDG 12 (indicators 12.2.1, 12.2.2) and ultimately threaten the long-term sustainability of the resource-intensive, manufacturing-oriented economies of many countries in the region while contributing to significant environmental degradation with its health-related impacts. Inadequate capacity to manage fast-growing amounts of waste and wastewater undermines progress being made under other SDGs. The Asia-Pacific region alone generates almost 40 per cent of the world's waste (Kaza *et al.* 2018) and open dumping of waste continues to be the most commonly deployed waste management approach (UNEP 2017a). As to SDG 3 (Health), progress has been polarised. While a positive change has been observed for one of its 3 indicators (3.9.3), there are signs of major deterioration in condition associated with indicator 3.9.1 on air pollution mortality.

25 Indian states ban plastic bags (Phartiyal and Jadhav 2018).

Conclusion

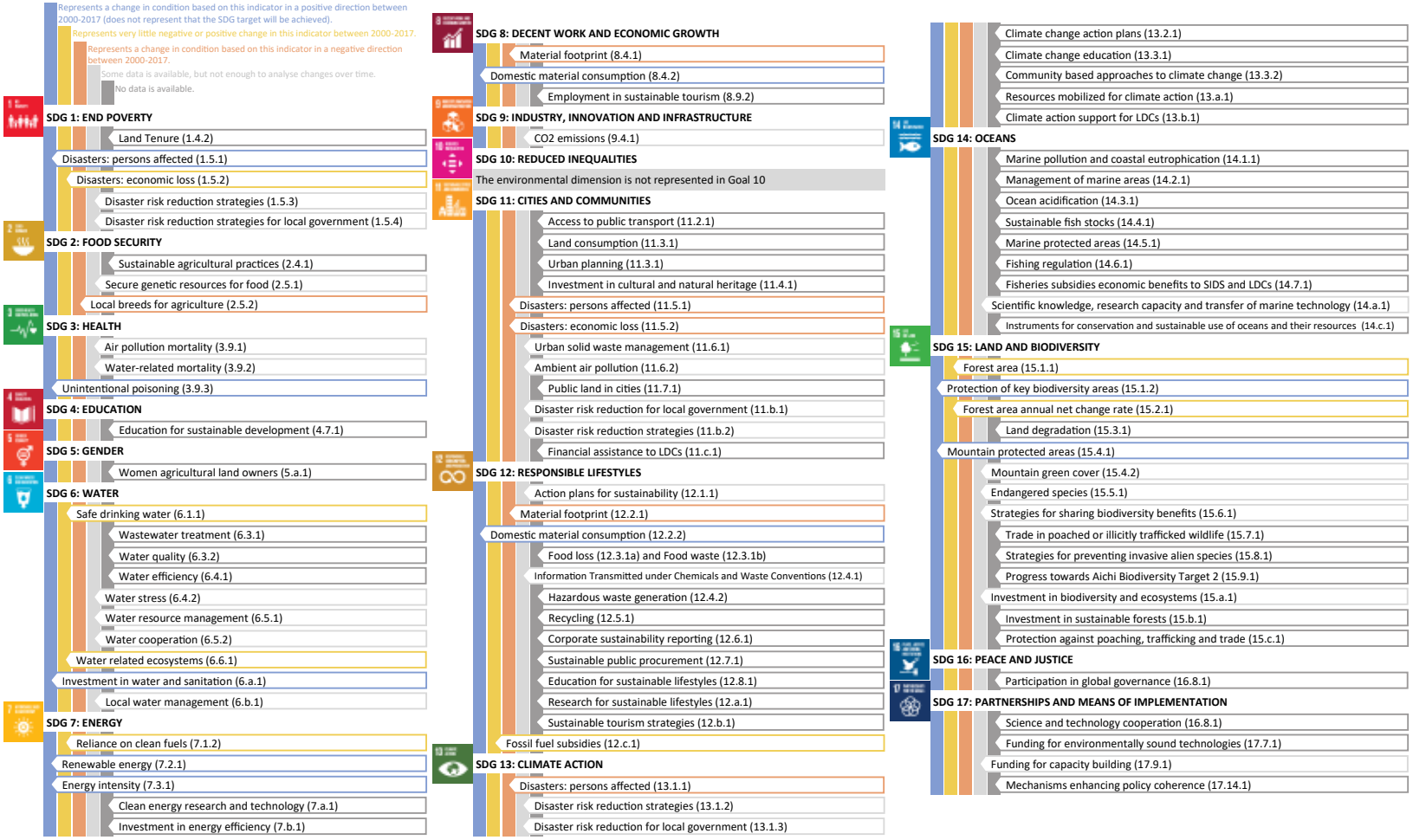
Progress towards the SDGs in each Asia-Pacific sub-region varies significantly. All sub-regions must accelerate progress if they are to achieve the environmental dimension of the SDGs. East and South-East Asia leads the region in its progress towards restoring water-related ecosystems (6.6.1), supporting LDCs in building sustainable and resilient buildings (11.c.1), and ensuring the conservation and restoration of forest area (15.1.1). Oceania has shown positive progress in maintaining the genetic diversity of local breeds (2.5.2) and reducing CO_2 emission per unit of value added (9.4.1), but has faced setbacks in disaster risk reduction, water quality and ecosystems, and sharing biodiversity benefits. The Central and South Asia sub-region shows progress in persons affected by disasters (1.5.1, 11.5.1, 13.1.1) and reducing CO_2 emissions per unit of value added (9.4.1), but shows set back in biodiversity-related indicators such as local breeds for agriculture (2.5.2), sustainable fish stocks (14.4.1), and strategies for sharing biodiversity benefits (15.6.1).

Many countries in the region have taken concrete steps to mainstream SDGs into national development strategies and priorities. For example, on World Environment Day, 5 June 2018, India announced that it will eliminate all single-use plastics by 2022 (SDG 11.6; SDG 14.1). Other countries, including Malaysia, New Zealand, and the Republic of Korea also recently joined the fight to reduce plastic waste by banning single-use products. India, Thailand, and Vietnam, with support from UN Environment and the Government of the Republic of Korea, are in the process of developing national action plans for sustainable public procurement to reduce negative environmental impacts of public sector spending (SDG 12.7). In October 2018, China released its Water Pollution Prevention and Control Plan for Major River Basins (2016-2020) (SDG 6.3) as part of China's efforts to improve environmental quality. National plans for clean air, water, and soil were issued separately after 2014, contributing to air quality improvement, water quality improvement, and soil environmental quality.

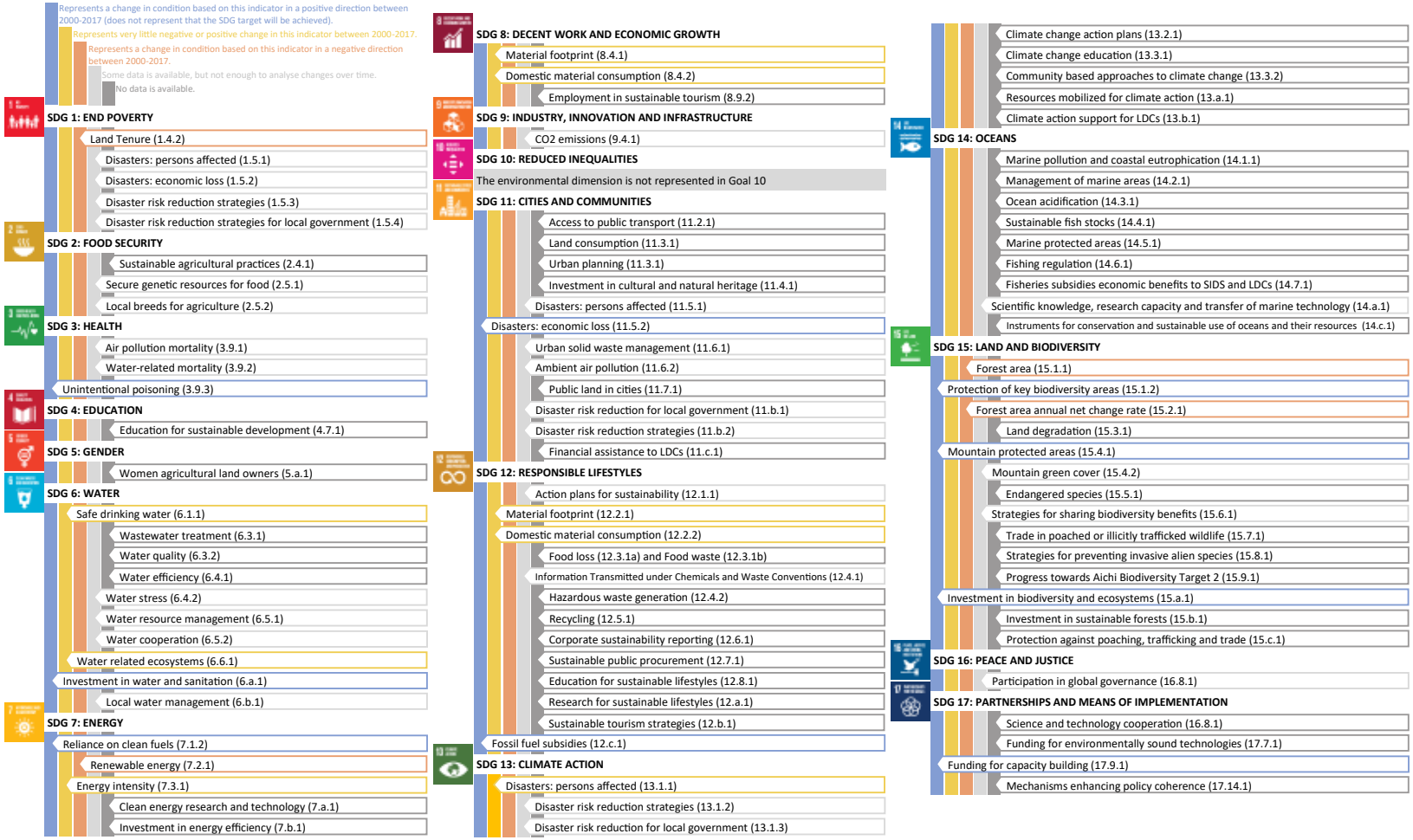
Based on this strong commitment and actions by the Asia-Pacific countries, more targeted support is needed for nations and indicators identified as being farthest behind, including the need to continue to support efforts towards building integrated PRTRs that include reporting on energy and water consumption and pollutant releases from production and consumption of products as a tool to efficiently address gaps in monitoring as well as facilitated, informed decision-making processes by the government and other stakeholders.

Europe and North America

Europe



Northern America



Europe

The pan-European region comprises of 53 countries and extends from the Atlantic to the Pacific and from the Mediterranean Sea to the Arctic Ocean. Geographical groupings include northern, southern, eastern and western Europe (UN groupings). Sub-regional groups include the European Union (EU), South Eastern Europe, Eastern Europe, the Caucasus, the Russian Federation and Central Asia. The region is diverse in terms of cultural, social, economic, environmental and political attributes (UNEP and United Nations Economic Commission for Europe [UNECE] 2016).

Introduction

There are many common environmental and sustainable development challenges faced by all the countries in the region as well as country-specific challenges. There are also differentiated responsibilities between sub-regions and countries in terms of priorities and implementing the SDGs. Europe is not only affected by global megatrends occurring well beyond its boundaries (e.g. diverging population and migration trends, increasing urbanisation, more global competition for resources, an increasingly multipolar world, and climate change) but also contributes to global drivers.

Statistical availability and capacity

Many European countries are well prepared from an institutional perspective to implement and monitor the SDGs both at the national level and at the multi-national level and are already using well established processes. SDGs implementation is the responsibility of everyone and each country will move forward with their own priorities; however, multilateralism and transboundary cooperation are not only critical, but a prerequisite for achieving the ambitious SDGs. In this regard, the United Nations Economic Commission for Europe (UNECE) Statistical Division and UN Environment are active in raising UNECE countries' capacities to monitor progress towards SDGs and targets through coordination and methodological work including support and guidance for the development of national SDGs reporting systems and capacity building.

In May 2017, following a wide consultation process, the EU agreed on 100 indicators through which to monitor progress towards the SDGs. These indicators are aligned as far as considered appropriate to the UN global framework (which the EU member state reports on) but are also linked to the context of long-term EU policies. Eurostat has been tasked with monitoring progress towards achieving the SDGs for the EU. It has produced two annual reports (Eurostat 2018) on progress in 2017 and 2018 which include a detailed monitoring report and an overview report. Eurostat also manages the SDGs database and has a comprehensive website displaying the indicators, providing datasets by region and by country.

Progress and gaps

Overall the EU Member States are making progress towards achieving most of the SDGs (European Union [EU] 2017). Over the last five years the most notable areas of progress have been for SDG 3 (Health), SDG 4 (Education) and SDG 7 (Energy). However, some progress has also been made on SDG 11 (Cities and Communities), SDG 12 (Sustainable Consumption and Production), SDG 5 (Gender), SDG 8 (Decent Work and Economic Growth), SDG 17 (Partnerships and Means of Implementation), and SDG 1 (End Poverty) (EU 2017).

Minor progress has been made for SDG 15 (Land and Biodiversity); however, this sends mixed messages as, based on other indicators, the EU is not on track to meet its policy targets "to protect, preserve and enhance the Union's natural capital" (European Environment Agency [EEA] 2018). At the broader pan-European regional level, biodiversity loss and ecosystem degradation are continuing and are mainly caused by increased land-use change, particularly unsustainable agricultural intensification, urbanisation, soil contamination and habitat fragmentation. Ongoing biodiversity decline and loss is particularly high in Eastern

Haze covers an urban center behind a neighbourhood in the pan-European region (Valentiny and Rodriguez 2016).

and Western Europe, with lower rates in Central Europe, the Russian Federation, and Central Asian countries (UNEP and UNECE 2016).

The EU also made minor progress towards SDG 2 (Food Security) and mixed progress towards SDG 9 (Industry, Innovation and Infrastructure). The one SDG where the EU is not making progress is SDG 10 (Reduced Inequality) which covers inequalities within and between countries and migration. Worryingly, there is insufficient data for the last five-year period to calculate and understand the trends towards achieving SDG 6 (Water), SDG 13 (Climate Action), SDG 14 (Oceans) and SDG 16 (Peace and Justice) (UNEP and UNECE 2016). This is due to a combination of the timeliness of data and the lack of a standard methodology for many of these indicators (UNEP and UNECE 2016).

The pan-European region is large and comprises of various geographical sub-regions. Non-EU countries include those in South Eastern Europe, Eastern Europe and the Caucasus, the Russian Federation, and Central Asia. As can be expected, with such diversity, progress towards achieving the SDGs is mixed. There has been significant progress across the region to promote SDG 7 (Energy), SDG 11 (Cities and Communities), SDG target 3.9 (air quality), SDG 13 (Climate Action) and SDGs 14 and 15 (Oceans and Land and Biodiversity). On the other hand, significant differences remain in resource efficiency and resource consumption (SDG target 8.4) and in the management and efficient use of natural resources (SDG target 12.2). Across the pan-European region, there was significant progress towards the MDGs. In the pan-European region, marked differences in average material footprint of consumption persist between EU Member States and countries from Eastern Europe, the Caucasus, and Central Asia. There are also significant intra-regional differences in the EU, with the material footprint of older Member States being significantly higher than that of the countries of the former Eastern Bloc (UNEP and UNECE 2016).

Bicycles parked over a canal in Amsterdam (Jace and Afsoon 2016).

Despite the progress achieved under SDG target 3.9 and SDG 13, there is a need to further promote air quality and climate action across the region. Climate change remains one of the largest threats to human and ecosystem health and to achieving sustainable development in the pan-European region, while also being an accelerator for most other environmental risks. Furthermore, despite improvements in air quality and in reducing pollution in many parts of the region, air pollution is now the greatest health risk to the region's population and other forms of pollution pose a threat to human health with the vulnerable and poor being the most affected (UNEP and UNECE 2016).

Conclusion

The region's share of global consumption and use of resources is unsustainable with marked differences between Western Europe and other parts. Climate change and poor urban air quality impact large swathes of the population in the region. Freshwater pollution is widespread and water availability continues to be stressed by climate change, especially in southern Europe and Central Asia. Biodiversity continues to decline despite the largest protected area network in the world being in place. Chemicals and waste are important issues within the region with the impacts of pollution and wastes transcending national and regional boundaries and affecting terrestrial and aquatic ecosystems. Climate change and pollution – in particular plastics – continue to threaten coastal, ocean, and marine environments; and finally, competing land uses such as agriculture, infrastructure and settlement continue to degrade ecosystems and threaten the sustainability of productive land.

While challenges remain, the pan-European region has many strengths and is driving forward the transition to a low carbon, green, and resource efficient/circular economy, evidenced by the current trends in decoupling economic output from environmental impacts. There is a strong policy framework being implemented in the EU and, notably, at the Eighth Environment for Europe Conference in Batumi in 2016, Ministers endorsed the Pan-European Green Economy Strategic Framework and launched the Batumi Initiative on Green

Economy (UNECE 2016a). In addition, UNECE, OECD, UN Environment, and UNIDO implemented the EU-funded programme "Greening Economies in the Eastern Neighbourhood" (EaP GREEN) in 2013-2017 to assist six countries of the Caucasus and Eastern Europe in their transition to green economies. The Batumi Action for Cleaner Air is a regional initiative supporting countries' efforts in improving air quality and protecting public health and ecosystems, promoted under the UNECE Air Convention (UNECE 2016b).

According to the GEO6 for the pan-European region, "the pan-European region is a leader in mechanisms for follow-up and review that will become increasingly important with the SDGs and their indicators: peer review such as Environmental Performance Reviews conducted by OECD and UNECE; reports to MEAs; the balance of legislation, executive action, enforcement and judicial review; the independent role of civil society organisations; and the role of the media and public opinion. The pan-European region can continue to be a pioneer in institutional innovation, balancing supra-national coordination and subsidiarity as appropriate, while building regional solidarity and cohesion in implementing the SDGs" (UNEP and UNECE 2016).

North America

The United States (U.S.) and Canada are included in the regional SDGs grouping for Europe and North America thus are included as part of the Scorecard presented under the Europe section of this publication.

Introduction

Canada and the U.S. were supporters of the adoption of the SDGs in 2015 and recognised the need to invest in sustainability. They also acknowledged the potential of the global goals and the supporting architecture (targets, indications, and universal means of implementation) to serve as an effective roadmap for their respective efforts to advance sustainability at home and abroad. The environmental problems of highest priority for the region (e.g. climate change, water security, contaminants of emerging concern and land fragmentation) highlight a new receptivity to systems thinking, issue linkages and a recognition of the need to combine the best traditional policy approaches with reflexive governance approaches (UNEP 2016b).

Regional progress in North America toward the SDGs is not only relevant for Canada and the U.S. domestically but is also crucial for the global achievement of the goals due to the global significance of these two economies as their political, economic, and social choices and interventions can have far-reaching global environmental impacts. For example, the U.S. is the biggest historic emitter of CO_2 and remains one of the largest annual per capita and total emitters in the world—thus, its disproportionate contribution to global emissions impacts international efforts to mitigate and adapt to climate change (SDG 13). Coordinated regional action is key for global emissions reductions because even though the U.S.' total emissions is larger than Canada's, on a per capita basis these two countries' emissions are strikingly similar - in 2016, for instance, Canada's per capital emissions was 18.6 tons of CO_2, while the United States' was 15.5 tons of CO_2 (Janssens-Maenhout *et al.* 2017). Coordinated regional action in North America is therefore key to global emissions reductions as the region's disproportionate contribution to global emissions impacts international efforts to mitigate and adapt to climate change (SDG 13).

Since the adoption of the SDGs, the U.S. has set in place a digital National Reporting Platform to help identify, monitor and report progress on the SDGs at the indicator level (United States of America [USA] 2019). In addition to the platform a series of tools and guidelines have been developed to assist relevant federal agencies and managers (USA 2019). Similarly, Canada has put in place several processes to advance the implementation of the SDGs – and its commitment to monitor and report against the agreed indicators. Canada is actively expanding its SDGs reporting capacity and in April of 2018, committed $100 million dollars toward SDG implementation including resources to establish a federal unit to support coordination.

Statistical availability and capacity

The U.S. has set in place a national reporting platform to identify and update relevant sustainable development statistics (sdg.data.gov). However, two-thirds of the proposed indicators require improvements or further exploration of the data. The U.S. has reported on only five (18.5%) of the 26 indicators for which UN Environment is the Custodian Agency. Four of these reported indicators have been updated since the adoption of the SDGs in 2015. Another 14 (52%) of the indicators' status are marked as "improving measures", while 8 (30%) are marked as "exploring data".

The Sustainable Development Goals Data Hub is Canada's National SDG portal and is maintained by Statistics Canada. Canada has reported on just 7 (30%) of the 27 indicators for which UN Environment is the Custodian Agency. 5 of these

Flood mitigation in Canada (Government of Alberta 2014).

reported indicators have been updated since 2015. 14 (52%) of the indicators are marked as "under development", while 6 (22%) are under the status of "exploring data sources."

The aggregate picture shows room for improvement for North American data reporting, but also the need for a wider scope of global environmental data collection and reporting. Canada is actively expanding its SDGs reporting capacity with the most recent federal budget providing for the establishment of an SDGs Unit to support coordination of SDGs implementation and support for Statistics Canada to expand monitoring and reporting activities related to SDGs implementation. While Canada's SDGs progress reporting is limited for environmental indicators, the Government of Canada does keep an updated database of environmental indicators (Statistics Canada 2018a) that spans air, water, climate, wildlife/habitat, and socio-economic indicators. These indicators do not specifically report on the UN Environment custodian SDGs, but they do present relevant environmental data and show Canada's ambition to measure the state of its environment.

Progress and gaps

The lack of official national reporting on SDGs indicators in North America does not imply that there has not been any progress on the environmental dimension of the SDGs. However, it does make it difficult to rigorously assess progress. In the U.S., state and local governments have been leading the push for progress on environmental SDGs. There have been a number of private sector and city level initiatives related to sustainable development, including the "We Are Still In" campaign, a coalition of mayors, governors, and business leaders committed to meeting the targets of the Paris Agreement. New York City submitted to the High-Level Political Forum the first voluntary local review which details the city's ambitions for meeting the 2030 agenda. At the national level, the U.S. is addressing SDG 12.3 through a food loss and waste reduction goal of 50% reduction by 2030 (USDA 2019). In October 2018, the federal government also signed into law the Save our Seas Act which reauthorized a national Marine Debris Program and outlined the U.S.'s ambition to address international waste management issues in developing countries (United States Congress 2018).

In Canada, there has been significant progress towards many of the environmental SDG targets. A few examples include: under SDG 6 (Water), the Investing in Canada Plan provides support for infrastructure solutions including treating water and wastewater, managing storm water, and mitigating the impacts of flooding and other risks; under SDG 12 (Sustainable Production and Consumption), the Government of Canada announced the $155-million Clean Growth Program in 2017, the Clean Growth Hub, officially launched in January 2018, and a number of other initiatives (e.g. there are more than 160 regulated and voluntary extended producer responsibility and product stewardship programs in Canada); under SDG 14 (Oceans) and SDG 15 (Land and Biodiversity), Canada launched a $1.5-billion Oceans Protection Plan in 2016 and committed $1.3 billion over 5 years to protect Canada's Nature Legacy; and under SDG 17 (Partnerships and Means of Implementation), Canada's international assistance exceeds $5 billion annually. The 2018 federal budget announced an additional $2 billion in new funding for international assistance over 5 years with 50 per cent of Canada's bilateral international development assistance directed to Sub-Saharan African countries by 2021-2022.

Although there has been progress towards achieving the environmental dimension of development, the withdrawal of the U.S. from the Paris Agreement and the rollbacks of many environmental regulations and policies by the current U.S. administration have caused uncertainty about the country's progress towards environmental SDGs. In the case of Canada, BCCIC estimates that Canada is currently not on track to implement the 2030 Agenda and noted some particular pitfalls in the environmental dimension of development. For example, at the end of 2017, 67 rural and indigenous communities across the country did not have access to clean drinking water, recycling and waste management programs need to be

Emissions in front of Mt. Baker in Washington State, North America (Jon 2013).

adjusted to ensure that the sector can continue to ensure long-term environmental and economic sustainability, and half of Canada's monitored species have been under decline in the past several decades with several populations of iconic Canadian wildlife such as mountain caribou on the brink of extinction (The British Columbia Council for International Cooperation [BCCIC] 2018). Additionally, the U.S. and Canada have some of the largest per capita material footprints and the highest consumption rates per capita. (SDG-Tracker 2019).

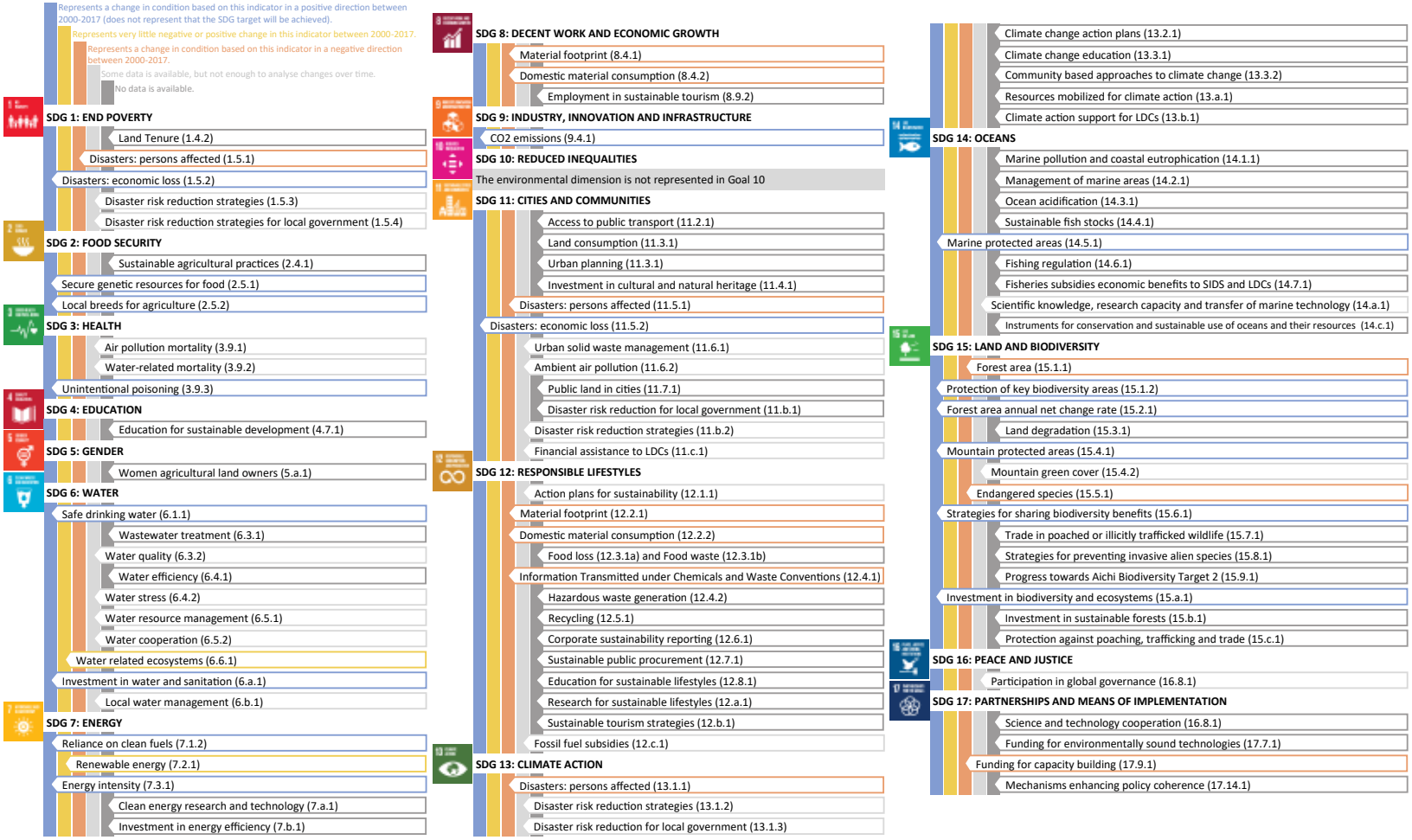
Conclusion

Analysis of the progress towards achieving the environmental dimensions of the SDGs in North America reveals a mixed picture and limited progress, with significant upscaling required to achieve the 2030 aspirations. While the SDGs have an important place across U.S.' and Canadian communities and within the respective federal governments, it is clear that progress towards several goals is lagging. Although, Canada and the U.S. have made progress on goals related to water (SDG 6), oceans (SDG 14) and life on land (SDG 15), there still remain challenges in terms of achieving these goals. North America is facing additional challenges in terms of SCP (SDG 12), particularly with respect to addressing the high per capita material footprint in these countries as well as in tackling inequality in terms of access and use of natural resources and addressing climate change (SDG 13).

Economic development does not imply that development is sustainable, inclusive, or just. Achieving the SDGs in the North American context will require deliberate and collaborative effort (in the U.S. and Canada) to match the shared goals with solutions that work at scale.

Latin America and the Caribbean

Latin America and the Caribbean



Introduction

The Latin America and the Caribbean region is advancing in the implementation of the 2030 Agenda by establishing interinstitutional coordination mechanisms, aligning the National Development Plans with the SDGs while formulating national visions towards 2030. New and/or updated institutional arrangements are in place in at least eighteen countries for the coordinated implementation of the 2030 Agenda. In some countries, the national environmental institutions have been granted participation in such mechanisms, implying a clear change in their contribution and role especially when compared to the process adopted for the implementation of the MDGs. However, still only eleven (out of eighteen) national mechanisms ensure the direct participation of the Ministries of Environment, and not always at the highest level (UNEP and Cepei 2018). Additionally, to different extents, the region reveals a deficit in the production and management of data and statistics and related disaggregated information, including environmental indicators. As a result, the systematic use of environmental information in conjunction with social and economic data to support coherent policy and decision making is still limited to a few cases in the region. In general, the inclusion of the environmental dimension across the SDGs planning, implementation, and monitoring is yet to be fully achieved as shown by the VNRs presented so far at the High-Level Political Forum (UNEP 2018b).

Statistical availability and capacity

The economic and technical heterogeneity of the region is well reflected in the existing differences in observation capacity, and related data and statistics production. While some countries have developed sustained and systematic mechanisms for data collection, validation, and processing, others are struggling with structural data gaps and weak capacities. The most critical areas for which serious data gaps currently exist include SDG 11 (Cities and Communities), SDG 6 (Water), and SDG 14 (Oceans). For many countries, the costs incurred to establish and maintain effective data infrastructures are often not congruent with the limited budget available to central and local governments. This lack of resources poses important limitations in the capacity of countries to monitor and report on the implementation of the environmental dimension of Agenda 2030. Feasible solutions to mitigate or limit the existing gaps in frequency and spatial coverage of data are currently being explored in the region, including use of non-conventional data (e.g. crowdsourced data (citizen science) and remote sensing) though legal aspects and capacities for their use are still important barriers for their full exploitation. The region has benefitted from the presence of a significant number of Space Agencies and related internationally-recognised Earth observation programmes. The assimilation of these capacities within the usual data production workflows must be considered to ensure systematic and sustained monitoring of the environment (e.g. land use changes, forest cover, water management, etc.).

Weak data coordination is another important limiting factor for sustained SDGs indicators production. In many countries, lack of data sharing policies along with commercial and legal constraints on data use hamper the effective monitoring of the environment. The relationship between the environment and the social and economic dimensions of development, amplify the need to share data. Countries of the region are working in the framework of the Latin American and Caribbean Initiative for Sustainable Development to advance their capacity to produce data and indicators.

Progress and gaps

Most of the progress of the region so far is related to setting the scene for the 2030 Agenda including establishing institutional arrangements, advancing national planning, and consulting with development stakeholders. In terms of substantive advances, the region is building in its long-term commitment with the Sustainable Development Summits. During the last decades, committed and innovative social actors from civil society, communities, governments, and the private sector have successfully put sustainable development initiatives into practice at different scales, including initiatives related to food insecurity, resilience to climate change,

Coffee plantation in Latin America (Parra 2017).

and access to water. The Latin America and Caribbean region has the opportunity to build on and upscale existing efforts from all development actors that have worked for sustainable development and have developed options and tools (UNEP 2016a). Regarding the promotion of the rule of law and insurance of equal access to justice (SDG 16), the region adopted an Agreement on Access to Information, Public participation and Access to Justice in environmental matters which includes specific provisions on rights of environmental defenders (UN 2018b).

Latin America and the Caribbean is a complex region, rich in natural resources, with varied territories and cultures, great economic opportunities, and a dynamic population. However, it still is one of the most socially unequal regions in the world and one of the most dependent on its natural capital (UN Environment/UNU, 2014). Thus, its economies continue to be strongly based on primary products and natural resources, accounting for almost 50 per cent of the region's exports (e.g. soy, coffee, sugar and meat, oil, coal, copper, and other minerals) (UNEP 2016b). Given the increase in population and the demand for raw materials for consumption and exports, data indicates that current and future growth in the region is likely to be at the expense of environmental services (e.g. water supply, climate regulation, and support for agriculture) and natural resources (e.g. minerals, marine resources, and genetic resources) (United Nations and Economic Commission for Latin America and the Caribbean [ECLAC] 2018). The total land area under protection, between 1980-2015, increased from 8.8 per cent to 23.4 per cent and deforestation fell from 4.45 million hectares per year between 1990-2000 to 2.18 million hectares per year between 2010-2015. However, important ecosystems and ecological processes in the region continue to be affected. Data indicate that although the rate of conversion of natural systems has begun to slow, the overall rate of loss of ecosystems remains high. Forests have shown an overall decrease of 9.4 per cent across the region since 1990; however, this regional aggregate has potentially masked a noteworthy area of success. For example, in the Caribbean, there has been an increase in the extent of forested area by 43 per cent over the 1990 baseline (UNEP 2016b).

The growth model, coupled with limited redistributive policies, is already reflected in marked territorial and population inequalities (affecting indigenous and afro-descendant populations in particular) regarding access and management of natural resources and development benefits which are likely to worsen in the climate change scenarios developed for the region. One expression of this inequality is the socioenvironmental conflicts that have emerged with increasing force in the region (Not an Atlas 2018). Other expression of the unsustainability of

Reforestation in Costa Rica (World Resources Institute 2016).

the development patterns is the decline in air quality in cities. In most cities where data are available, the concentrations of particulate matter and ozone are above the World Health Organization (WHO) guidelines. This increases the vulnerability of urban dwellers to respiratory diseases; and more than 100 million people in the region live in areas susceptible to air pollution.

Conclusion

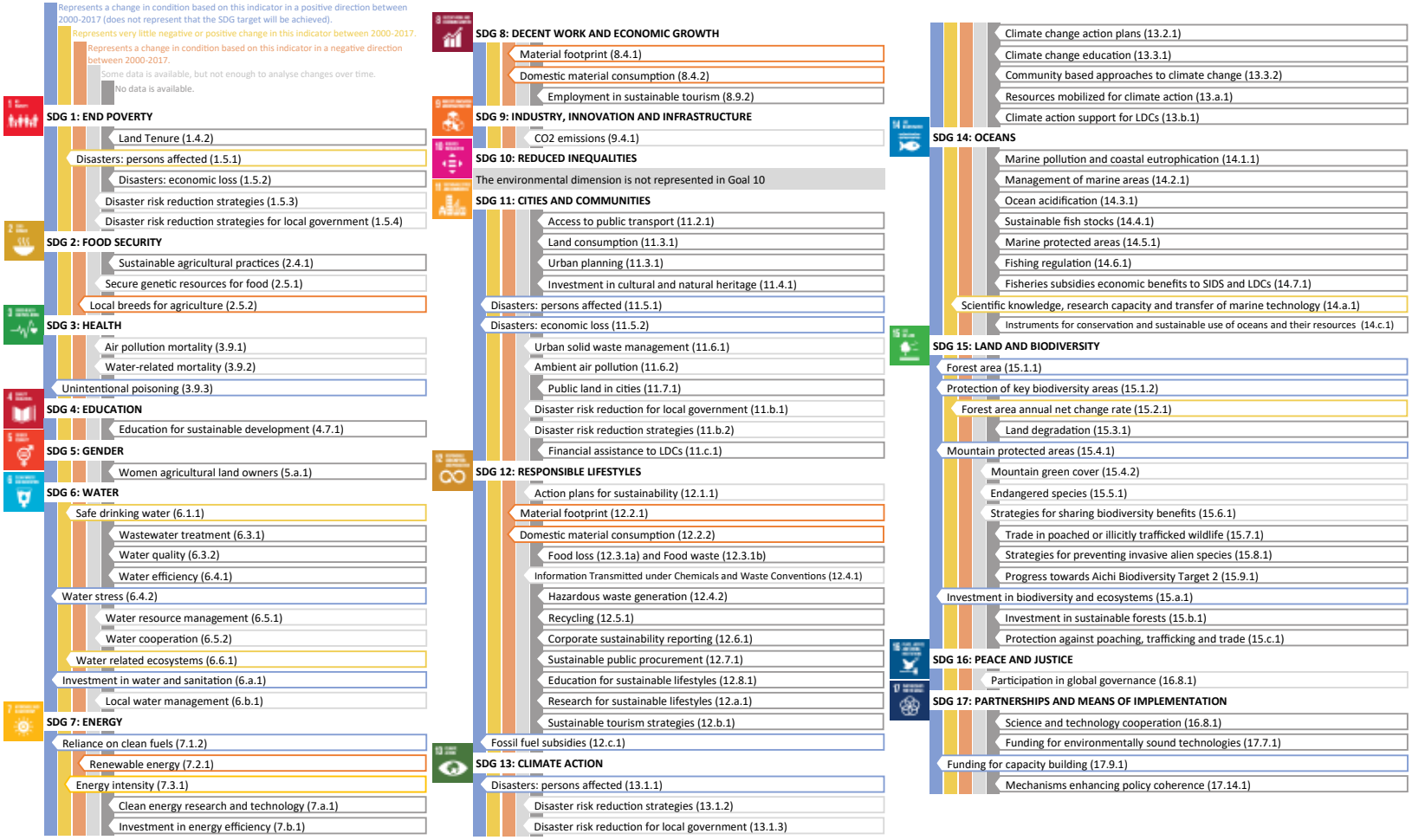
The future of the region's economies, as well as the ability of countries to fight poverty and reverse inequality, depends heavily on the region's natural capital and the ability of governments, the private sector, civil society, and communities to effectively manage it. Although there are noteworthy successes in the region's efforts to manage its natural asset base and to address a number of socio-economic challenges, data indicates that progress is likely taking place at the expense of the environment. Whether driven by the demands of a growing population, fueled by economic factors within or outside of the region, or facilitated by the absence of effective governance structures, it is generally accepted that patterns of production and consumption within the region are currently unsustainable. This trade-off between human progress and environmental health is no longer sustainable and needs to be addressed with urgency if the region is to secure sustainable development and the well-being of its population.

In that context, the adoption of the Escazu agreement is an encouraging step to address existing challenges. There is a need to continue to support efforts towards its entering into force and implementation at the national level, including the development and availability of environmental information (e.g. integrated PRTRs that include reporting on energy and water consumption and pollutant releases from production and consumption of products), ensuring mechanisms for public participation in decision making, and strengthening the access to environmental justice.

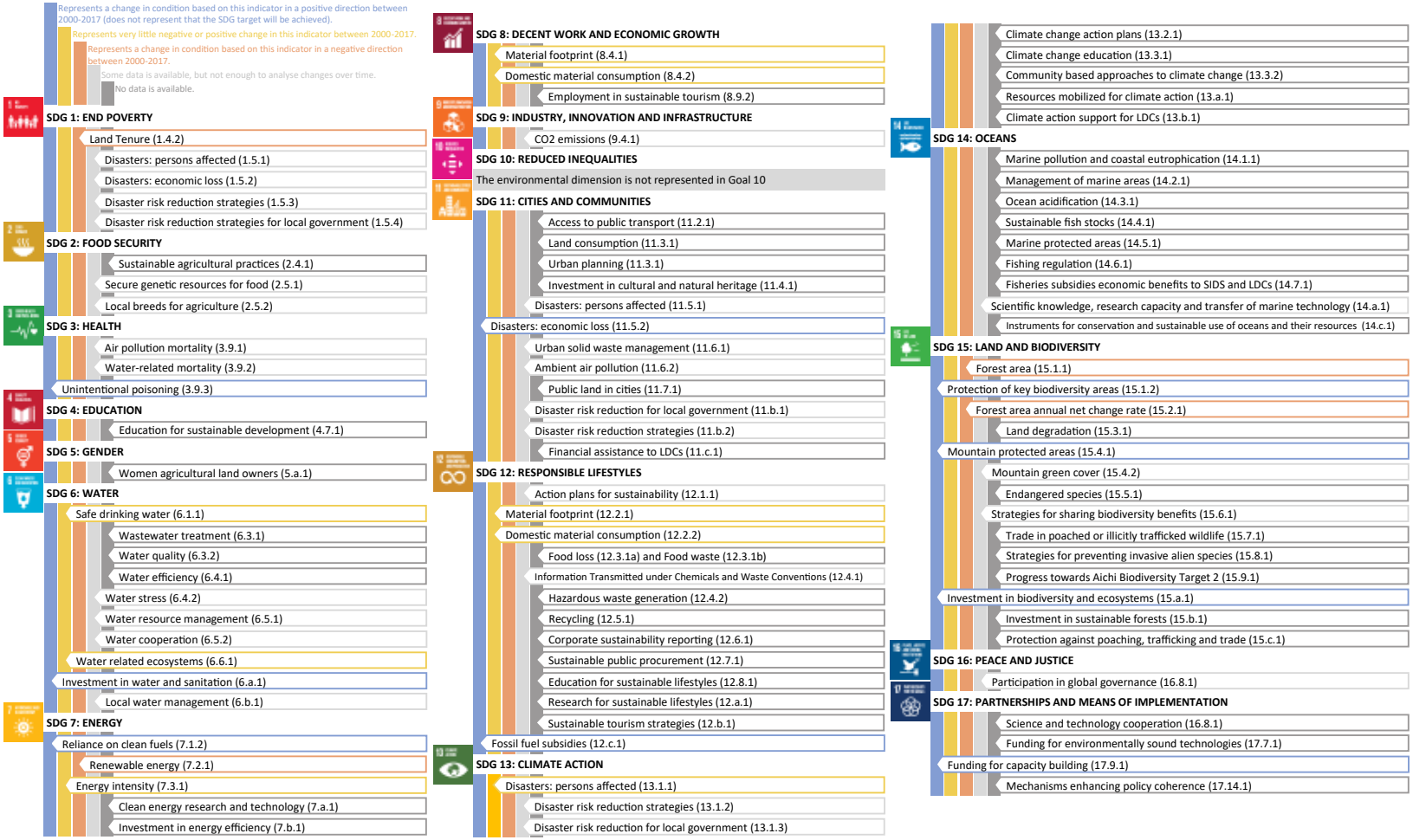
Additionally, the existent synergies between MEAs and the SDGs are not fully mapped and exploited at the national level as their contributions to the 2030 Agenda are usually not identified and coordinated with its implementation. It is important that countries consider the advances in the implementation of the MEAs and their contribution to specific SDGs targets as a way to create synergies between both processes, rationalise implementation and reporting efforts, and ensure a stronger environmental dimension in all 17 SDGs. Interministerial and multi-stakeholder coordination is one of the key mechanisms to strengthen this synergistic implementation.

West Asia and North Africa

Western Asia



Northern Africa



Introduction

Over the past two decades, the West Asia and North Africa region has witnessed remarkable developments in education (SDG 4), public health (SDG 3), and infrastructure expansion (SDG 9). However, whilst some progress is undeniable, it was unequally distributed within and between countries and, in some cases, these developments were fragile and unsustainable. Protracted conflicts, occupation, poverty and exacerbated inequality, along with water and energy insecurity are just a few of the barriers currently standing in the way of achieving SDGs in the region, all of which are exacerbated by the lack of a comprehensive and coordinated framework of environmental governance.

One of the largest challenges facing West Asia and North Africa today is the scarcity of renewable water resources (SDG target 6.3, SDG target 6.4, SDG target 6.5), which directly impacts the region's ability to produce enough food to meet the population's needs (SDG target 2.4). This challenge is further complicated by a rapidly increasing population due to both high birth rates and large numbers of migrants. This population growth places further strain on industrial development needs and urbanisation. As with all SDGs, the interconnected nature of the issues makes tackling sustainable development without a comprehensive, region-wide action plan untenable. This becomes abundantly clear if the region's water and energy insecurity is looked at in greater detail. The provision of water to the region is directly reliant on energy in both traditional and more urbanized production, whilst the industrialized nature of many of the oil-rich states in the region means that there are sizable variations in water usage, quality, and the energy required for its provision (SDG 9.5). Whilst in recent years there has been more of an impetus placed on sustainable energy supply, this requires both significant investment and the continued use of current energy sources. Given the interdependency of these factors, it is critical to address priorities cohesively in order to increase the region's social, political, and environmental security and stability.

Statistical availability and capacity

There has been significant evidence in West Asia and North Africa of regional support for the attainment of SDGs and the gathering of data in order to monitor their progress. Indeed, regional organizations have made significant progress in developing frameworks and tools that support countries and enhance their capacities to achieve the environmental dimension of the SDGs. A regional reporting platform called The Arab Working Group on Sustainable Development Indicators has been established and is chaired by the League of Arab States, and is therefore representative of all states in the West Asia and North Africa region.

Through this initiative, a core set of 83 indicators aimed at monitoring the progress of the agreed regional strategic framework for sustainable development were agreed upon and adopted. However, many members of the initiative encountered difficulty in their ability to report on these agreed-,upon indicators and, as such, it was conceded that the number of indicators be reduced to 44. This differentiation in capabilities between nations seems to be the trend across the region that most limits West Asia and North Africa in gathering statistical data on the progress of the SDGs. However, there are several issues that are present within every nation in the region, the first of which is characterized by a lack of support. This need for additional support relates both to funding, the lack of which is a common theme throughout the region, and to capacity building. This is vital as additional support in these areas would allow for the assurance that the required data and information was being produced, as well as ensuring the sustainability of said production. Additionally, there is a marked lack of data underlining the need for field surveys conducted with the aim of bridging data gaps and allowing for the formulation of data flows to populate the agreed set of indicators laid out by the Arab Group on Sustainable Development Indicators. However, this issue is further aggravated by the unavailability of qualified researchers and environmental experts to collect, collate, and analyze data regarding the implementation of SDGs in the region. Some countries find themselves at a further disadvantage through their lack of processes for sharing data at the national level. This results in poor coordination between the institutions functioning within the nation. Whilst this may be more apparent in lower-income nations, it is nonetheless a trend across

Thermo-solar power plant in Morocco (World Bank 2010)

the entire region. Currently, the League of Arab States, UN Environment and UN-ESCWA are working in conjunction to consolidate an environmentally-focused SDGs Priority List of the Arab Working Group on Sustainable Development as was agreed in Amman in March 2017, with the environmentally-related SGDs Priority List of the Implementation Framework for the Environmental Dimension of the 2030 Agenda in the Arab Region adopted in Cairo in September 2017 in line with the recommendation of the Arab Ministers Responsible for the Environment. The Arab Land Initiative also provides a good framework which would help further the environmental dimension of development (UN-Habitat 2018a).

Progress and gaps

At present, the protracted conflicts, economic marginalisation, and increased stress on the environment and economy all endanger the progress of sustainable development in the West Asia and North Africa region. However, should the regional priorities be examined in isolation from social, economic, and institutional priorities, the scope and impact of solutions will be ephemeral. As such, SDG 13 on Climate Change is particularly critical to the successful implementation of sustainable development initiatives in the region as it not only tackles several pertinent climate hazards faced by West Asia and North Africa (e.g. increased temperature, variable rainfall, and rising sea levels), but also underlines the interconnected nature of sustainable development. Impacts of climate change are expected to be felt in water resources, agriculture, biodiversity, public health, and coastal development, all of which are pertinent issue areas to the West Asia and North Africa region and would benefit from their interconnectedness being acknowledged as a policy priority. Additionally, the economic, social, and environmental impacts and costs resulting from climate-related extreme events such as heat waves, floods, cyclones, droughts, as well as sand and dust storms, are already evident in the region. Indeed, under business-as-usual conditions, it is expected that unsustainable development will continue, accompanied by exponential population growth that exceeds the environment's carrying capacity. Already the uncontrolled human consumption in the region has led to an increase in municipal solid waste production, 90 per cent of which is disposed of in unlined landfill sites and leachate from these is contaminating scarce groundwater reserves. The pursuit of SDG target 12.4 is generally hampered by technical, administrative, and financial shortcomings in some countries. Hence, achieving effective environmental governance requires a holistic examination of the nature of regional priorities and their interdependencies in order to propose solutions that are relevant and produce more permanent outcomes that reflect the seriousness of the region's challenges.

Road after a sandstorm in Dubai (Schwaerzler 2017).

Conclusion

Countries within North Africa and West Asia are showing various levels of capacity to monitor the implementation of SDGs. However, there is evidence of an impetus to advocate on behalf of and nurture the initiatives laid out by the 2030 Agenda. As such, the forward-looking focus for the West Asia and North Africa region should be to provide support, particularly in regard to capacity development of national bodies, wherever possible. This is the most direct route to identifying, assessing and monitoring progress. Although West Asia and North Africa has made some progress in relation to education (SDG 4), health (SDG 3), and infrastructure development (SDG 9), there still remains significant challenges in terms of achieving these goals in a proportionate and sustained manner. Furthermore, the region faces a multitude of challenges, with many threatening to worsen as a direct result of climate change, and it is only through the adoption of a holistic approach to these issues, and together with the establishment of environmental databases such as PRTRs as basis for monitoring and effective decision making, that significant and sustainable beneficial policies can be enacted.

Ness 2016

Thematic Analysis

The thematic analysis covers all environment-related SDGs. For the SDG indicators that have available data, the thematic analysis is based on the data for that indicator. For the SDG indicators that do not have available data, the thematic analysis is based on current actions, proxy information, and other information. The overall assessment of progress for this section is an exact match with the assessment of progress in the Scorecard in Figure 3.

Note that some SDGs indicators appear in multiple Sustainable Development Goals. For the purpose of the thematic analysis, these indicators will only have a description the first time they appear, with a reference included in all other relevant sections of the report.

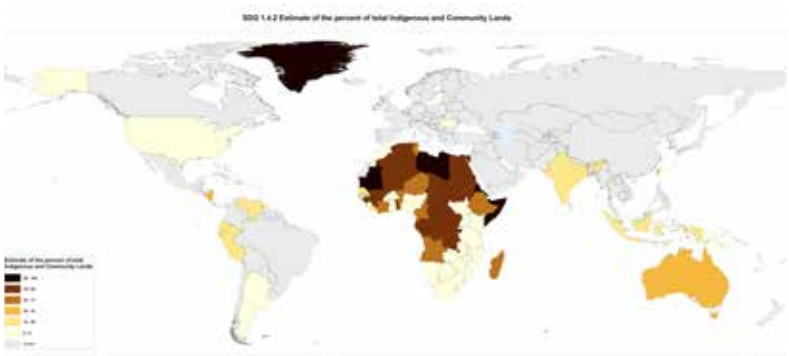
SDG 1: End Poverty

Land tenure (SDG 1.4.2)

No data available

Proportion of total adult population with secure tenure rights to land, with legally recognised documentation, and who perceive their rights to land as secure, by sex and by type of tenure.

Percent of indigenous and community lands - not formally recognised



Source: The Land Portal Foundation (Land Portal 2017)
Tier II; Custodian agency: UN-Habitat & World Bank

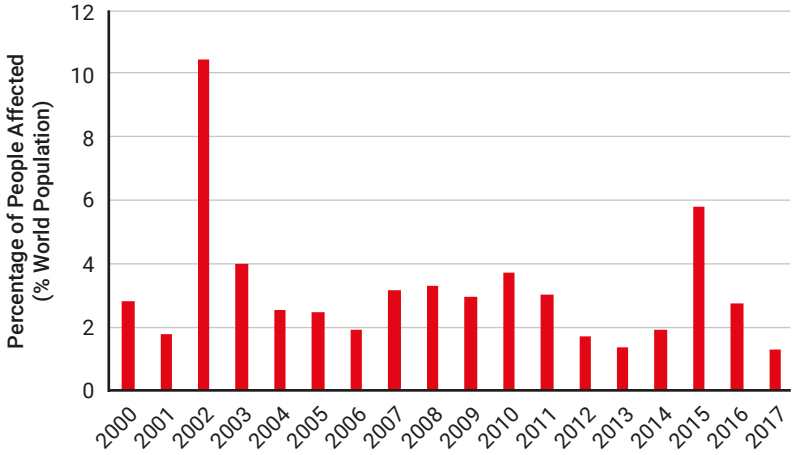
Secure land tenure for vulnerable populations forms a foundation for food security, promoting sustainable land use, and reducing environmental migration. Land tenure regulates how people access land, forests, fisheries, and other natural resources, including who can use what resources for what purposes (Food and Agriculture Organization [FAO] 2012). Ensuring that women, indigenous peoples, and other vulnerable populations have secure land tenure determines whether these populations have access to and control over food and income, especially during food shortage, to which climate change and environment degradation are key factors. Despite women's lack of land ownership, their role in ensuring food security should not be overlooked, as they are often the ones who work on the farms, especially in Sub-Saharan African countries. Currently there is very little data on either the population with legally recognised documentation over land or the population that perceives their land rights as secure (Kumar, Quan and Mboup 2017). The percentage of indigenous and community lands which are not formally recognised provides some insight into security of land tenure. In much of Africa, indigenous and community land which are not formally recognised is more than 50 per cent of the total land area which reveals the vulnerability of many indigenous people.

Disasters: persons affected (SDG 1.5.1)

Change in a positive direction

Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population.

People affected by natural disaster



Source: UNSD 2019
Tier II; Custodian agency: United Nations Office for Disaster Reduction (UNISDR)

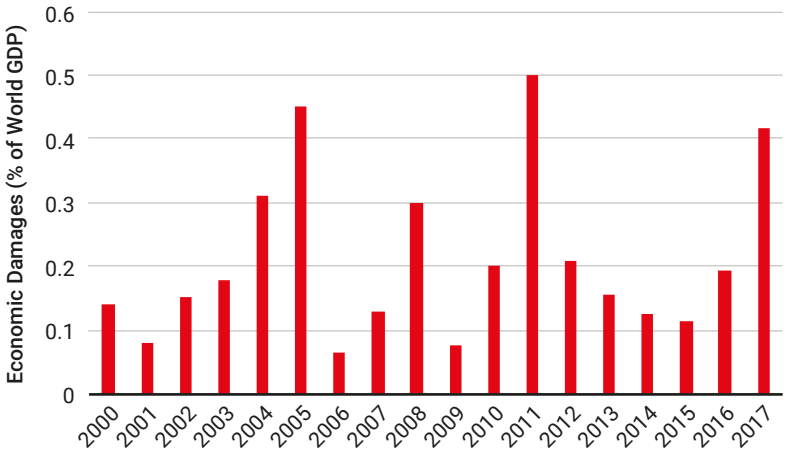
The risk of catastrophic damage from natural disasters, whether climate-related or geological (earthquakes, volcanoes, etc.), is a function of the vulnerability of a population combined with its exposure to hazard. Vulnerability to disasters can be reduced through ecosystem-based approaches to Disaster Risk Reduction and ecosystem-based adaptation, such as reforesting denuded slopes to reduce the risk of avalanches and landslides; through helping communities understand and prepare for potential environmental hazards in their region; or though many other measures. At a global scale, hazards are generally on a trend of being less devastating in terms of disaster-related mortality despite the growth in population size; however, there are still many challenges in terms of coping with disasters. More robust building standards, effective public awareness, and better preparedness on the part of the authorities have all contributed to the reduction in the death rates from natural disasters. An excellent example is Bangladesh, which in the past half century has experienced three category 6 cyclones. In 1970, the cyclone killed over 500,000 people whereas a similarly powerful cyclone in 1991 killed 140,000 people, and in 2007, the death toll from Cyclone Sidr, another 6-severe storm, was measured in the thousands (Haque *et al.* 2012).

Disasters: economic loss (SDG 1.5.2)

Very little negative or positive change

Direct economic loss attributed to disasters in relation to global gross domestic product (GDP).

Economic damages due to natural disaster



Source: UNSD 2019
Tier II; Custodian agency: United Nations Office for Disaster Risk Reduction (UNISDR)

The global picture hides considerable differences at the national level. Depending on both the inherent resilience and the size of the economy of a country affected by a natural disaster, the economic impact can vary dramatically. For example, natural disasters cost Bangladesh 1.72 per cent of its national GDP in 2016, more than four times as much of an impact as in neighboring India in the same year. In general, while human fatalities due to disasters are generally decreasing over time as a result of better early warning and preparedness, the economic costs of disaster are fluctuating quite significantly between 0.1 per cent and 0.5 per cent of global GDP. This is a result of more economic assets falling in harm's way as well as the increase in disaster insurance in certain places, coupled with the very variable nature and location of disasters that hit the globe from year to year.

Disasters: risk reduction strategies (SDG 1.5.3)

Too little data

Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030.

World Disaster Risk Reduction strategies in 2017

Source: UNSDR 2017
Tier I; Custodian agency: United Nations Office for Disaster Risk Reduction (UNISDR)

One of the most effective ways of institutionalising risk reduction in countries is through the adoption and implementation of appropriate disaster risk reduction strategies. The Sendai Framework on Disaster Risk Reduction, adopted by UN Member States in 2015, sets out the 'gold standard' for what these disaster risk reduction strategies should look like. Unfortunately, there is a lack of data for measuring "the number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030". Unlike most SDGs which set a target date of 2030, this target is to have universal adoption of national disaster risk reduction strategies by 2020. Based on the current information available, only a few countries have reported legislative or regulatory provisions in line with Sendai and the majority of countries do not have data available.

Disasters: risk reduction for local government (SDG 1.5.4)

Too little data

Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.

Source: UNISDR Day 2 - Third UN World Conference on Disaster Risk Reduction, 2015 (Flickr)
Tier II; Custodian agency: United Nations Office for Disaster Risk Reduction (UNISDR)

This indicator downscales the national level indicator on disaster risk management to a local scale by assessing the extent to which local governments are adopting and implementing local disaster risk reduction strategies in line with national disaster risk reduction strategies. The goal is to substantially increase the number of cities and human settlements adopting and implementing holistic disaster risk management at all levels. Unlike most SDGs which have a target year of 2030, this indicator is timed for 2020. Currently, it is not possible to gauge global progress towards this goal as not enough data on the uptake by local governments has been collected.

SDG 2: Food security

Sustainable agricultural practices (SDG 2.4.1)

No data available

Proportion of agricultural area under productive and sustainable agriculture.

Source: Peter Prokosch, 2014 (GRID-Arendal)
Tier II; Custodian agency: Food and Agriculture Organization (FAO)

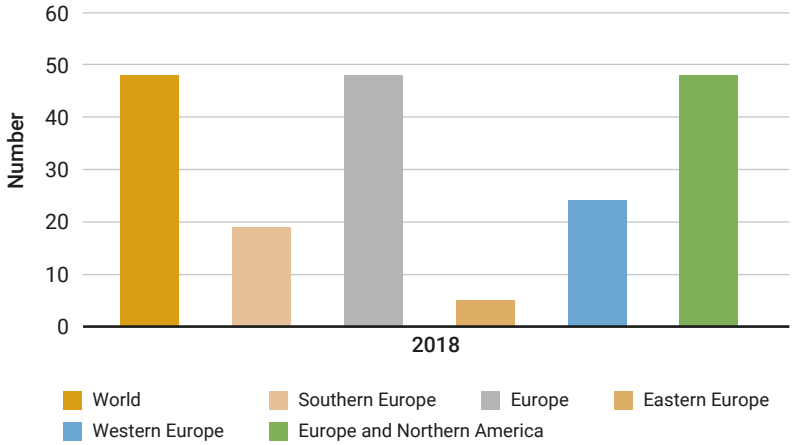
Agriculture is necessary to feed the world's growing population; however, it also adds pressure on natural resources, including water, forest, wetlands, and other ecosystems. In order to reduce the impact of agriculture on the environment while still providing food security, agricultural systems need to be more sustainable and equitable. The Food and Agriculture Organization of the United Nations (FAO) has identified five principles for sustainability in food and agriculture, including improving resource efficiency for sustainable agriculture, environmental protection, and conservation; promoting rural livelihoods, equity and well-being; building resilience through sustainable agriculture; and improving agricultural governance mechanisms (FAO 2014). Measuring the proportion of agricultural land that is being managed according to the principles of sustainable agriculture remains a challenge and there is a lack of information on sustainable agriculture in practice around the world.

Secure genetic resources for food (SDG 2.5.1)

Change in a positive direction

Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities.

Number of local breeds for which sufficient genetic resources are stored for reconstitution



Source: UNSD 2018
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

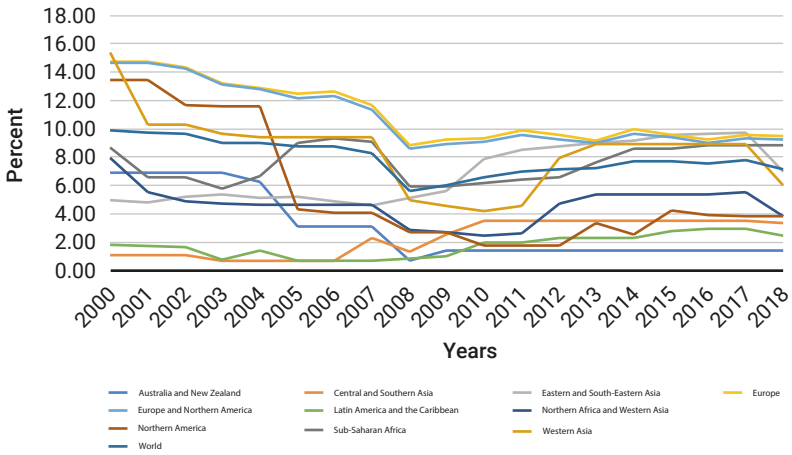
Genetic diversity is important for reducing vulnerability to plant disease, for climate change adaptation, for promoting nutrition, and for ensuring long-term agricultural productivity (FAO 2017). Current agricultural practices largely depend on wheat, maize, and rice in terms of crops and cattle, sheep, goat, pigs, and chicken in terms of livestock – these crops represent an estimated half of all calories consumed and these forms of livestock represent one-third of all protein consumed, globally (FAO 2017). In recent years, there has been a number of global efforts to ensure that genetic diversity is not lost by storing genetic resources. Currently, nearly half of local agricultural breeds have been stored for reconstitution. This represents a significant attempt to store genetic resources and to achieve this target. However, the storage of genetic resources is not consistent across regions. Eastern Europe is storing less than 10 per cent of genetic resources and no data are available for many parts of the world.

Local breeds for agriculture (SDG 2.5.2)

Very little negative or positive change

Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction.

Proportion of local breeds classified as known being not at risk



Source: UNSD 2018
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

Many local crops and livestock breeds are currently at risk of extinction across the planet. Many local crops and livestock have already become exinct in recent generations. FAO estimates a loss of three-quarters of all genetic diversity among crops since the 1900s (FAO 2017). Although the number of livestock and crops at risk of extinction has not greatly escalated in recent years, there is still a high number of crops and livestock at risk of exinction and, for many crops and livestock, there is no information to indicate the current risk of extinction. Climate change, invasive species, and environmental degradation may create further challenges in terms of protecting genetic resources.

SDG 3: Health

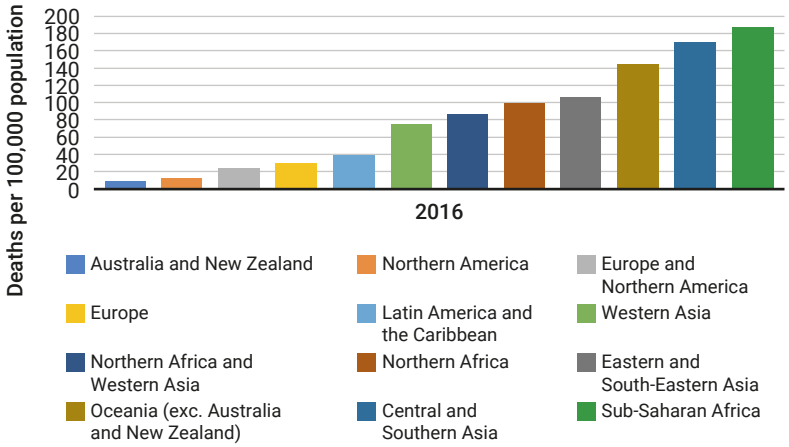
Rawpixel 2018

Air pollution mortality (3.9.1)

Too little data

Mortality rate attributed to household and ambient air pollution.

Age-standardized mortality rate attributed to household and ambient air pollution in 2016



Source: UNSD 2016
Tier I; Custodian agency: World Health Organization (WHO)

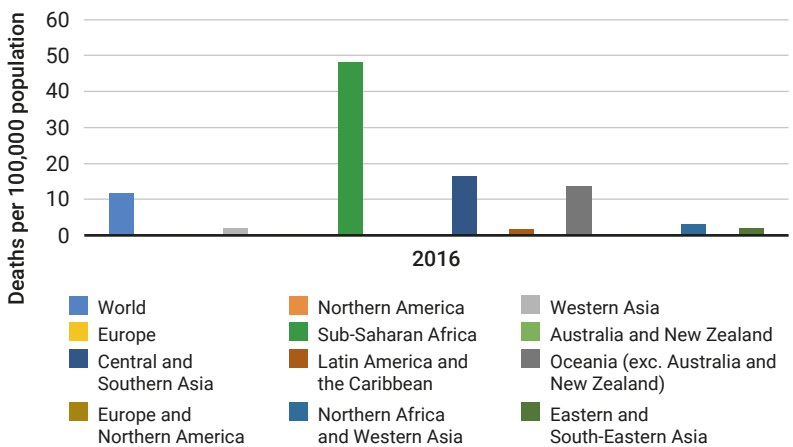
Despite an increasing recognition of the importance of air pollution, both indoor and outdoor air pollution continues to have serious impacts on human health. Specifically, air pollution has serious health impacts on non-communicable disease mortality (e.g. heart disease, stroke, and cancer) and acute lower respiratory infections. Indoor and outdoor air pollution caused an estimated 7 million deaths globally in 2016. The WHO estimated outdoor air pollution to have caused 4.2 million premature deaths worldwide in 2016, while a more recent study has estimated there are 8.9 million deaths each year attributed to outdoor particulate matter alone (Burnett *et al.* 2018). Some 91 per cent of those premature deaths occurred in low- and middle-income countries. In 2016, mortality rate attributed to air pollution was highest in Sub-Sahara Africa and central/southern Asia with 187 and 170 deaths per 100,000 population, respectively. Although sex-disaggregated data are not available for this indicator, there is a serious gender concern, especially for household air pollution. In many rural households in the developing world, women are the ones who perform cooking, and firewood and charcoal are the common energy source. On the other hand, outdoor air pollution has disproportionate impacts on young children, of whom women are often the caretakers.

Water-related mortality (3.9.2)

Too little data

Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services).

Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene



Source: UNSD 2016
Tier I; Custodian agency: World Health Organization

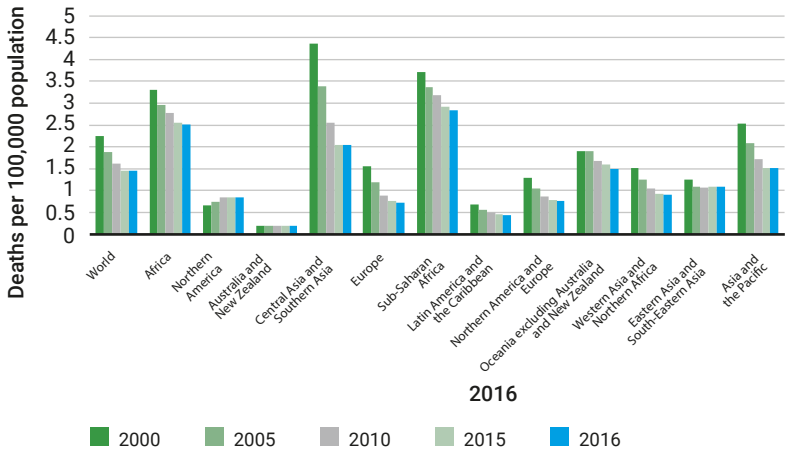
Unsafe drinking water, unsafe sanitation, and lack of hygiene are major risk factors for infectious diseases and continue to be major contributors to global mortality, resulting in about 870,000 deaths in 2016. These deaths were mainly caused by diarrheal diseases, but also from malnutrition and intestinal nematode infections. Deaths from inadequate water, sanitation and hygiene could be prevented by improving water, santiation and hygiene (WASH) services and practices. The mortality rate due to unsafe water, unsafe sanitation, and lack of hygiene relates to both the WASH service provision in the country, as well as the related health outcomes, and therefore provides important information on the actual disease caused by the risks measured in the SDGs targets on access to water (SDG target 6.1.1), access to sanitation (SDG target 6.2.1), and ambient water quality (SDG target 6.3.2) (UN 2018c). Globally, unsafe water, unsafe sanitation, and lack of hygiene causes 11.7 deaths per 100,000 population. Sub-Saharan Africa and Southern Asia are disproportionately affected. Death rates owing to the lack of WASH services in those two regions were 48.2 and 17.2 per 100,000 people, respectively, compared to 0.2 per 100,000 people in Europe and North America.

Unintentional poisoning (SDG 3.9.3)

Change in a positive direction

Mortality rate attributed to unintentional poisoning.

Mortality rate - unintentional poisonings (per 100,000 population)



Source: UNEP 2016
Tier I; Custodian agency: World Health Organization

Each year, hazardous chemicals and air, water, and soil pollution cause deaths and illnesses. In 2016, approximately 100,000 people died from unintentionally poisoning. Adequate management of hazardous chemicals and pollution is an important way to help avoid cases of accidental poisoning. Although good progress has been made since 2000 in reducing the death rate (i.e. mortality) of unintentional poisoning, there is still a substantial burden of disease associated with hazardous chemicals and environmental contamination. The number of people whose health is negatively impacted is not considered and, for others, the cause of death could not be traced back to unintentional poisoning. Unintentional poisoning can be caused by household chemicals, pesticides, kerosene, carbon monoxide, or can be the result of environmental pollution or occupational exposure. Regional differences are significant, with most cases occurring in Africa followed by Asia and the Pacific region. Globally, more men than women are affected (1.6 as opposed to 1.2 per 100,000 people in the population). Incorporating information about the safe use of chemicals in trainings and on visible posting of warnings and instructions on labels are important ways to further reduce mortality from environmental pollution related to this indicator.

SDG 4: Quality Education

Lawton 2017

Education for Sustainable Development (4.7.1)

No data available

Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment.

Source: Okinawa Institute of Science and Technology Graduate University, 2018 (Flickr)
Tier III; Custodian agency: UNESCO Institute of Statistics (UNESCO-UIS)

Environmental education is an important component of changing consumption patterns, promoting sustainable practices and lifestyles and improving environmental stewardship. A key element of this is to integrate environmental education in curricula at all levels. The Global Universities Partnership on Environment and Sustainability is an example of an initiative to improve environmental education. The Partnership currently has over 800 partner universities worldwide with a strong presence in the Global South. While there is still a lack of data on progress, the UNESCO 2018 Progress Report (United Nations Educational Scientific and Cultural Organization [UNESCO] 2018) reviewed current educational practices around the world and noted that there has been global progress towards implementation of the UNESCO Guiding Principles of the 1974 UNESCO Recommendation on Education (UNESCO 1974). New initiatives and political priorities are the most common enabling factors for implementing the Guiding Principles and a lack of resources is the greatest obstacle. The UN Decade on Education for Sustainable Development (2005-2014) and the ongoing Global Action Programme for Education for Sustainable Development have increased the momentum towards integrating environmental education into overall education principles (UNESCO 2017).

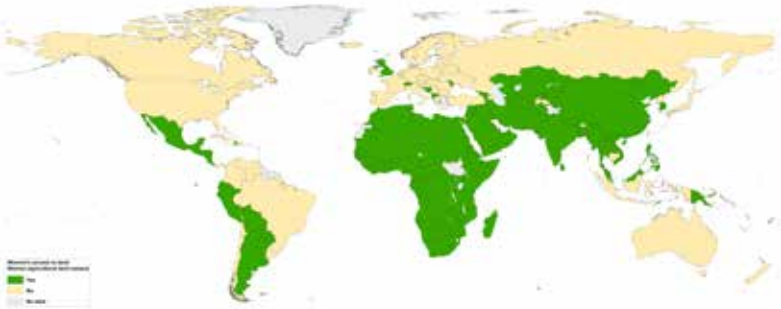
SDG 5: Gender

Women agricultural land owners (5.a.1)

No data available

(a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure.

Restricted resources and entitlements - woman access to land



Source: Landportal database (Land Portal 2014)
Tier II; Custodian agency: Food and Agriculture Organization (FAO)

The ability to own and manage agricultural land is essential for the social, economic, and political empowerment of women farmers. —Although women make up roughly half of those employed in the agricultural sector, they face particular inequalities regarding the right to own and control land. This impairs the ability of women to consider the longer-term sustainability of agricultural practices, pollution, and impacts of agriculture on the environment. Decreasing women's barriers in access to land and assets, in particular agricultural land, would provide a mechanism for better engaging populations in a dialogue on sustainable agricultural practices.

SDG 6: Water

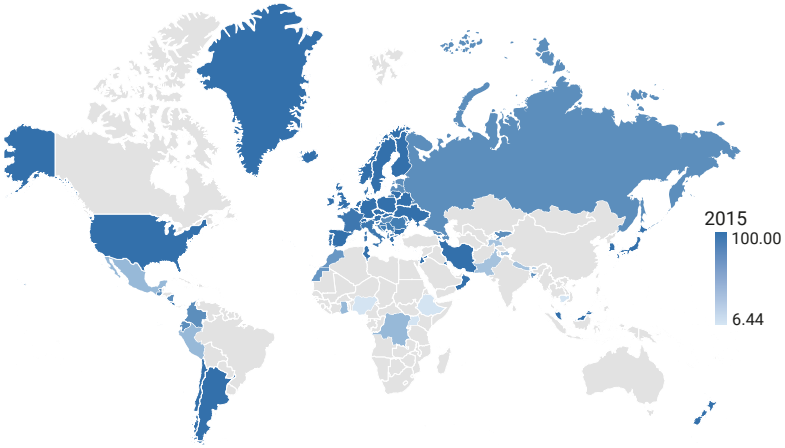
Doole 2017

Safe drinking water (SDG 6.1.1)

Change in a positive direction

Proportion of population using safely managed drinking water services.

Proportion of population using safely managed drinking water services (% of population)



Source: WHO and UNICEF – Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), 2017
Tier II; Custodian agency: World Health Organization (WHO) and United Nations Children's Fund (UNICEF)

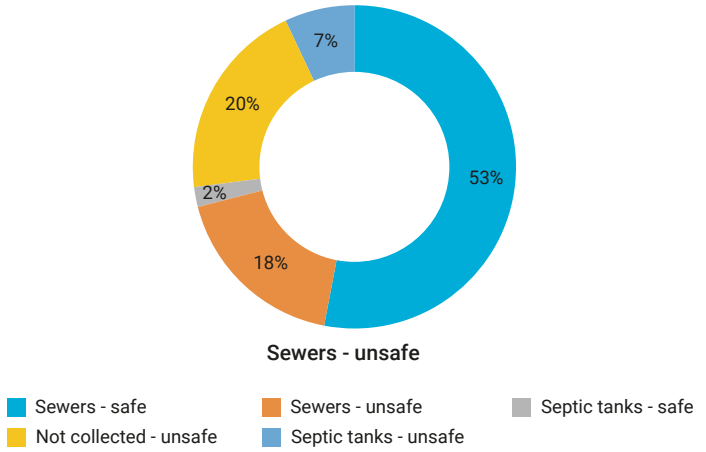
While many countries have widespread access to safe drinking water, there are still many parts of the world, that lack safe drinking water. A safely managed drinking water service is defined as the provision of drinking water from an improved source that is accessible on premises, available when needed and free from faecal and priority chemical contamination. Estimates for safely managed drinking water are currently only available for a subset of 96 countries and four SDGs regions. These vary widely from 94 percent in the Europe and Northern America region to 24 percent in the Sub-Saharan Africa region. There are still significant gaps in country-level systems for data collection, and further work is required to harmonise methods and standards. Most countries have data on whether services are accessible on premises, but relatively few have data on availability and quality of drinking water, particularly in rural areas and for populations using non-piped networks and private supplies. It is estimated that more than 150 million people worldwide, most of them in Sub-Saharan Africa, still use surface waters as their primary drinking water source, which are often the direct recipients of wastewater flows. There must be a concerted effort to strengthen national systems for monitoring safely managed drinking water services as technical innovations are reducing the cost of data collection.

Wastewater treatment (SDG 6.3.1)

No data available

Proportion of wastewater safely treated.

Domestic waste water treatment by type in 2010



Source: UN Water, World Health Organization (WHO) and UN-Habitat 2010
Tier II; Custodian agency: World Health Organization (WHO) and UN-Habitat

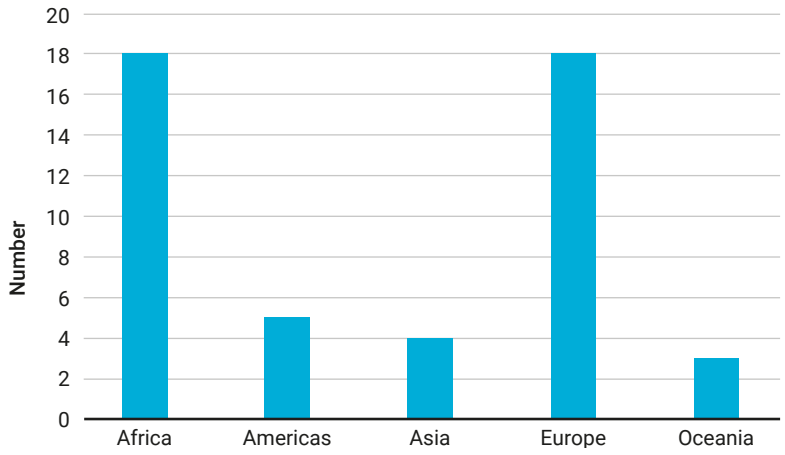
Only 59 per cent of domestic wastewater flow is collected and safely treated. The untreated 41 per cent poses risks to the environment and public health (World Health Organization [WHO] and United Nations Human Settlements Programme [UN-Habitat] 2018). The collection of wastewater includes 71 per cent collected in sewers, 9 per cent collected in on-site facilities, and 20 percent not collected. With regards to wastewater treatment, most (75 per cent) of the domestic wastewater flow collected in sewers is safely treated; however, only 18 per cent of domestic wastewater flow collected in septic tanks is safely treated. These estimates of domestic wastewater are based on 79 mostly high- and middle-income countries and exclude much of Asia and Africa. With regards to industrial wastewater, there is insufficient data available to estimate treatment of this stream that flows into sewers and directly into the environment. Data on industrial discharges is poorly monitored and seldom aggregated at the national level. One way to lessen the burden of reporting and help countries monitor the progress towards their commitment is to embed the agreed indicators in the national reporting for MEAs. Wastewater treatment recycle and reuse with current and appropriate technologies could ensure water security and support SDG 6.4 on water scarcity. Domestic and urban wastewater may be treated and be used in industrial applications.

Water quality (SDG 6.3.2)

Too little data

Proportion of bodies of water with good ambient water quality

Water quality data submitted by region



Source: UNEP and UNSD 2018
Tier II; Custodian agency: United Nations Environment Programme (UNEP)

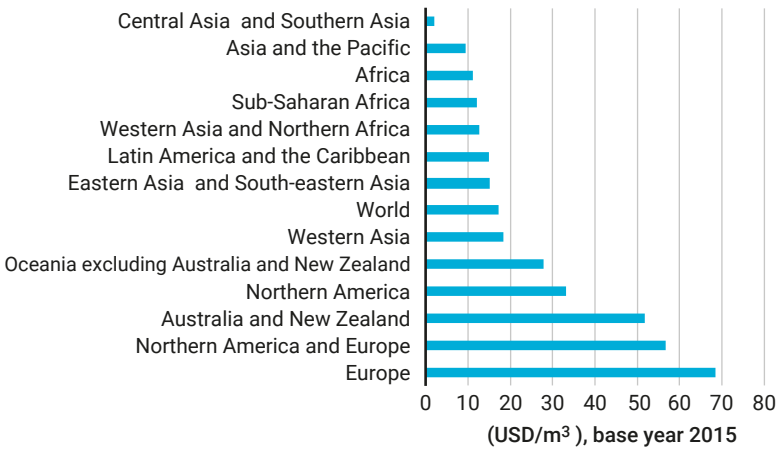
Adequate quality and quantity of water are necessary for achieving the SDGs for health, food security, and water security. Therefore, it is concerning that water pollution has worsened since the 1990s in a majority of rivers in Latin America, Africa, and Asia (UNEP 2016c). Reliable water quality monitoring data are required to assess the status and trends of water quality for human and ecosystem health, as well as to inform policymakers in taking appropriate decisions conducive to water resource protection and restoration, both in terms of water bodies and water-related ecosystems. However, there is a lack of data on freshwater quality. During the 2017 data drive, 52 Member States reported on their ambient water quality and some of the submissions had very few data points. The conclusions drawn from these assessments could be improved by incorporating data at higher spatial and temporal resolutions (UNEP 2018c).

Water efficiency (SDG 6.4.1)

No data available

Proportion of total water withdrawn for agriculture (%)

Water use efficiency by region ((USD/m^2), base year 2015



Source: FAO and UN-Water 2018
Tier II; Custodian agency

The agricultural sector is responsible for 69 per cent of all water used globally. Improving water efficiency, particularly in the agricultural sector, is an essential component of food and water security (Wallace 2000). Water-use efficiency is defined as the value added per unit of water used (FAO and United Nations Water [UN-Water] 2018). Most of the world is dependent on exploitation of their water resources to both generate economic growth and to provide food for the population. In general, countries with the highest proportion of water used for the agricultural sector also have the lowest water efficiency. The lowest water efficiency is found in Central Asia and Africa. As much of the world is facing water scarcity concerns, there is a need to promote sustainable agricultural practices towards reducing the inefficient use of water. There are many new techniques that have the possibility to reduce water intensity of agriculture. For example, water scarcity can be reduced by improving water-use efficiency and shifting economic activities to less water-intensive sectors.

Water stress (SDG 6.4.2)

Too little data

Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.

Levels of water stress by country (%) (2000–2015)

Source: FAO and International Water Management Institute (IWMI) 2015
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

The world's average water stress level stands at almost 13 percent with more than 2 billion people living in countries experiencing high levels of water stress. There are significant differences in water stress among countries and world regions that are hidden in global or regional aggregated assessments. Sub-Saharan Africa has a low level of water stress (3 percent), a figure that is not representative of the higher water stress levels found in the southern parts. For instance, South Africa has an average water stress level of 43 percent. Similarly, water stress values at the national level can conceal differences between wet and dry areas within a country. Estimates for the level of water stress are available for 171 countries and for all SDG regions. 32 countries experience water stress between 25 and 70 percent and 22 countries are above 70 percent. 11 countries are above 100 percent including Libya, Saudi Arabia, United Arab Emirates, Jordan, and Kuwait, where the demand for freshwater is largely being met by desalination. An analysis of trends in water stress for the past 20 years (1996–2016) shows that water stress levels have increased in most countries in the world. The likely causes are increased economic activities, growing populations, and improved ways to measure water usage, along with the effects of climatic changes.

Water resource management (SDG 6.5.1)

Too little data

Degree of integrated water resources management implementation (0-100).

Country implementation of integrated water resources management

Source: UN Water and UNEP 2018
Tier I; Custodian agency: United Nations Environment Programme (UNEP)

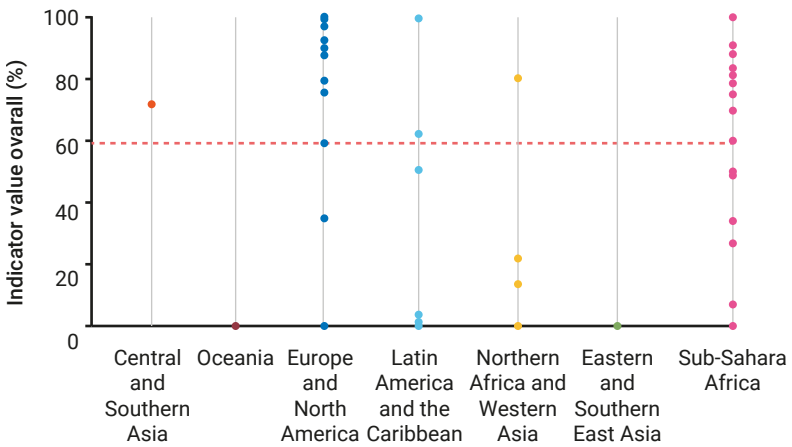
Eighty per cent of countries have laid the foundations for IWRM, but implementation needs to be accelerated to realise the 2030 Agenda. Integrated approaches help to coordinate sustainable development and water management for the full spectrum of users: residents in urban and rural areas, agriculture, industries, energy, and natural ecosystems. So far, 172 countries have reported on the global baseline for indicator 6.5.1, covering 30 aspects of water management, including policies and plans, institutions and stakeholder engagement, management instruments, and financing. The overall scores are categorised into six categories: 20 per cent of countries have started developing elements of IWRM ("very low" and "low" implementation), 40 per cent have institutionalised most elements of IWRM ("medium-low"), 20 per cent are generally implementing most elements of IWRM in long-term programmes ("medium-high"), and 20 per cent are generally achieving policy objectives ("very high" and "high" implementation). The 60 per cent of countries in the very low, low and medium-low categories are unlikely to meet the global target unless implementation is accelerated. Collective action that builds on the multi-stakeholder monitoring and reporting processes is needed to set national targets to accelerate water resources development and management in a sustainable and equitable way.

Water cooperation (SDG 6.5.2)

Too little data

Proportion of transboundary basin area with an operational arrangement for water cooperation.

Proportion of transboundary basin area with an operational arrangement for water cooperation in 2017/2018



Source: United Nations 2018
Tier I; Custodian agency: International Hydrological Programme of United Nations Educational, Scientific and Cultural Organization (UNESCO-IHP) and United Nations Economic Commission for Europe (UNECE)

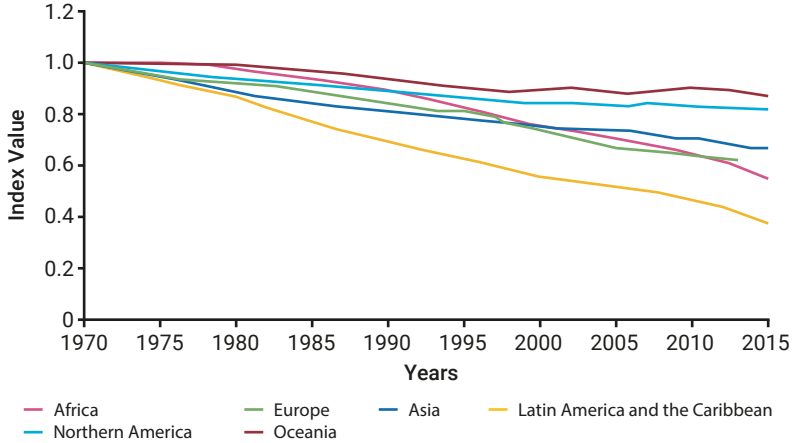
Any response to the global water crises and threats must account for the fact that 153 countries share transboundary riv¬ers, lakes, and aquifers. Transbound¬ary basins are home to over 2.8 billion people (42% of the world's population), cover 62 million km^2 of the land on Earth (42%), and account for 54% of global river discharge (UNEP 2016e). The lack of operational arrangements is a major bar¬rier to addressing the world's water crises. While an estimated 450 transboundary water treaties have been adopted since 1820, many transboundary rivers, lakes and aquifers lack the necessary arrangements to sup¬port their management (UN and UNESCO 2018). The average national percentage of transboundary basin area covered by an operational arrangement is 59% in the period 2017-2018 for countries with data available. Globally, only 17 countries have all their transboundary basins covered by operational arrangements. In the Sub-Saharan Africa region, out of 20 countries reported, 12 show at least 70% of their transboundary basins covered by operational arrangement. 10 out of 27 countries reported having operational arrangements in place for all their transboundary river and lake basins. For aquifers, six countries report that operational arrangements are in place for more than 70% (UN and UNESCO 2018). Operational arrangements are absent in many basins in Northern Africa, Asia, and Latin America and the Caribbean.

Water related ecosystems (SDG 6.6.1)

Very little negative or positive change

Change in the extent of water-related ecosystems over time.

Wetland extent trend index



Source: UNEP-WCMC 2015
Tier I; Custodian agency: United Nations Environment Programme (UNEP)

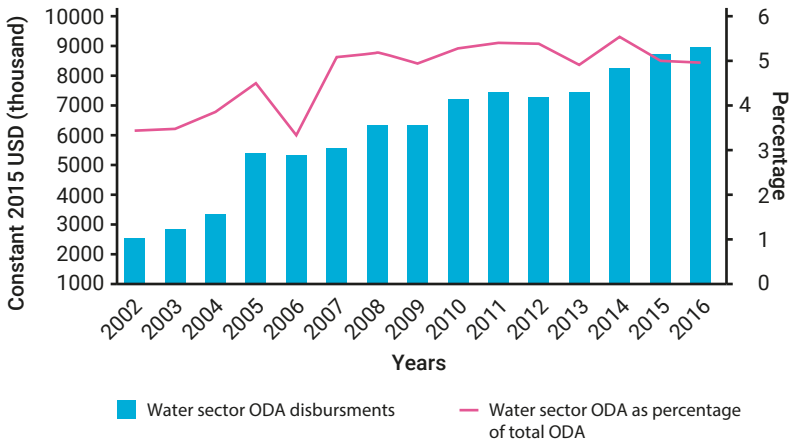
Natural water bodies have been decreasing, and artificial water bodies (e.g. reservoirs, dams, and rice paddies) have been increasing in most regions of the world. The loss in natural wetland, from a historic reference, is estimated as 42 percent in Africa, 32 percent in Asia, 35 percent in Europe, 59 percent in Latin America and the Caribbean, 17 percent in North America, and 12 percent in Oceania. The world has lost 70 percent of its natural wetland extent, including a significant loss of freshwater species, over the last 100 years. Protecting and restoring water-related ecosystems is essential to ensure they continue to provide sustainable social and economic services and benefits to society. This is important for all water-related ecosystems such as vegetated wetlands, rivers, lakes, reservoirs and aquifers, and those found in mountains and forests that play a special role in storing freshwater and maintaining water quality. Of the 193 countries invited to provide data on their water-related ecosystems, 40 countries submitted data addressing at least one sub-indicator for indicator 6.6.1. With only 20 per cent of UN Member States providing data, progress on reporting on indicator 6.6.1 data is low. Future reporting on this indicator will take advantage of available data from remote sensing and satellites to fill gaps.

Investment in water and sanitation (SDG 6.a.1)

Change in a positive direction

Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan.

Annual water sector ODA disbursement (thousands of constant 2016 US$), and water sector ODA as a percentage of total ODA



Source: OECD 2016
Tier I; Custodian agency: World Health Organization (WHO), United Nations Environment Programme (UNEP) and Organisation for Economic Co-operation and Development (OECD)

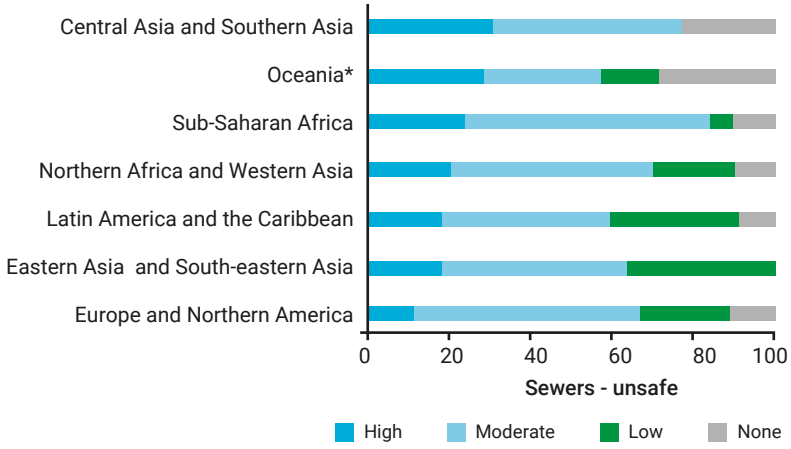
Hundreds of billions of dollars still need to be raised to fund the implementation of SDG 6, which is expected to generate socioeconomic and health benefits that greatly exceed the cost of doing so. This calls for increased mobilisation of domestic funds and a significant scaling-up of external support to cover interim gaps where national capacity and resources are under development. Investments in the water sector need to be supported by sustainable business models and alternative financial mechanisms such as blended finance, loans, and revolving funds. Total water sector overseas development assistance (ODA) data show that disbursements increased from US$7.4 billion to US$9.0 billion between 2011 and 2016. Funding has increased across the sector since 2005, with aid for agricultural water resources nearly tripling. There is some evidence that ODA commitments to water and sanitation have declined since 2012, particularly in Sub-Saharan Africa, indicating uncertainty in future investments. Basic drinking water and sanitation systems accounted for nearly a quarter (22 percent) of total ODA disbursements in Sub-Saharan Africa. ODA for large drinking water and sanitation systems remained steady as a proportion of total ODA disbursements from 2011 to 2016, at approximately 40 percent.

Local water management (SDG 6.b.1)

Too little data

Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management.

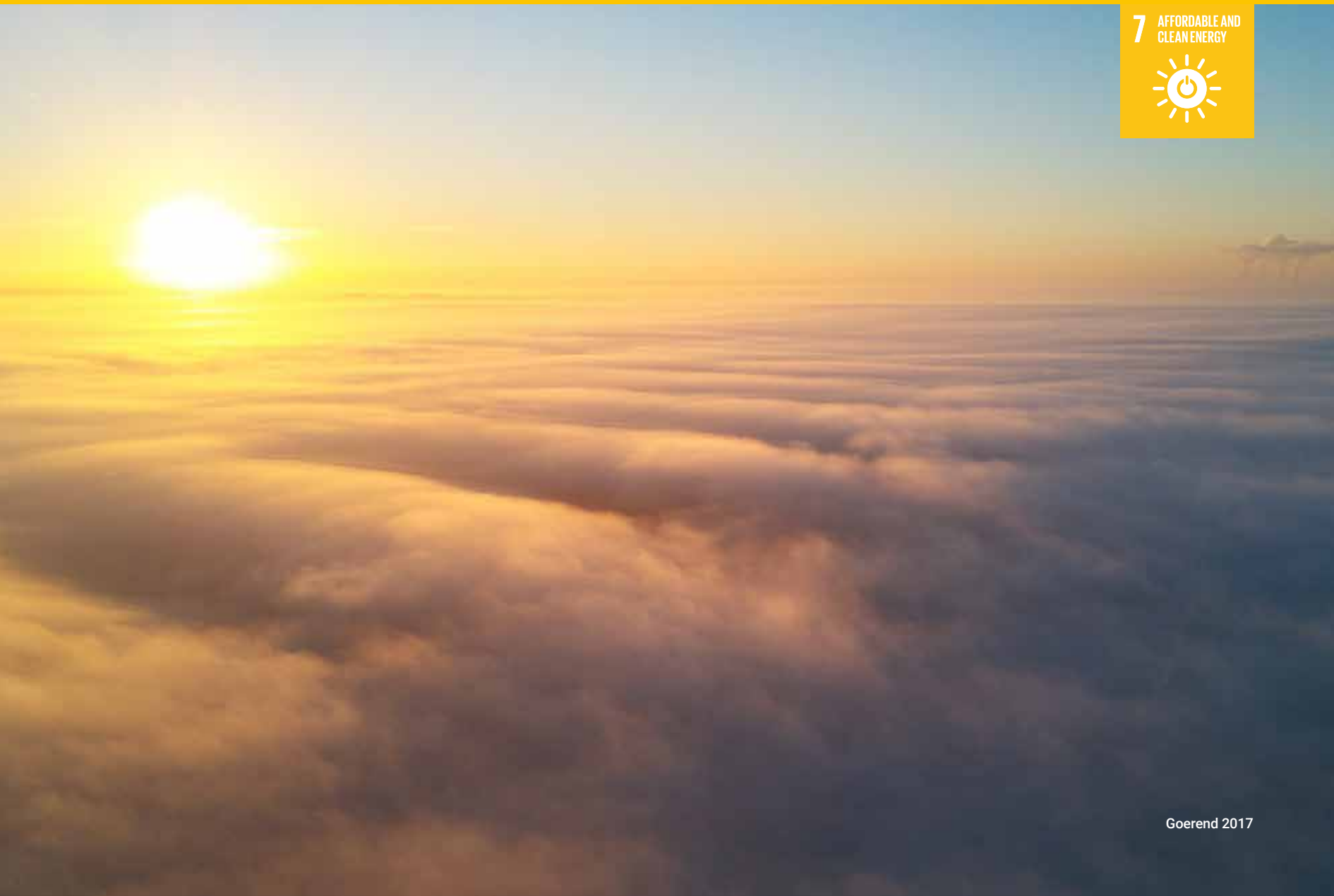
Percentages of countries with low, moderate, high and no levels of participation by SDG region (rural drinking water supply)



Source: WHO 2018
Tier I; Custodian agency: World Health Organization (WHO), United Nations Environment Programme (UNEP) and Organisation for Economic Co-operation and Development (OECD)

Community participation is a key component of increasing sustainable WASH service provision, particularly in rural areas and for promoting IRWM. Achieving this can contribute towards increased partic¬ipation of women in political, economic and public life. It can also contribute towards ensuring conservation, restoration, and sustainable use of freshwater ecosystems and their services and ensuring responsive, inclusive, participatory, and representative decision-making at all levels. Over 75 percent of countries report having clearly defined policies and procedures in place for the participation of service users and communities in planning programmes for drinking water supply (urban: 79 percent, rural: 85 percent) and sanitation (urban: 79 percent, rural: 81 percent). Levels of participation remain comparatively low despite most countries reporting having clearly defined procedures for local participation. Less than 25 percent of countries report a high level of participation in any subsector. Levels of participation tend to be higher for drinking water supply (22 percent) and sanitation (21 percent) in rural areas compared to urban areas (13 percent and 9 percent, respectively). Rural drinking water supply tends to have the highest proportion of countries with defined procedures for participation, among the four subsectors, and urban sanitation has the lowest.

SDG 7: Energy



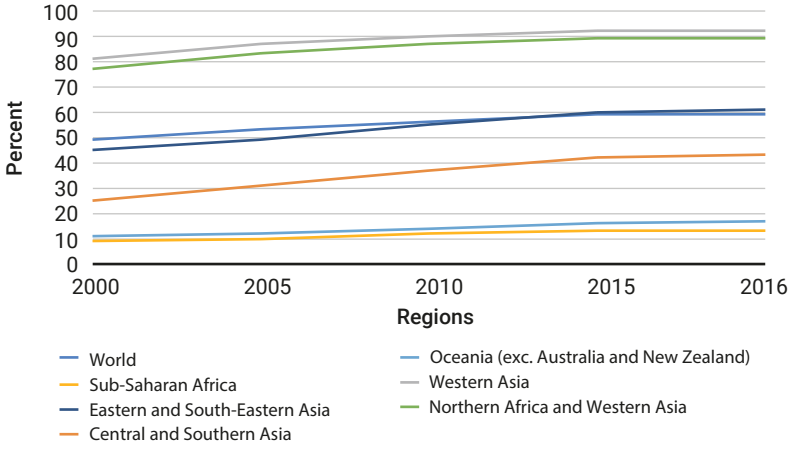
Goerend 2017

Reliance on clean fuels (SDG 7.1.2)

Change in a positive direction

Proportion of population with primary reliance on clean fuels and technology.

Proportion of population with primary reliance on clean fuels and technology (%)



Source: UNSD 2016
Tier I; Custodian agency: World Health Organization (WHO)

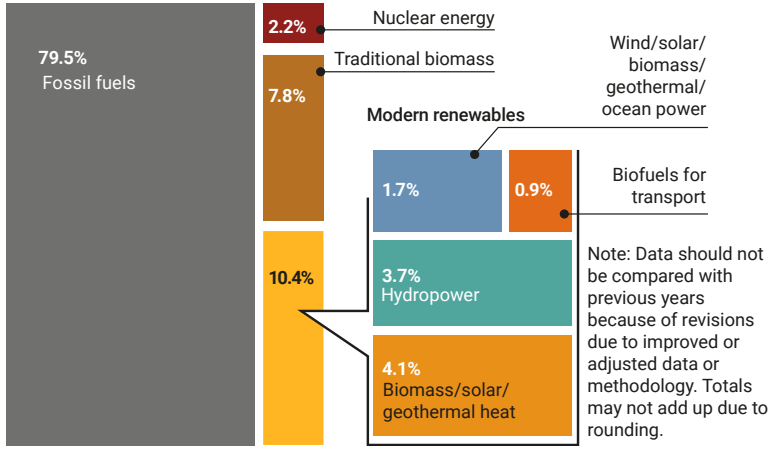
Globally, 62 per cent of people had access to clean cooking facilities in 2017. Clean cooking facilities are important for reducing indoor air pollution and related health complications. It also reduces the unpaid time burden of people – mostly women – in collecting firewood, as improved cookstoves consume less fuel. In developing countries, there remains a lack of access to clean cooking facilities and an estimated 50 per cent of people live without access to clean cooking facilities, two thirds of which live in Asia and 30 per cent in Sub-Saharan Africa (Organisation for Economic Co-operation and Development [OECD] and International Energy Agency [IEA] 2017). Clean cookstoves made up 83 per cent of cookstoves distributed, with two-thirds of all clean cookstoves being distributed in India. The number of distributed cookstoves has more than tripled from 2015 to 2016.

Renewable energy (SDG 7.2.1)

Very little negative or positive change

Renewable energy share in the total final energy consumption.

Estimated renewable share of total final energy consumption, 2016



Source: Renewables 2018 Global Status Report and International Energy Agency (IEA)
Tier I; Custodian agency: International Energy Agency (IEA), United Nations Statistics Division (UNSD), United Nations' inter-agency Mechanism on Energy (UN Energy) and International Renewable Energy Agency (IRENA)

The share of modern renewable energy in total final energy consumption has been growing over the past years; however, there is still a high reliance on fossil fuels. World energy consumption and related greenhouse gas and air pollution emissions continued to rise to an all-time high in 2017, driven by increased fossil fuel consumption, particularly in fast-growing economies. The combined share of renewable energy in 2016 accounted for 18.2 per cent of the total final energy consumption, 10.4 per cent of which was modern renewable energy. The greatest portion of this share was accounted by renewable electricity, primarily hydropower at 3.7 per cent. Renewable thermal energy provided by modern biomass, solar thermal heat, and geothermal heat accounted for 4.1 per cent of total final energy consumption, while biofuels for transport was slightly under 1 per cent of total final energy consumption. Traditional biomass accounted for 7.8 per cent of total final energy consumption, which was used primarily for heating and cooking in developing countries. Technological advancements in wind turbine and solar photovoltaic systems have enabled a per unit productivity increase of a factor of more than 10 over the past 20 years. Renewable electricity accounted for more than half of global electricity capacity additions over the past five years.

Energy intensity (SDG 7.3.1)

Change in a positive direction

Energy intensity measured in terms of primary energy and GDP.

Primary energy intensity in 2015 (MJ/2011 $US PPP)

Source: IEA, World Development Indicators (WDI) and UNSD 2015
Tier I; Custodian agency: International Energy Agency (IEA), United Nations Statistics Division (UNSD) and United Nations' Inter-Agency Mechanism on Energy (UN Energy)

Global energy demand grew at its fastest rate since 2013 and increases in coal, oil and gas consumption continued in 2017, with the electricity and transport sectors representing the largest usage (IEA *et al.* 2018). Global electricity demand continued to rise and will more than double in developing and emerging economies by 2030 due to economic development, higher disposable incomes, and more affordable electrical products. Global energy intensity – the ratio of energy used per unit of GDP - continued to fall at a slightly faster pace than the SDGs baseline year 2010 rate of 1.3%, with a global rate of energy efficiency improvement of 1.7% in 2017; however, this rate was down from the 2015 rate of 2.8% and was also below the average annual improvement rate of 2.2% since 2010. A much faster global decoupling of energy demand from economic growth is required to reach the SDG target of an average annual decline of 2.6%. However, this is achievable as shown by Chinese energy intensity falling by 3.9% in 2017 compared to around 1.2% in the rest of the world. Technology and affordability are key drivers for energy efficiency improvement but intensifying sustainable energy policy measures is important to promote faster and sustained global application of better standards, best practice energy system replication and the global adoption of widely available, clean, and efficient technologies.

Clean energy research and technology (SDG 7.a.1)

No data available

Mobilised amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment.

Source: Windwärts Energie, 2010 (Flickr)
Tier II; Custodian agency: Organisation for Economic Co-operation and Development (OECD) and International Renewable Energy Agency (IRENA)

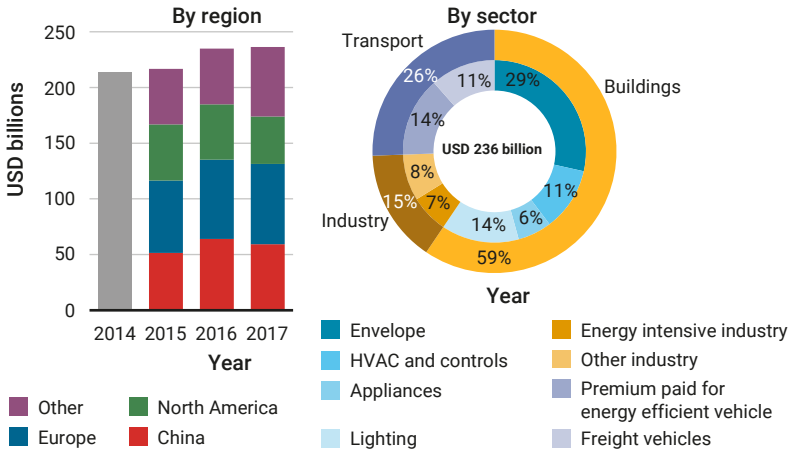
International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems, is important for achieving the 2030 Agenda. For this indicator, which has no established methodology or systematic tracking, the goal is to enhance international cooperation to facilitate access to clean energy research and technology (including renewable energy, energy efficiency, and advanced and cleaner fossil-fuel technology) and promote investment in energy infrastructure and clean energy technology by 2030. The indicator also covers cooperation in the field of nuclear fusion, hydrogen, and fuel cells technology. Globally, investment in research and development in renewable energy set a record high in 2017, rising six per cent to $9.9 billion (Frankfurt School of Finance & Management [FSFM] 2018). The increase was entirely driven by corporate R&D, which rose 12 per cent to $4.8 billion, while government spending remained unchanged at $5.1 billion. Solar gained a 6 per cent increase to $4.7 billion; wind rose 6 per cent to $1.9 billion, a new high; and biofuels increased by 2 per cent to $1.7 billion. Biomass and waste gained 10 per cent to $918 million.

Investment in energy efficiency (SDG 7.b.1)

No data available

Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services.

Energy efficiency investment by sector and region



Source: IEA 2017
Tier III; Custodian agency: International Energy Agency (IEA)

Global investment in energy efficiency is not yet on track to achieve the scale required. Average annual demand side efficiency investment must grow to $584 billion between now and 2025, and then to nearly $1.3 trillion per year between 2026 and 2040. Demand side global energy efficiency investment grew marginally in 2017, up by 3% from 2016 to $236 billion (IEA 2018a). Europe continues to see the most energy efficiency investment at $75 billion, 32% of the global total. North America accounted for 18% of investment, at $42 billion, and China's share of total investment was 27%. The buildings sector hit $140 billion (59 of the global total) in 2017, a 3% increase from 2016. Transport sector investment grew the most, up by 11% to $60 billion. Industry sector investment fell by 8% to $35 billion in 2017. Dollar investment in new renewable power capacity (including all hydropower) was triple the investment in fossil fuel generating capacity, and more than double the investment in fossil fuel and nuclear power generation combined in 2017 (Renewable Energy Policy Network for the 21st Century [REN21] 2018). Developing and emerging economies overtook developed countries in renewable energy investment for the first time in 2015 and extended their lead in 2017, accounting for a record 63% of the global total, largely due to China.

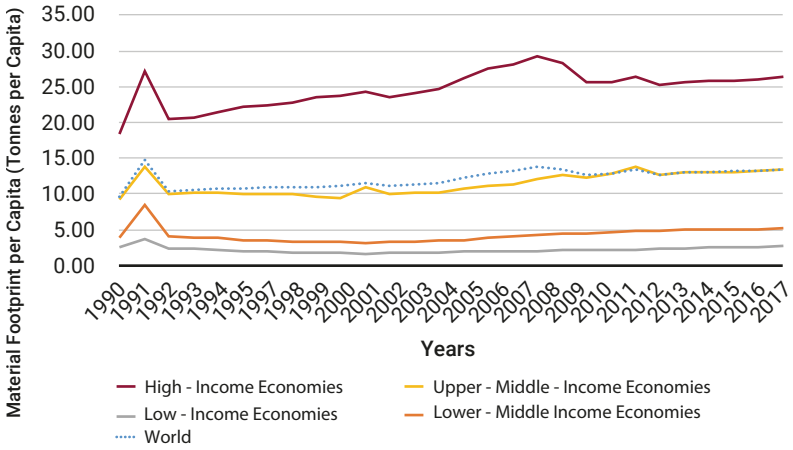
SDG 8: Decent work and economic growth

Material footprint (SDG 8.4.1)

Change in a negative direction

Material footprint, material footprint per capita, and material footprint per GDP.

Material footprint per capita by four national income bands, with World average, 1970 – 2017, and ratio of high-Income group to World total.



Source: UNEP and International resource Panel (IRP) 2018
Tier III; Custodian agency: United Nations Environment Programme (UNEP)

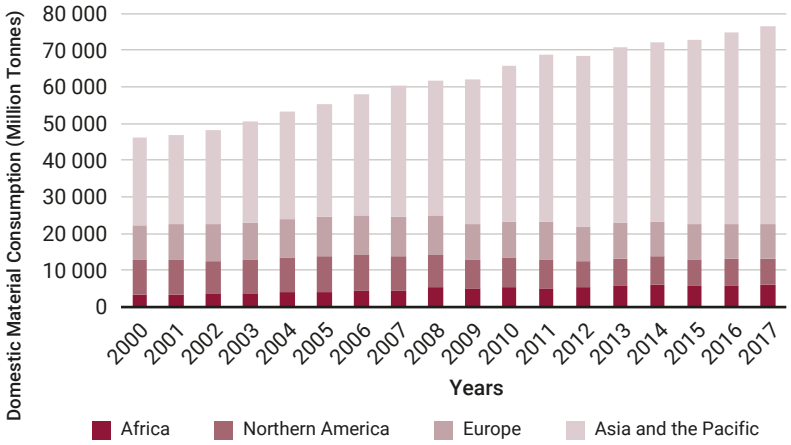
The share of the material footprint attributed to high-income regions is much higher compared to their domestic material consumption. In 2017, high-income countries had the highest per capita material footprint consumption at approximately 27 tons, 60 per cent higher than the upper-middle income group and more than 13 times the level of the low-income group (at only 2 tons per capita) (Bringezu *et al.* 2019). The gross material footprint of the upper-middle income group did not exceed that of the high-income group until the global financial crisis, and in 2017 the high-income group still accounted for over 35 per cent of global material footprint. Per capita impacts of consumption in high-income regions are between three and six times larger than those of low-income regions. This is due partly because of trade. Some high-income regions import resources and materials and outsource production-related environmental impacts to middle- and low-income regions. At the same time, the value created through these traded materials in the countries of origin is relatively low. From 1970 to 2017, there has not been a global level of wealth at which the material demand has stabilised or declined.

Domestic material consumption (SDG 8.4.2)

Change in a negative direction

Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.

Domestic Material Consumption Per Capita By Income Group



Source: UNEP 2017
Tier I; Custodian agency: United Nations Environment Programme (UNEP)

Total global resource extraction of resources grew from 27.1 billion tons in 1970 to 92.1 billion tons in 2017. Ten economies are responsible for over 68% of global extraction in 2017, compared to around 64% in 1970 (Bringezu *et al.* 2019). Domestic material consumption (DMC) patterns have rapidly changed over the past 50 years. In 1970, Asia and the Pacific accounted for 25% of the global total DMC, Europe accounted for 24% and North America for 22%. By 2017, Asia and the Pacific accounted for 60% of global DMC, while Europe and North America combined accounted for 18%. Upper-middle income economies share of global DMC is increasing (from 33% in 1970 to 56% in 2017), while the share of high-income countries is rapidly decreasing (from 52% in 1970 to 22% in 2017). This can be explained by the demand of materials to build up new infrastructure, especially in developing and emerging economies; and the outsourcing of materials and energy-intensive stages of production. In the last 50 years, the global share of DMC of low-income countries has remained unchanged at below 3%, despite having the highest population growth rate. This shows that the massive growth in materials consumption has not gone to the poorest countries, the group in most urgent need of higher material living standards.

Employment in sustainable tourism (SDG 8.9.2)

No data available

Number of jobs in tourism industries as a proportion of total jobs and growth rate of jobs, by sex.

Source: Non-profit organization Condor Trekkers touring in Sucre, Bolivia (Flickr, Condor Trekkers 2015)
Tier III; Custodian agency: World Tourism Organization (UNWTO)

One out of ten jobs are supported by travel and tourism (World Travel & Tourism Council [WTTC] 2018). Promoting sustainable tourism is essential for ensuring long-term sustainable economic opportunities and for protecting the planet. However, defining and measuring tourism sustainability is currently not feasible and tracking the overall employment and economic growth from tourism at large does not provide a complete picture (World Tourism Organization [UNWTO] and United Nations Development Programme [UNDP] 2017). Currently, tourism GDP and employment in the tourism industries are being promoted as measures on the economic dimension of tourism and, to some extent, the social dimension; however, there is a dearth of information on the environmental sustainability of the tourism sector. There is a need for additional information on the contribution of tourism towards the achievement of the SDGs, which can offer an integrated, coherent, and robust information base for sustainable tourism policies.

SDG 9: Industry, Innovation and Infrastructure

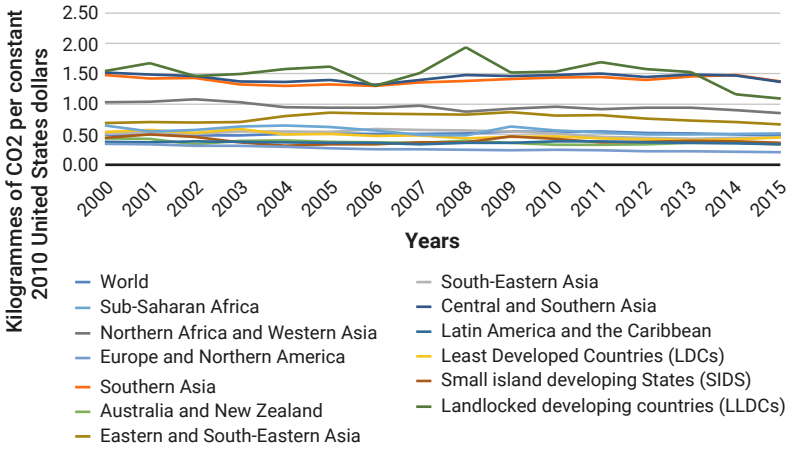
Ishan 2017

CO_2 Emissions (SDG 9.4.1)

Very little negative or positive change

CO_2 emission per unit of value added.

Carbon dioxide emissions per unit of manufacturing value added



Source: UNSD 2015
Tier I; Custodian agency: International Energy Agency (IEA) and United Nations Industrial Development Organization (UNIDO)

Improvements in energy efficiency and infrastructure could help reduce CO_2 emissions and material use per unit of value added, but they are not likely to be enough as production volume grows (United Nations Industrial Development Organization [UNIDO] 2017). Global energy intensity in manufacturing decreased by an average annual rate of 1.3 per cent between 1990 and 2014. The share of renewable energy in the manufacturing sector was seven per cent in 2010 (IEA 2018b). The Asia and Pacific region has dominated global manufacturing production since 2002, covering almost half of global manufacturing production in 2016. Eastern and South Eastern Asia had the highest consumption of energy and produced 3.3Gt of CO_2 in the manufacturing sector, accounting for more than 50 per cent of manufacturing emissions (IEA 2018). Energy intensity fell 44 per cent in Central and South Asia. India was the most energy-intensive manufacturing economy in 2014. To maintain sustainable growth, economies need to produce and consume environmental goods more efficiently, generating less waste. A new production paradigm is needed to shift towards renewable energy and reduce the use of natural resources. In a circular economy, products would be designed for durability, reuse, and recyclability, and materials for new products would come from old products (UNIDO 2018).

SDG 11: Cities and communities

The Roaming Platypus 2017

Access to public transport (SDG 11.2.1)

No data available

Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities.

Source: MunichTramSpotter, 2017 (Flickr)
Tier II; Custodian agency: United Nations Human Settlements Programme (UN-Habitat)

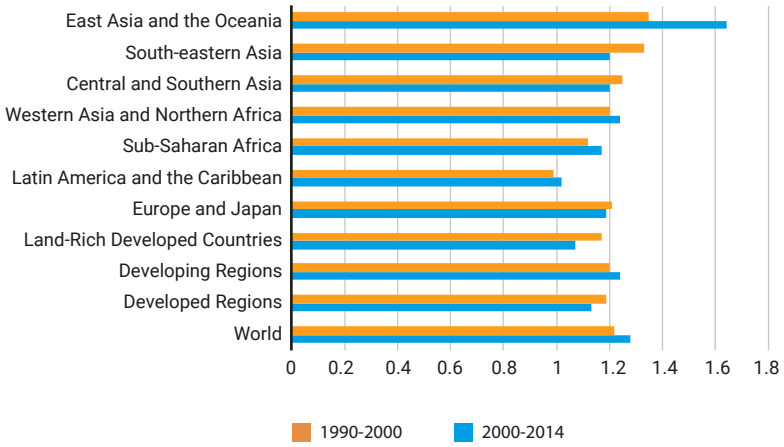
Access to public transportation has a direct impact on environment and people. Providing convenient access to public transport - including access to inland waterways transportation in some countries - helps to reduce transport emissions and reduce deaths related to outdoor air pollution. Public transportation also reduces the deaths related to road traffic accidents as well as heavy traffic jams in cities. The increased usage of public transportation by the population has a positive impact on the economy. Additionally, insufficient mobility is linked with social exclusion, poverty, and lack of econoimc opportunities (Schwanen *et al.* 2015)[lxxxi]. There is currently a lack of data and information on the access to public transportation at the global level.

Land consumption (SDG 11.3.1)

No data available

Ratio of land consumption rate to population growth rate.

Ratio of rate of urban extent growth rate to population growth rate by region



Source: UNEP 2014
Tier II; Custodian agency: United Nations Human Settlements Programme (UN-Habitat)

Recent data on this indicator depicts a sprawling world in which cities and other urban settlements are rapidly expanding and significantly changing the natural and urban environments. Empirical studies of global settlement patterns consistently point towards declining urban densities, which are characteristic of more growth in low density suburbs outside urban cores (UN-Habitat 2018b). For example, based on time series data collected in 200 representative cities over the periods 1990-2000 and 2000-2014, the average global rate of physical expansion of cities was about 1.2 times their rate of population growth (Angel *et al.* 2016). This trend was consistent in all regions other than the Latin America and Caribbean region, whose rate of population growth was faster than that of urban expansion for the 1990–2000 period. As expected, the rates of change in urban land consumption vary significantly across regions, with faster growth recorded in the developing regions. The key outcomes of the recorded fast rates of urban sprawl include, among others, inefficient land use, which negatively impacts the environment, increased costs of providing basic services to populations, increased demand for and use of energy, challenges associated with waste management, and growth in the number of unplanned settlements, some of which are located in environmentally sensitive areas.

Urban planning (SDG 11.3.2)

No data available

Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically.

Source: Robbert van der Steeg, 2011 (Flickr)
Tier II; Custodian agency: United Nations Human Settlements Programme (UN-Habitat)

Good urban governance forms the foundation for efficient and sustainable city planning. Participatory approaches towards urban planning ensure that the needs of populations are considered and that communities will contribute to the sustainability of cities. Accountability, transparency, participation, and inclusion are considered to be the foundation for local and national level public administration and action; however, there are often gaps in terms of who is able to participate and be included in the process (Carothers and Brechenmacher 2014). The implementation of this indicator underpins how urban planning processes can be developed in a way that will support city-level achievement of the SDGs and forms a foundation for ensuring accountability, transparency, participation, and inclusion.

Investment in cultural and natural heritage (SDG 11.4.1)

No data available

Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship).

Source: Catherine Bulinski, 2011 (Flickr)
Tier III; Custodian agency: UNESCO Institute for Statistics (UNESCO-UIS)

Culture is the basis for how people live their lives and interact with the environment (Duxbury, Hosagrahar and Pascual 2016). No sustainable development process can underestimate the importance of culture and heritage of the communities. Investing in cultural and natural heritage is a foundation for ensuring that citizens are engaged in development and appreciate their natural environment. There is little information related to the preservation of heritage and thus there is a need to improve cultural statistics. In 2009, a Framework for Cultural Statistics was adopted which provides a basis for measuring culture and interactions between culture and development (UNESCO 2009). “Cultural matters are integral parts of the lives we lead. If development can be seen as enhancement of our living standards, then efforts geared to development can hardly ignore the world of culture” (Amartya Sen). Many corporations are making efforts to maintain art, culture, and tradition as part of their corporate social responsibility initiatives.

Disasters: persons affected (SDG 11.5.1)

Change in a positive direction Change in a negative direction

Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population.

Source: Ginsu 2016

This indicator is described under SDG 1.5.1. Tier II

Disasters: economic loss (SDG 11.5.2)

Very little negative or positive change

Direct economic loss attributed to disasters in relation to global gross domestic product (GDP).

Source: Asian Development Bank, 2005 (Flickr)
Tier II; Custodian agency: United Nations Office for Disaster Reduction (UNISDR)

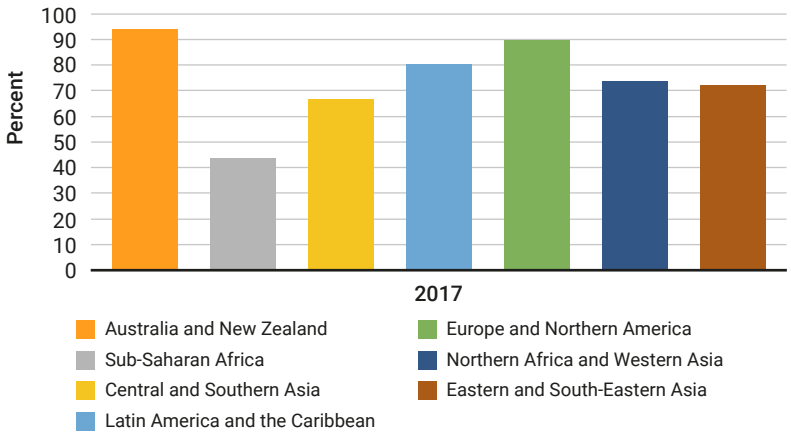
This indicator is described under SDG 1.5.2.

Urban solid waste management (SDG 11.6.1)

Too little data

Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities.

Municipal solid waste collection coverage, by cities



Source: UNSD 2017
Tier II; Custodian agency: United Nations Human Settlements Programme (UN-Habitat)

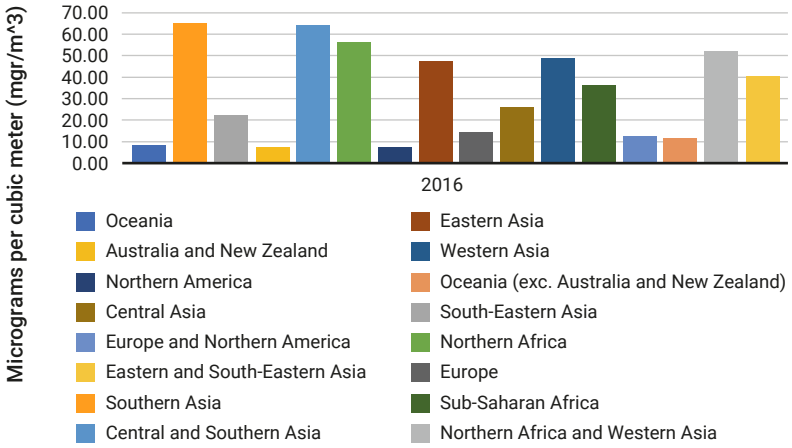
With rising populations and rapid urbanisation trends, the production of urban solid waste has continued to increase in recent years, with waste management services needing upgrading and investment. Disposal of urban solid waste is a major problem despite the fact that many technologies and effective management are available. Composting, recycling, and biomass gasification together provide enough technology for the disposal of urban solid wastes. High-income regions such as Europe and North America have reached municipal waste collection coverage levels of around 90 per cent, middle- and lower-middle income regions such as Latin America and Asia have reached between 65 and 80 per cent of their cities, while Sub-Saharan Africa faces the greatest challenges and remains below 50 per cent coverage levels for municipal solid waste collection. In terms of measuring SDG indicator 11.6.1 as it is defined, there are some difficultities in defining "urban" as well as "adequate final discharge". With regard to data availability, data for municipal solid waste regularly collected is available for many, if not most, major cities worldwide as the increased prevalence of private sector subcontractors and their use of weighbridges to keep track of quantities of waste collected facilitates data gathering.

Ambient air pollution (SDG 11.6.2)

Too little data

Annual mean levels of fine particulate matter (e.g. $PM_{2.5}$ and PM_{10}) in cities (population weighted).

Annual mean levels of fine particulate matter in cities, urban population



Source: UNSD 2016
Tier I; Custodian agency: World Health Organization (WHO)

Particulate matter (PM), including extremely small dust and soot particles, is a leading risk factor of health, mainly for respiratory and cardiovascular diseases. The WHO Air Quality Guidelines recommends an annual mean concentration of 10 ug/m^3 for fine particulate matter smaller or equal to 2.5 micrometers (um) in diameter ($PM_{2.5}$) (WHO 2006). In 2016, the world average population-weighted annual mean levels of $PM_{2.5}$ was estimated to be 40 ug/m^3, based on modelled data. Globally, 91 per cent of the population is living in places where particulate matter levels are above the WHO Air Quality Guidelines value. Southern Asian (64 ug/m^3) and Northern African (55 ug/m^3) countries experience the highest levels of $PM_{2.5}$. There has been little progress in addressing high PM levels in many countries and large urban areas in Asia and Africa. Many countries lack national standards for PM and do not monitor PM levels.

Public land in cities (SDG 11.7.1)

No data available

Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities.

Source: Dylan Passmore, 2010 (Flickr)
Tier II; Custodian agency: United Nations Human Settlements Programme (UN-Habitat)

More than half of the global population lives in cities. Increasing urban populations has resulted in higher demand for land in urban areas and open spaces in cities often being turned into buildings and infrastructure (UN-Habitat 2018c). Maintaining public space is important for sustainable urban development, for the well-being of people, and for the environment. Although there is evidence that open public space improves the social and economic value of cities, there is a lack of information on the amount of public space, the distance between people and public space, and the public space per capita. In order to promote improved urban planning, there is a need to demonstrate the value of public space and to better capture information related to public space.

Disasters: risk reduction for local government (SDG 11.b.1)

Too little data

Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.

Source: Department of Foreign Affairs and Trade 2012

This indicator is described under SDG 1.5.4. Tier I

Disasters: risk reduction strategies (SDG 11.b.2)

Too little data

Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030.

Source: Vietnam Disaster Risk Reduction Programming emergency practice drill (American Red Cross 2012).
Tier II; Custodian agency: United Nations Office for Disaster Reduction (UNISDR)

This indicator is described under SDG 1.5.3.

Financial assistance for buildings to least developed countries (11.c.1)

No data available

Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials.

Source: ILO in Asia and the Pacific, 2005 (Flickr)
Tier III; Custodian agency:

Many challenges exist in maintaining cities in a way that continues to create jobs and prosperity without straining the environment. Financial assistance for sustainable construction in LDCs is an important component of sustainable development. Globally, the construction industry is one of the largest users of energy, material resources, and water and it is a formidable polluter (UN 2016). Goal 11 aims to promote global cooperation in construction of sustainable and resilient buildings in LDCs through financial and technical support systems. In this regard, The United Nation's Secretary General Independent Advisory Group on Data Revolution for Sustainable Development emphasises the need for high-quality and reliable data (UN-Habitat 2018b). With 5 billion people projected to live in cities by 2030 and 95 percent of urban expansion in the next decades expected to take place in the developing world (UN 2018c), efforts must be intensified to ensure that all urban inhabitants live in resilient and sustainable communities and have access to adequate housing and basic services.

SDG 12: Sustainable consumption and production

Sweet Ice Cream 2016

Action plans for sustainability (SDG 12.1.1)

Too little data

Number of countries developing, adopting, or implementing policy instruments aimed at supporting the shift to Sustainable Consumption and Production.

Country with sustainable consumption and production

Source: UNEP 2017
Tier II; Custodian agency: United Nations Environment Programme (UNEP)

Well-designed national policy frameworks and instruments are necessary to enable the fundamental shift in the way we consume and produce. In 2018, 71 countries plus the European Union reported on a total of 303 initiatives. The sectors of relevance to reported instruments include energy (58 per cent of reported instruments), industry (51 per cent), agriculture (50 per cent), as well as waste and water (57 per cent and 46 per cent, respectively). While the pilot reporting showed a good balance between regulatory and voluntary approaches (46 per cent and 43 per cent, respectively), economic and financial instruments represented 11 per cent of all reported instruments. The structural role that SCP policies and measures could play in boosting sustainable financial investments, economic growth, and job creation may not yet have been fully tackled or operationalised. Innovative and dynamic instruments are needed to trigger transformative changes in the way the whole economy operates, creating drivers and incentives, generating new incomes and redirecting investments. Consumption and production patterns are intrinsically linked to fundamental aspects of social development, such as employment, women's empowerment, poverty eradication, shared prosperity and well-being at large.

Material footprint (SDG 12.2.1)

Change in a negative direction

Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.

Source: UNISDR 2012

This indicator is described under SDG 8.4.1. Tier III

Domestic material consumption (SDG 12.2.2)

Change in a negative direction

Proportion of total adult population with secure tenure rights to land, with legally recognised documentation, and who perceive their rights to land as secure, by sex and by type of tenure.

Source: Krivec 2014
Tier I; Custodian agency: United Nations Environment Programme (UNEP)

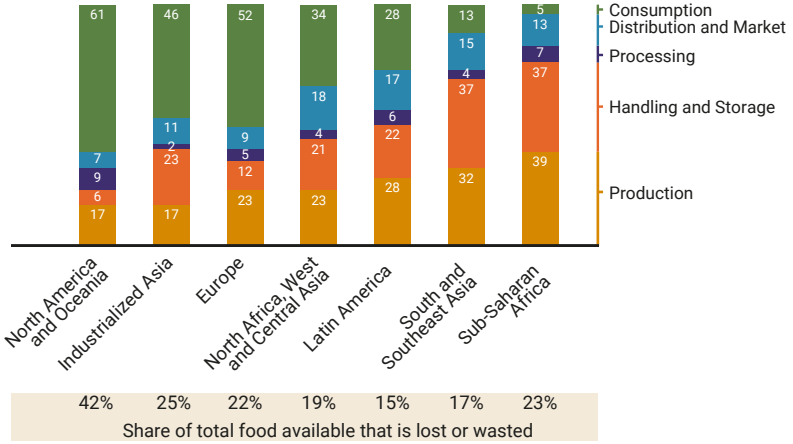
This indicator is described under SDG 8.4.2.

Food loss (SDG 12.3.1a) and food waste (SDG 12.3.1b)

No data available

Global food loss index.

Food Losses Near Production Are More Prevalent in the Global South While Food Waste Near Consumption Is More Prevalent in the Global North (Per cent of kcal Lost and Wasted)



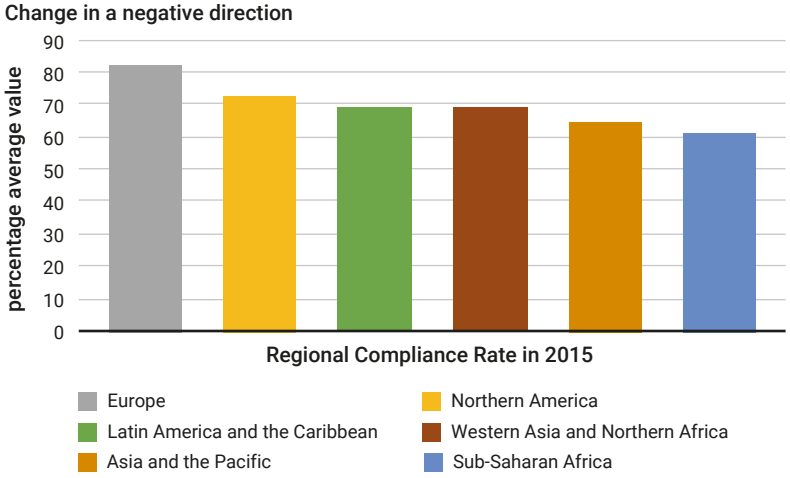
Source: Champions 12.3 and World Resources Institute 2018
Tier II(a)/Tier III(b); Custodian agency: Food and Agriculture Organization (FAO) and United Nations Environment Programme (UNEP)

Food is lost or wasted throughout the supply chain, from initial agricultural production down to final household consumption. Approximately one-third of all food produced in the world is lost or wasted (FAO 2011), resulting in roughly $940 billion in economic losses globally per year (FAO 2015). Food losses occur during the post-harvest and production stages up to retail, while food waste occurs in the post-retail and consumption stages of the food supply chain. In medium- and high-income countries, food is to a significant extent wasted at the consumption stage. Significant losses also occur early in the food supply chain in the industrialised regions. In low-income countries, food is lost primarily during the early and middle stages of the food supply chain (FAO 2011). While formal monitoring and reporting towards this SDG indicator has not yet begun, Champions 12.3 has analysed current food loss and waste targets and policies (Champions 12.3 2018). There has been a steady growth in the number of countries and companies setting targets in support of SDG target 12.3 and beginning to measure their food loss and waste. More than 100 companies are now measuring food loss and waste. 20% of the world's 50 largest food companies have established food loss and waste reduction programs, and half are engaged with their suppliers to reduce food loss and waste.

Information Transmitted under Chemicals and Waste Conventions (SDG 12.4.1)

Change in a negative direction

Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement.



Source: UNEP 2015
Tier I; Custodian agency: United Nations Environment Programme

Between approximately 60 and 80 per cent of the Parties to the Basel, Rotterdam, and Stockholm conventions and to the Montreal Protocol appear to have at least minimum institutional capacity to implement these MEAs. This indicator is based on the rate of transmission information for the five main MEAs in the chemicals and waste cluster. There are nuances between the rate of transmission of information under the different MEAs; for example, under the Montreal Protocol, the rate of transmission of information is much higher than under the Basel, Rotterdam, and Stockholm conventions. Among the key challenges linked to the transmission of information under the Basel and Stockholm conventions are the lack of availability of data and information, inadequate legal and institutional frameworks, lack of capacity, lack of understanding of the usefulness of the information reported, lack of consequences in case of non-transmission of information, and low political priority of the issues at hand. Under the Montreal Protocol, challenges are significantly mitigated. For instance, because there are consequences in case of non-reporting, Parties are required to establish licensing systems, and developing countries get financial support for institutional strengthening.

Hazardous waste generation (SDG 12.4.2)

No data available

Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment.

Source: MPCA Photos, 2014 (Flickr)
Tier III; Custodian agency: United Nations Environment Programme (UNEP) and United Nations Statistics Division

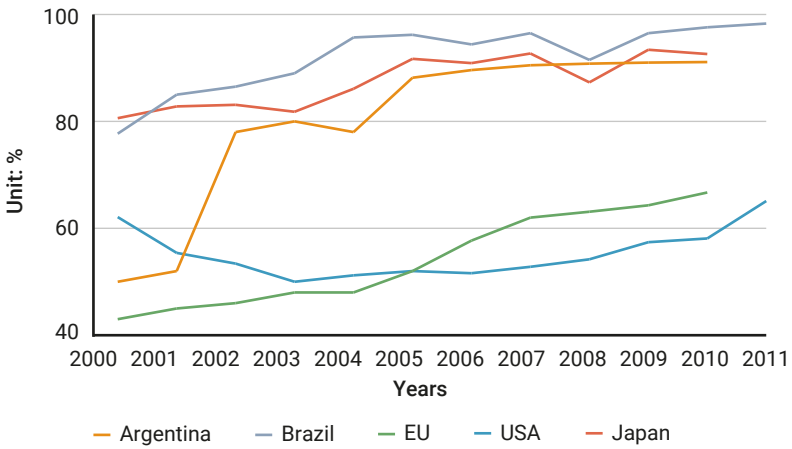
Hazardous waste generation and the threat that hazardous waste poses to human health have grown over the past decades in most regions of the world. Economic development and evolving technologies have led to a diversification in the types and number of chemicals and substances used in industry, many of which ultimately become hazardous waste at the end of their lifecycle. The proportion of hazardous waste that is treated according to environmentally sound standards varies widely by region, as emerging economies struggle to keep up with the financial and technical demands of their increased hazardous waste production. However, there is still a lack of information on hazardous waste treatment and information is not standardised across countries. Under the Basel Convention, Parties agreed to a broad definition of the environmentally sound management of hazardous wastes and other wastes. However, Parties still face challenges with its implementation and reporting. Most hazardous waste is of industrial origin – for household hazardous waste, while non-negligible, there is limited information available.

Recycling (SDG 12.5.1)

No data available

National recycling rate, tons of material recycled.

Index of recycling aluminum cans (2000–2011)



Source: UNEP & IRP (2013) Metal Recycling: Opportunities, Limits, Infrastructure
Tier III; Custodian agency: United Nations Environment Programme (UNEP) and United Nations Statistics Division

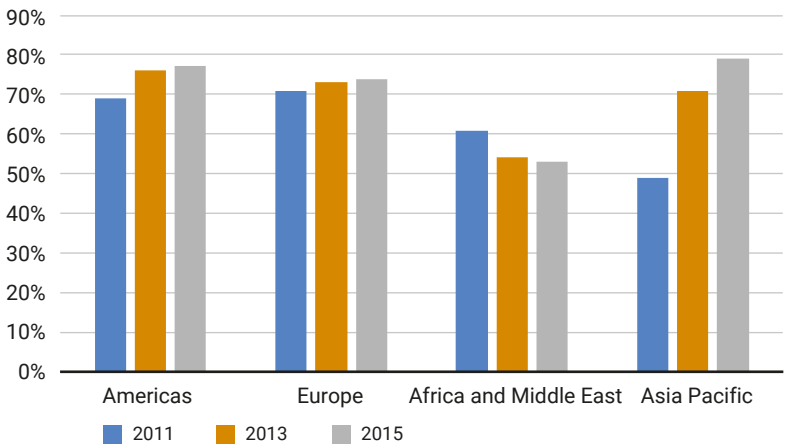
While the general public's awareness of the importance of recycling has assuredly risen in recent years, woefully little material consumed is actually recycled back into production processes. A recent study estimated the global aggregated recycling rate at only around six per cent of total material input in 2005, which indicates a lack of manifestation of the 'circular economy' (Haas *et al.* 2015). There have been gains in recycling and reuse in a number of sectors; however, the recycling rate is still low. Several challenges stand in the way of uniformly collected global data on recycling, including the multi-step nature of the recycling value chain, which adds variability to data collected, and the significant role of the informal sector across many regions, for which data are difficult to gather. The indicator will be calculated as the material recycled, including that which is exported for recycling, but excluding any quantities imported for recycling, divided by the total waste generated for any given reporting year. In order to understand the recycling rate and its relation to the circular economy, there is a need for information on key waste streams, metal ore, packaging waste, and electronic waste.

Corporate sustainability reporting (SDG 12.6.1)

No data available

Number of companies publishing sustainability reports.

Rate of sustainability reporting among the 100 largest companies per country



Source: KPMG Survey of Corporate Responsibility Reporting 2015
Tier III; Custodian agency: United Nations Environment Programme (UNEP) and United Nations Conference on Trade and Development (UNCTAD)

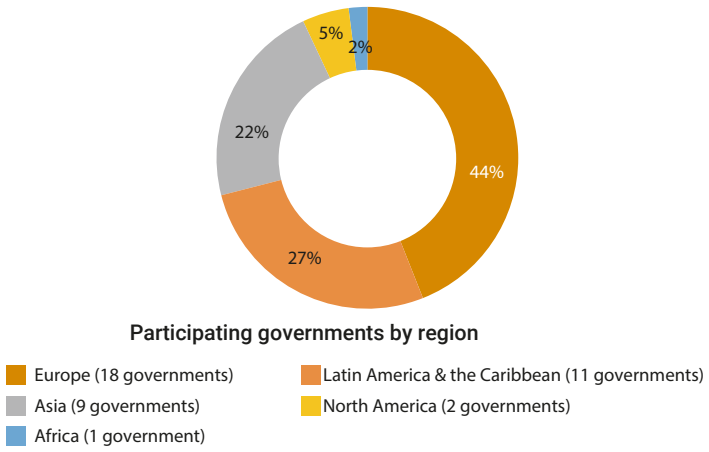
Corporate sustainability reporting is an important tool for transparency and accountability and has become a common practice in many industries, especially large industries and transnational corporations. Its role in attaining the 2030 Agenda and the SDGs has been recognised: high quality and comparable reporting contributes to financial stability and promotes good governance as well as responsible practices which are fundamental to sustainable development. In many markets, both in developed and developing countries, the disclosure of sustainability information has grown in the last decade, especially among large companies. Reasons for this increase include the pressing environmental and social challenges and a rising interest in sustainability reporting by governments, investors and stock exchanges, resulting in regulations and incentives for reporting. Progress is still needed in harmonizing the practice of corporate reporting and in improving its effectiveness in informing more sustainable business practices. The lack of high-quality repositories of sustainability reports at national, regional, and international levels represents an obstacle to quantifying SDG indicator 12.6.1. Making data available for this indicator will require further investment in quality standards setting and in supporting the collection and analysis of reports at national, regional, and global levels.

Sustainable public procurement (SDG 12.7.1)

No data available

Number of countries implementing sustainable public procurement policies and action plans.

Participating governments by region



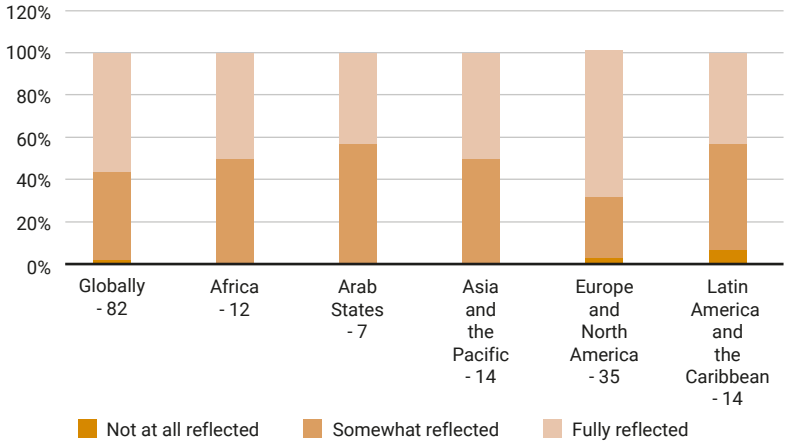
Source: UNEP Global Review of Sustainable Public Procurement 2017
Tier III; Custodian agency: United Nations Environment Programme (UNEP)

Sustainable procurement is increasingly recognized as a strategic lever to drive sustainability and integration across sectoral policies (UNEP 2017b). While previously, sustainable public procurement practices predominately focused on energy conservation, resource efficiency and climate change mitigation, an evolution towards a broader approach has been noted in the UN Environment 2017 Global Sustainable Public Procurement Review, with governments using procurement policies to encourage social inclusion and equity (UNEP 2017c). This development is however not homogeneous: trends show that countries in the Asia and the Pacific region are more likely to focus on environmental issues, while other regions prioritise a wider range of socio-economic and ethical issues. Countries show variation in sustainable procurement policy priorities and the level of financing and enforcement prescribed. It is notable that more and more countries develop information systems to monitor their sustainable procurement practices and the process of institutionalisation of Sustainable Public Procurement. Among these, only a few countries are presently able to report on the percentage of their public procurement which can be considered sustainable. An even more limited number of countries monitor the sustainability impacts of their Sustainable Public Procurement policies.

Education for sustainable lifestyles (SDG 12.8.1)

No data available

Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment.



Source: Sixth Consultation on the implementation of the Recommendation concerning Education for International Understanding, Cooperation and Peace and Education relating to Human Rights and Fundamental Freedoms), roughly half of countries have education policies which promote sustainable development and global citizenship principles (UNESCO 2016a).
Tier III; Custodian agency: UNESCO Institute for Statistics (UNESCO-UIS)

The 2018 High Level Political Forum Review of SDGs implementation affirms that, "there needs to be a shift away from economic models that value growth for growth's sake, towards a new mind-set that respects planetary boundaries, recognises the economy as a subset of nature, and supports the concept of living in harmony with nature". Based on the on findings from the Sixth Consultation on the implementation of the Recommendation concerning Education for International Understanding, Cooperation and Peace and Education relating to Human Rights and Fundamental Freedoms, roughly half of countries have education policies which promote sustainable development and global citizenship principles (UNESCO 2016b).

Research for sustainable lifestyles (SDG 12.a.1)

No data available

Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies.

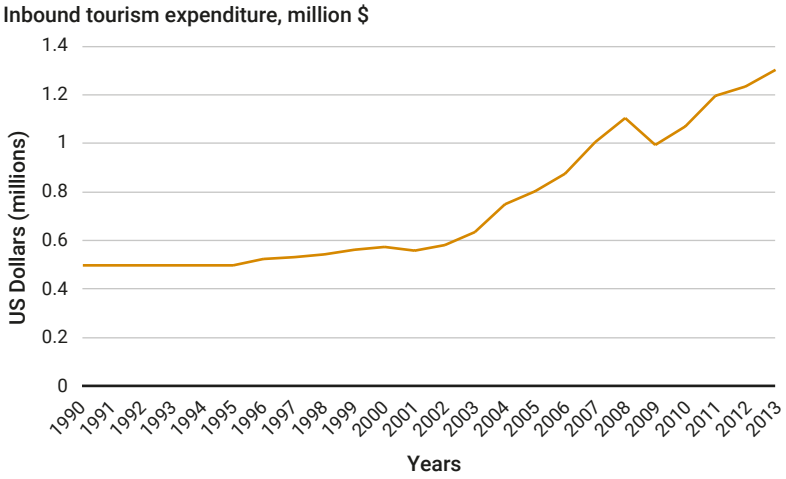
Source: Rawpixel 2018
Tier III; Custodian agency: UNESCO Institute for Statistics (UNESCO-UIS)

There is a need to improve SCP and environmentally sound technologies and, in order to develop new practices and technologies which work in developing countries, additional research is needed. However, defining and measuring research related to SCP and environmentally sound technologies is very challenging and thus there is little information on this indicator. In fact, the methodological development of this indicator is currently lagging behind the other SDGs indicators under Goal 12 with no current workplan or methodological proposal.

Sustainable tourism strategies (SDG 12.b.1)

No data available

Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools.



Source: UNEP 2013
Tier III; Custodian agency: World Tourism Organization (UNWTO)

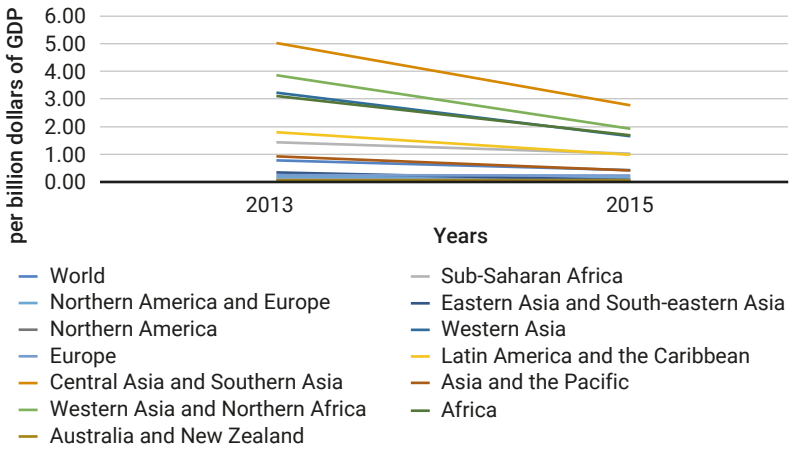
Despite 10.4 per cent of the world's GDP being either directly or indirectly related to tourism in 2017 (UNWTO 2018), very little is known about the sustainability of the tourism sector. The concept of "sustainable tourism" was first established in the 1990s and there has been considerable work to develop the concept of sustainable tourism from both a policy and measurement perspectives. However, there is no internationally agreed upon definition nor is there any agreement on what constitutes "sustainable tourism strategies or policies and implemented action plans" (UNWTO 2017) Through promotion of sustainable tourism, including ecotourism, for poverty eradication and environment protection, sustainable tourism ought to make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural resources and biodiversity. Achieving sustainable tourism is a continuous process and it requires constant monitoring of impacts, introducing preventive and corrective measures whenever necessary (UNEP and UNWTO 2005). Developing appropriate statistical definitions and classifications with particular reference to tourism would fill important data gaps and provide the basis for the derivation of many relevant sustainable tourism indicators.

Fossil fuel subsidies (SDG 12.c.1)

Too little data

Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels.

Estimated value of regional fossil-fuel consumption subsidies 2013-2015



Source: UNEP 2015
Tier II; Custodian agency: United Nations Environment Programme (UNEP)

While often designed to fight poverty, fossil fuel subsidies are a poorly targeted instrument, which disproportionately benefits wealthy households, encourage wasteful use of dirty energy, exacerbates fiscal deficits and represents a significant obstacle in the global effort to decouple economic growth from natural resource use. By making fossil fuels relatively inexpensive, subsidies distort energy markets and discourage businesses and consumers from reducing material footprints and making more resource-efficient consumption and production choices. Currently, no internationally-accepted method exists to measure fossil fuel subsidies. Globally, consumer price support subsidies have fallen from almost $500 billion in 2012 to $260 billion in 2016 according to the IEA estimates, while production subsidies have likewise decreased from $46 billion to $35 billion among the 43 countries tracked by the OECD over the same time period. By creating fiscal space, reforms can redirect public resources to addressing poverty, education, and other development priorities, while improving health outcomes by reducing air pollution. Likewise, by correcting price distortions, reforms can promote clean energy and stimulate private investment in low-carbon technologies, while mitigating greenhouse gas emissions.

SDG 13: Climate action

Tatiana 2019

Disasters: persons affected (SDG 13.1.1)

Change in a positive direction

Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population.

Source: UNICEF 2013

This indicator is described under SDG 1.5.1. Tier II

Disasters: risk reduction strategies (SDG 13.1.2)

Too little data

Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030.

Source: UNISDR 2012

This indicator is described under SDG 1.5.3. Tier I

Disasters: risk reduction for local government (SDG 13.1.3)

Too little data

Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.

Source: Dominiqueb, 2009 (Flickr)
Tier II; Custodian agency: United Nations Office for Disaster Reduction (UNISDR)

This indicator is described under SDG 1.5.4.

Climate change action plans (SDG 13.2.1)

No data available

Number of countries that have communicated the establishment or operationalisation of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other).

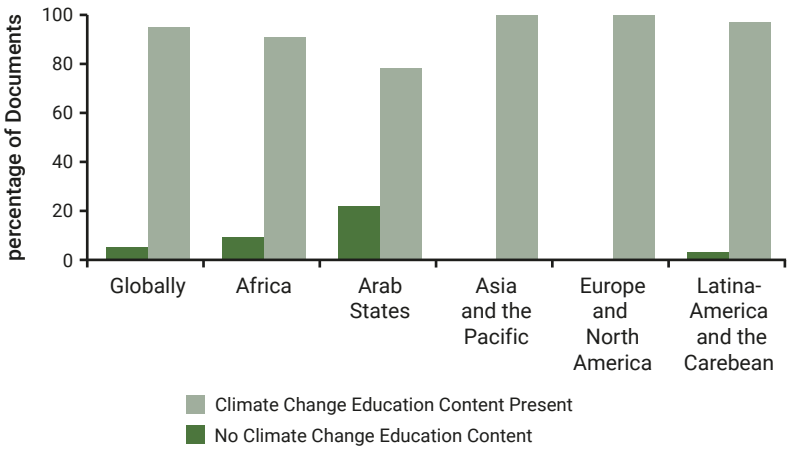
Source: Shutov 2018
Tier III; Custodian agency: United Nations Framework Convention on Climate Change (UNFCCC)

The effectiveness of individual domestic adaptation activities is expected to be enhanced by providing a comprehensive national policy framework for coordination, mainstreaming, implementation, monitoring, and review. The annual Secretary General SDG Progress Reports report on progress made in countries and provision of Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). Looking ahead, NAPs will be an organic part of the formulation and implementation of countries' NDCs. As of December 2018, 12 developing countries submitted NAPs (United Nations Framework Convention on Climate Change [UNFCCC] 2018). According to a UNFCCC Secretariat technical paper (2017), "Integrating adaptation with the SDGs and the Sendai Framework can be very beneficial for building resilience comprehensively across societies" (UNFCCC 2017). While maintaining the autonomy of each, improved coherence of action to implement the three frameworks can save money and time, enhance efficiency, and further enable adaptation action. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. As of December 2018, 181 Parties have submitted their first NDCs, and one Party has submitted their second NDC. Current national commitments on emission reduction are not enough to bridge the emissions gap in 2030 (UNEP 2018d).

Climate change education (SDG 13.3.1)

No data available

Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula.



Source: UNESCO 2018b
Tier III; Custodian agency: United Nations Framework Convention on Climate Change (UNFCCC) and UNESCO Institute for Statistics (UNESCO-UIS)

Climate change education is essential for reducing vulnerability and increasing resilience to climate change. The power of education in climate change responses was acknowledged at the Paris Climate Conference (COP 21) in 2015 with Article 12 on education (UN 2015). Climate change education helps learners understand the causes and consequences of climate change, prepares them to live with its impacts, and empowers them to adopt more sustainable lifestyles. Based on a recent study on climate change education practices worldwide, there is a need to increase national activities related to climate change education, targeting a broader range of audiences; move beyond cognitive knowledge-centred approach to more focus on socio-emotional and behavioural learning outcomes; and increase the data available on the quantity and quality of climate change education (UNESCO 2010)[cvi]. UNESCO has made a number of gains towards promoting climate change and sustainable development education through their work on using education on sustainable development as a leapfrogging opportunity for development (UNESCO 2016c) and on better communication related to climate change and development (Zaval and Cornwell 2016).

Community based approaches for climate change (SDG 13.3.2)

No data available

Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions.

Source: Dave 2017
Tier III; Custodian agency: United Nations Framework Convention on Climate Change (UNFCCC) and UNESCO Institute for Statistics (UNESCO-UIS)

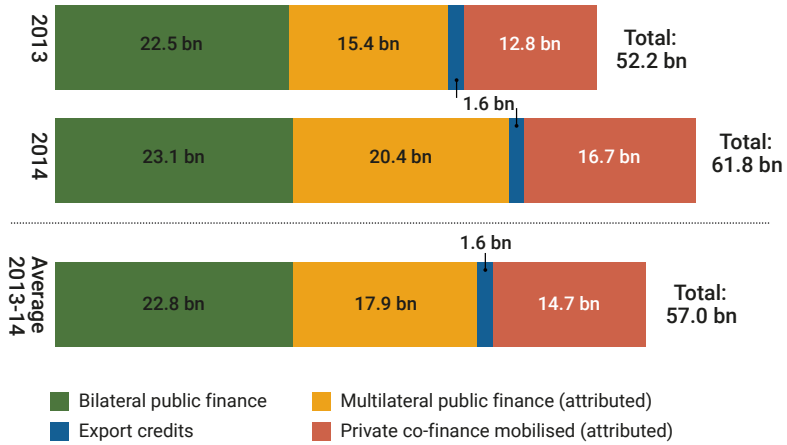
The Seventeenth Convention of Parties on Climate Change in 2018 decided that developed country Parties should submit their biennial report two years after the due date of a full national communication (UNFCCC 2018). Compilation and synthesis of third biennial reports of Parties included in Annex I to the Convention noted that climate-related legal, institutional, and policy frameworks are being strengthened, reflecting lessons learned and responding to the requirement to prepare for the implementation of the Paris Agreement. Of the capacity-building activities reported, twice as many are aiming to build capacity for adaptation than for mitigation. In addition, numerous activities address capacity-building in multiple sectors, and a minority are focusing on technology development and transfer. While technology transfer, together with capacity-building support, is focusing on the needs of developing countries in the lead-up to 2020, it is also helping to create and strengthen their institutional and policy frameworks for action after 2020.

Resources mobilised for climate action (SDG 13.a.1)

No data available

Mobilised amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment.

Mobilised climate finance in 2013 and 2014, by funding source (USD billions)



Source: "Climate finance in 2013-14 and the USD 100 billion goal" (Organisation for Economic Co-operation and Development [OECD] 2015)
Tier III; Custodian agency: United Nations Framework Convention on Climate Change (UNFCCC) and Organisation for Economic Co-operation and Development (OECD)

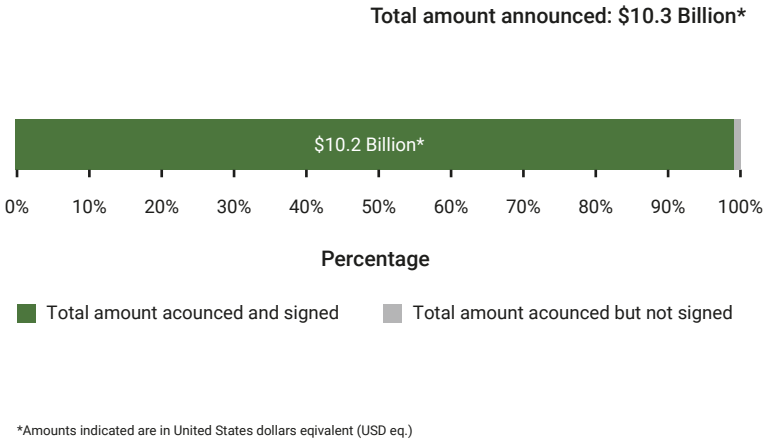
Developed countries have committed to jointly mobilize $100 billion a year in climate finance by 2020 to address the needs of developing countries, in the context of meaningful mitigation actions and transparency on implementation (UNFCCC 2009). Three key factors for achieving the $100 billion a year commitment have been identified: the level of public finance in 2020; the way in which it is allocated between projects aimed at mobilizing private climate finance and those which do not; and the private-public ratio with which public finance is able to mobilize private climate finance. Based on public pledges, developed countries are projected to increase the levels of public climate finance – bilateral and multilateral – to close to $67 billion by 2020. The report concludes that: "While a higher level of public finance always enhances developed countries' ability to meet the USD 100 billion commitment, it does not guarantee a higher level of overall climate finance, which also depends on the portfolio of projects and the average private-public finance ratio" (UNFCCC 2009).

Climate action support for LDCs (SDG 13.b.1)

No data available

Number of least developed countries and small island developing States that are receiving specialised support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalised communities

Current status of the Green Climate Fund

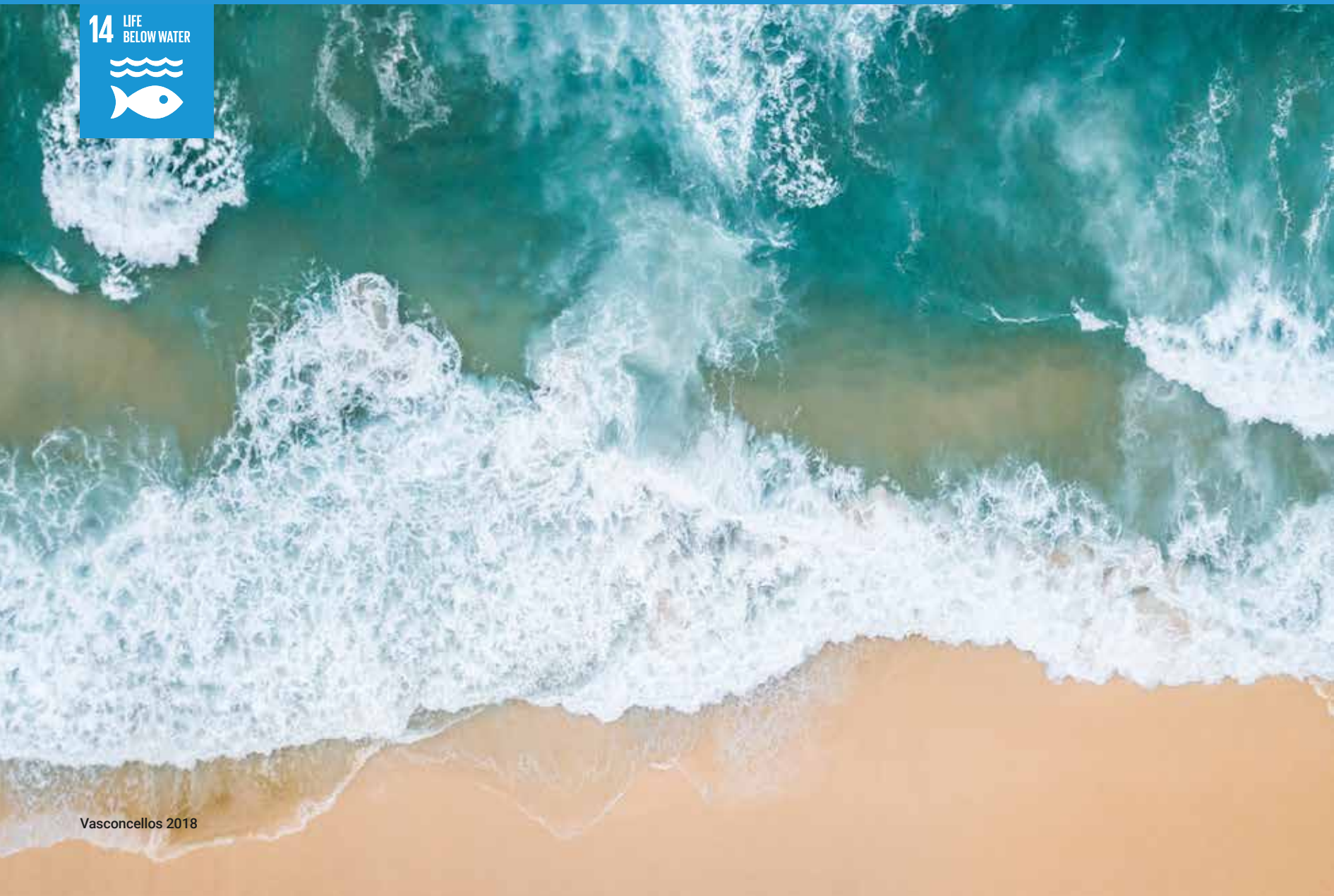


*Amounts indicated are in United States dollars eqivalent (USD eq.)

Source: (Green Climate Fund [GCF] 2018).
Tier III; Custodian agency:

There is little information on the total amount of support for climate change-related activities in LDCs; however, in terms of formal support, the Green Climate Fund instrument is now operational. As of 24 September 2018, the Green Climate Fund had approved nine project proposals under the LDCs Fund, seeking funding to support activities related to the process to formulate and implement NAPs. Total funding of $15 million (28 percent of all projects submitted) was approved for LDCs under the Green Climate Fund Readiness and Preparatory Support Programme for supporting the formulation of NAPs, with funds disbursed for six projects.

SDG 14: Oceans



Vasconcellos 2018

Marine pollution (SDG 14.1.1)

No data available

Index of coastal eutrophication and floating plastic debris density.

Plastic distribution

Source: TWAP 2019
Tier III; Custodian agency: United Nations Environment Programme (UNEP)

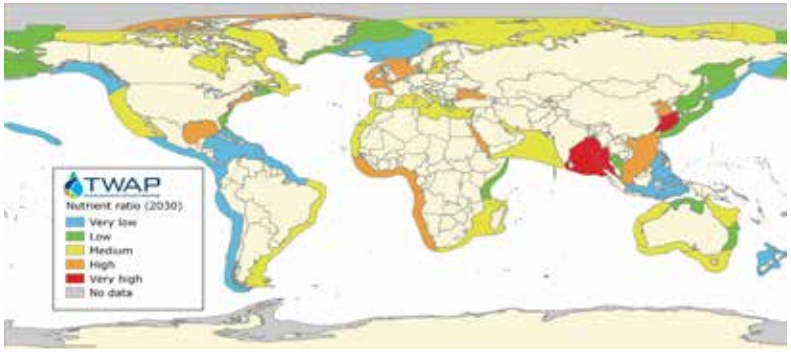
The accumulation of marine litter in the world's oceans over the past decades has risen. Plastic is ubiquitous, cheap to produce and extremely durable (Ryan 2015). Every piece of plastic ever produced still exists, therefore much of it has ended up, in the oceans. Worryingly, plastic breaks up over time into smaller and smaller pieces known as microplastics, which end up in wastewater, freshwater, and marine environments and are ingested by marine life such as plankton and shellfish, which are in turn consumed by ever larger predators and have been shown to make it all the way to our dinnerplates, with unknown consequences (Rochman *et al.* 2016). Larger marine wildlife has also suffered from ingestion of and entanglement in marine debris, with growing numbers of whales, turtles, and seabirds found dead with stomachs full of plastic. While public awareness for this issue has grown rapidly in recent years, in part thanks to documentary series such as the BBC's Blue Planet II and to public outreach campaigns such as UN Environment's Clean Seas Campaign, much work remains to be done to understand and mitigate the impacts of marine litter and microplastics on marine ecosystems (UNEA 2017). While some data exist at local and regional levels, consolidated global databases and source inventories based on standardised methodologies will be needed to better understand the flows of litter into the marine environment (Kershaw *et al.* 2011).

Coastal eutrophication (SDG 14.1.1)

No data available

Index of coastal eutrophication and floating plastic debris density.

Index of Coastal Eutrophication Potential



Source: TWAP 2019
Tier III; Custodian agency: United Nations Environment Programme (UNEP)

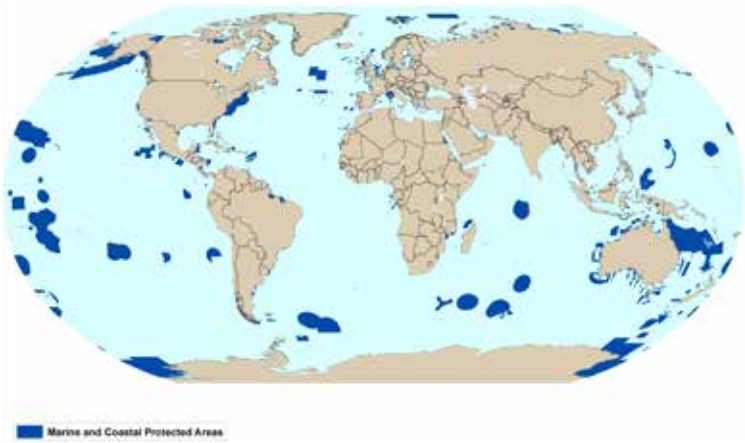
Coastal eutrophication is caused by an excess of minerals and nutrients in water, particularly nitrogen, which is the most common limiting nutrient in marine waters. Its overabundance induces a rapid growth of marine plants such as phytoplankton, also known as an algal bloom. When the phytoplankton die, their decomposition process consumes available oxygen in the water, which fundamentally alters the environment and has a negative impact on biodiversity. In extreme cases, all the available dissolved oxygen is consumed, and the area becomes known as a 'dead zone' - where almost no life survives (Rabalais *et al.* 2015). While eutrophication is a natural phenomenon, the primary causes of algal blooms and 'dead zones' are improper wastewater management and agricultural runoff, where excess fertilisers containing nitrogen are carried away by rainwater (Breitburg 2018). Some regions, including some developed regions, such as the Baltic Sea, collect data on coastal eutrophication. The only global data available to monitor coastal eutrophication is through proxy indicators such as the quantity of fertilisers applied to agricultural lands worldwide.

Management of marine areas (SDG 14.2.1)

No data available

Proportion of national exclusive economic zones managed using ecosystem-based approaches.

Official MPA map



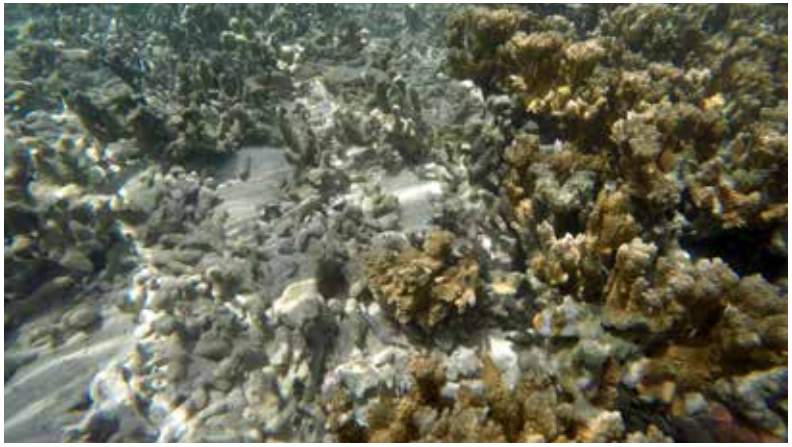
Source: IUCN 2017
Tier III; Custodian agency: United Nations Environment Programme (UNEP)

Managing and conserving marine areas is essential for achieving the SDGs. Marine spatial planning, Inter-Coastal Zone Management, Protected Areas, Ecosystem-Based Adaption Plans and other forms of marine management all play a part in managing oceans. Information on different management types could be used to measure this target; however, additional research on how to combine information on different types of management is needed. As of the close of 2018, marine protected areas cover 7.4 per cent of the global ocean at almost 27 million km^2. About 90 per cent of this area lie within the territorial sea or Exclusive Economic Zones of coastal nations, and only 10 per cent is located in the high seas. While the total marine protected area appears on track to meet the Aichi target in two more years, a recent analysis by Lewis (2017) indicates that only 41 per cent of 232 marine ecoregions, less than half, have met the 10 per cent target, with 10 ecoregions still without protection to date. It is important to conserve at least 10 per cent of each ecoregion to ensure ecological representation among protected areas for measuring progress in effective marine area protection. The Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects is an existing process which assesses marine management and the state of the marine environment (UN 2002).

Ocean acidification (SDG 14.3.1)

No data available

Average marine acidity (pH) measured at agreed suite of representative sampling stations.



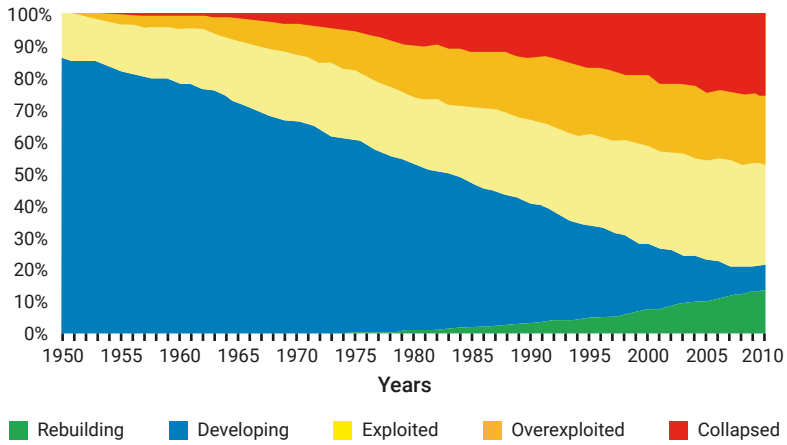
Source: Peter Prokosch, 2016 (GRID-Arendal)
Tier II; Custodian agency: Intergovernmental Oceanographic Commission (IOC) of UNESCO

Marine acidification is a process by which atmospheric CO_2 dissolves into seawater and reacts with it to produce carbonic acid, lowering the pH of the seawater. While this is a natural process that has fluctuated over geological time, the surge in emissions of CO_2 brought on by the industrial revolution has greatly accelerated the phenomenon. An acidifying environment poses serious threats to marine life, such as by threatening all organism that rely on a calcium carbonate shell (e.g. shellfish) and by degrading key habitats through coral bleaching, which leads to longer-term disruptions in marine food chains and losses to marine biodiversity (Caldeira and Wickett 2003). While dataare collected regionally by various organisations, no central database or internationally-harmonised methodology as yet exists to produce a global picture of the state of ocean acidification.

Sustainable fish stocks (SDG 14.4.1)

Change in a negative direction

Proportion of fish stocks within biologically sustainable levels.



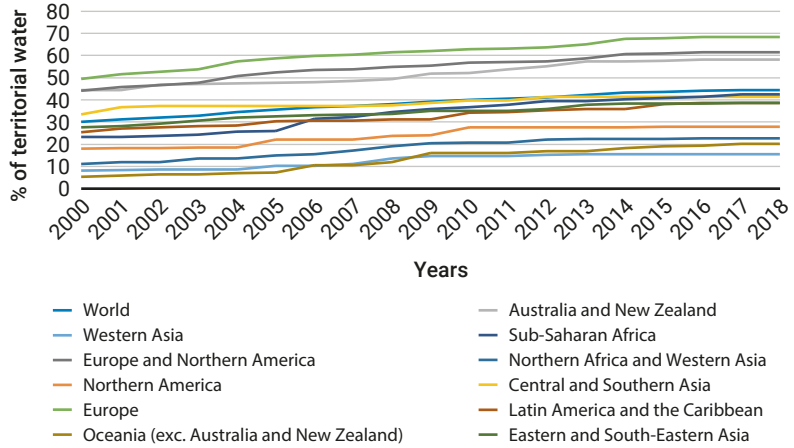
Source: Pauly and Lam 2016
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

The number of fish stocks and the catch biomass obtained using catch data, provide useful information on the overall development state of fish stocks. Overexploited fish stocks are those with catch biomass that fall below 50 per cent of their respective maximum stock size - those that decrease below 10 per cent are considered "collapsed" stocks (Pauly and Lam 2016). Of the over 4,000 fish stocks included in the analysis, 21 per cent are overexploited (<50 per cent of their maximum stock size) while another 26 per cent are collapsed (< 10 per cent of their maximum stock size) over a 60-year period. A catch biomass plot shows a less worrisome figure, with collapsed stocks accounting for only two per cent beginning in 2000. In the case of the South China Sea Large Marine Ecosystem, which yielded the highest total economic impact from 2010 catch, the stock number plot shows collapsed stocks to reach 20 per cent; and overexploited stocks account for another 18 per cent. Again, the catch stock biomass data indicate that only two per cent of catch stock biomass is in collapsed state. To maintain the food provisioning ecosystem service of large marine ecosystems, it is critical that their biodiversity is protected and maintained in the long-term.

Marine protected areas (SDG 14.5.1)

Change in a positive direction

Coverage of protected areas in relation to marine areas.



Source: Lewis 2017
Tier I; Custodian agency: UN Environment World Conservation Monitoring Centre (UNEP-WCMC), BirdLife International (BLI) and International Union for Conservation of Nature (IUCN)

As of January 2018, over 22 million km² (16 per cent) of waters under national jurisdiction (0-200nm) were covered by protected areas, representing a doubling in extent since 2010 (Lewis 2017). Much of this coverage is concentrated in Oceania, Latin America, and the Caribbean. Protected area coverage for the entire marine realm is calculated to be 7.3 per cent. Protected area coverage of areas of particular biodiversity importance in the marine realm has also increased, with the mean coverage of each marine Key Biodiversity Area now reaching 44 per cent. However, the coverage is not consistent around the world. North America, Australia, and New Zealand have the highest protection of marine Key Biodiversity Areas

Fishing regulation (SDG 14.6.1)

No data available

Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing.

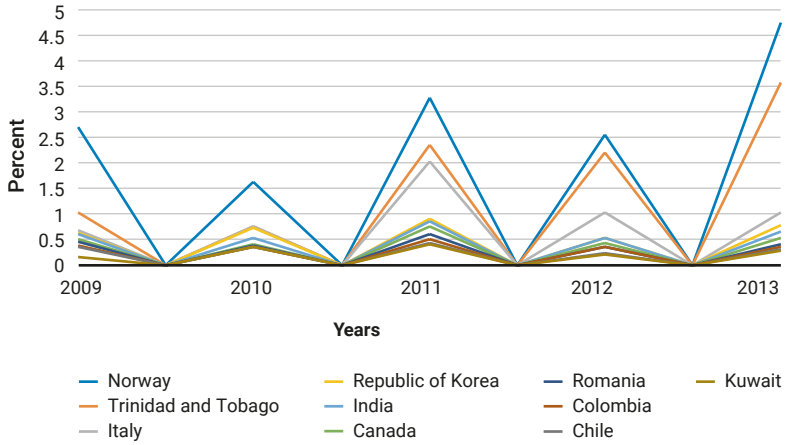
Source: Peter Prokosch, 2016 (GRID-Arendal)
Tier II; Custodian agency: Food and Agriculture Organization (FAO)

The global fishing industry has faced increased regulations over recent decades, as multiple fish stocks have dwindled and a broad awareness of the need for careful fisheries management has grown. The United Nations Convention on the Law of the Sea (UNCLOS) provides the legal framework for sustainable fisheries both in areas within national jurisdiction and beyond national jurisdiction. However, little data exist on national regulations – in part due to the lack of internationally-harmonised definitions of fisheries management. Most countries have their own definitions and policies within their territorial waters, while international waters fall under the purview of UNCLOS (UN 1982). While the FAO collects the most reliable summary statistics on global fish stocks and their associated management (FAO 2016), no organisation collects information on specific regulations pertaining to international fisheries. Situated between the national and international management levels, the several Regional Seas programmes may be most strategically placed to collect data on national and trans-border fishing regulations.

Scientific knowledge, research capacity and transfer of marine technology (SDG 14.a.1)

Too little data

Proportion of total research budget allocated to research in the field of marine technology.



Source: UNSD 2013
Tier II; Custodian agency: Intergovernmental Oceanographic Commission of UNESCO

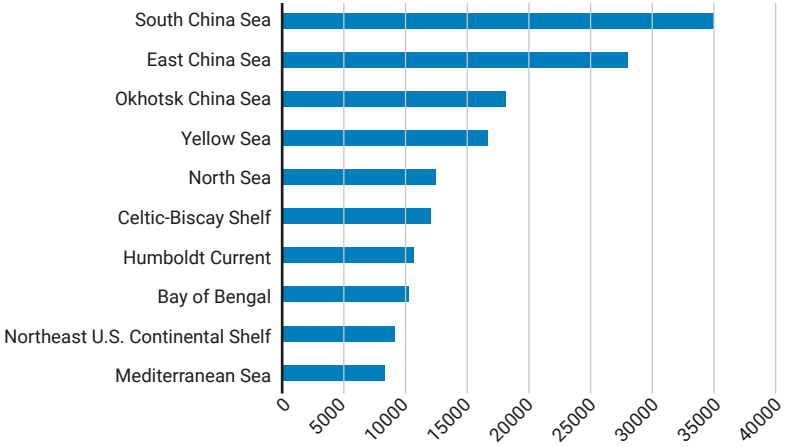
Operational coastal and marine observing platforms and laboratories that generate research and operational oceanography/meteorological products to multiple users including providing the science and evidence base for national policy and strategic planning are key for advancements in SDG 14 (Oceans). Funding for marine technology research is essential for understanding our oceans; however, funding must also be coupled with well-functioning educational institutions, communities of experts, observing platforms, and high-quality data streams, in order to understand whether marine technology is effective in improving ocean health and dependent human wellbeing. The assembly of data to support indicator development and assessment should be well mapped out and integrated into the functions of existing technical working groups such as the International Oceanographic Commission (IOC) Group of Experts on Capacity Development.

Fisheries subsidies Economic benefits to SIDS and LDCs (SDG 14.7.1)

No data available

Sustainable fisheries as a percentage of GDP in small island developing States, least developed countries and all countries.

National ocean science expenditure as a share of total research and development funding (%)



Source: UNEP 2010
United Nations Conference on Trade and Development [UNCTAD] 2016
Tier III; Custodian agency: Food and Agriculture Organization (FAO) and UNEP-WCMC

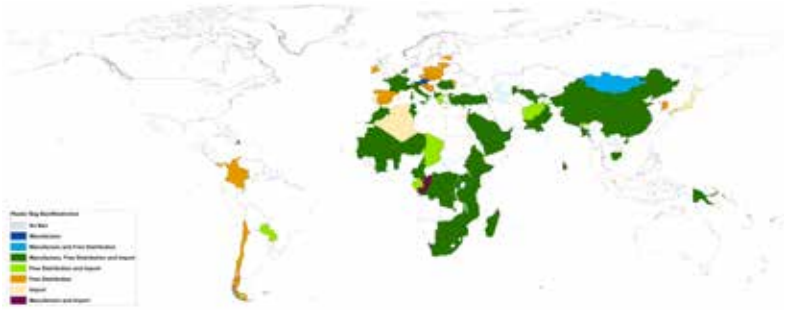
The marine fisheries industry has remained a challenging economic sector to evaluate. Dyck and Sumaila (2010) used input output modelling for 187 fishing nations to determine total economic output of landed catch at ex-vessel prices in 2003 (Dyck and Sumaila 2010). This assessed total economic impact for 2010 landed catch and value data for 66 large marine ecosystems and surrounding coastal states. The economic impact of marine fisheries in each of 37 fishing nations and the Faeroe Islands accounts for 1% of their respective GDPs or greater. Three-fourths of these are tropical developing countries. Among large marine ecosystems, the aggregated total economic impact of marine fisheries in the South China Sea based on 2010 catch tops the Large Marine Ecosystem (LME) list at $35 billion (Sea Around Us 2016). Across the 66 LMEs in 2010, a global catch of 56.5 million tons priced dockside at $94 billion created an aggregate total economic impact valued at $259 billion. The ecosystem impacts of such high levels of extraction must be assessed.

Ocean-related instruments for the conservation and sustainable use of the oceans and their resources (SDG 14.c.1)

No data available

Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources.

Global overview of countries with bans on the manufacture, free distribution, and importation of plastic bags



Source: UNEP 2018: Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations
Tier III; Custodian agency: The Division for Ocean Affairs and the Law of the Sea (UN-DOALOS), Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP), International Labour Organization (ILO), other UN-Oceans agencies

Challenges in ocean management include ineffective implementation and compliance, lack of coordination and capacity, and inconsistent reporting. Fragmentation in many policies and national legislations on ocean affairs results in insufficient intersectoral coordination, constraints from competing interests, and incomplete assessments of implementation. Low level of responses in reporting requirements creates limited information on how States have followed up with obligations and commitments to ocean affairs through UNCLOS (UNGA 2018). Despite these challenges, and even without a global mechanism for facilitating the transfer of marine technology, transfer of marine knowledge through databases and geographic information systems does occur through bilateral cooperation among States through United Nations bodies and international organisations such as the Intergovernmental Oceanographic Commission, the International Maritime Organization, FAO, and the International Seabed Authority, among others (UNGA 2017b).

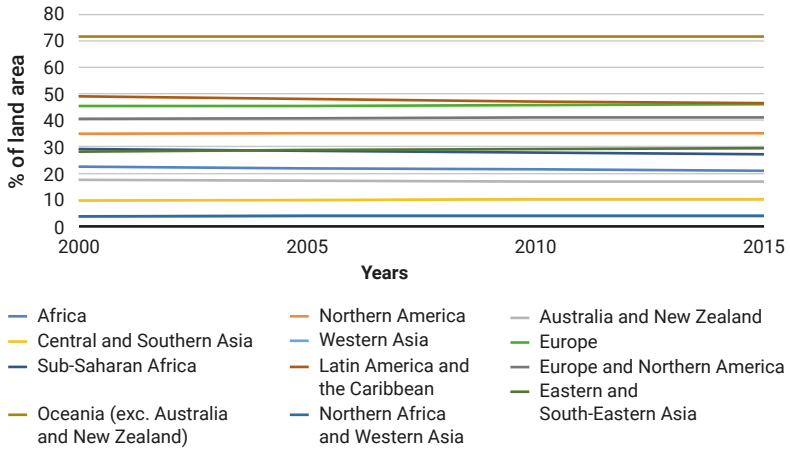
SDG 15: Land and biodiversity

Morsy 2015

Forest areas (SDG 15.1.1)

Change in a negative direction

Forest area as a proportion of total land area.



Source: UNSD 2015
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

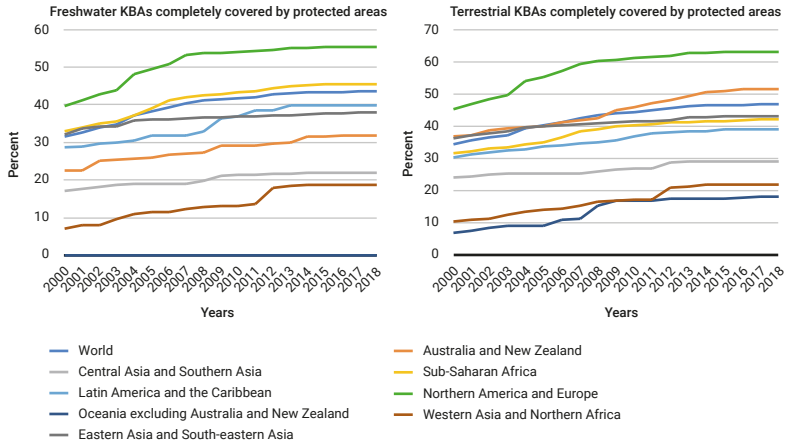
Among all the regions, Africa is showing a consistent trend of loss in forest as a proportion of its total land area. While its decrease from 22.52 per cent in the year 2000 to 20.96 per cent in 2015 may not appear to be significant at first glance, it represents a drop of 6.9 per cent. The downward trend is particularly sharp in certain Sub-Saharan African countries such as Togo, Uganda, and Nigeria. This is further elaborated under the SDG indicator 15.2.1.

Latin America and the Caribbean is another region that has a downward trend in forest coverage from 49.07 per cent in 2000 to 46.46 per cent in 2015, representing a decrease of 5.3 per cent. Within Asia, while West Asia, East Asia, and South Asia have made positive gains in this indicator, South-East Asia and Central Asia have recorded loss during the same time period. In the high-income world, both North America and Europe have made slight gains in forest cover.

Protection of key biodiversity areas (SDG 15.1.2)

Change in a positive direction

Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type.



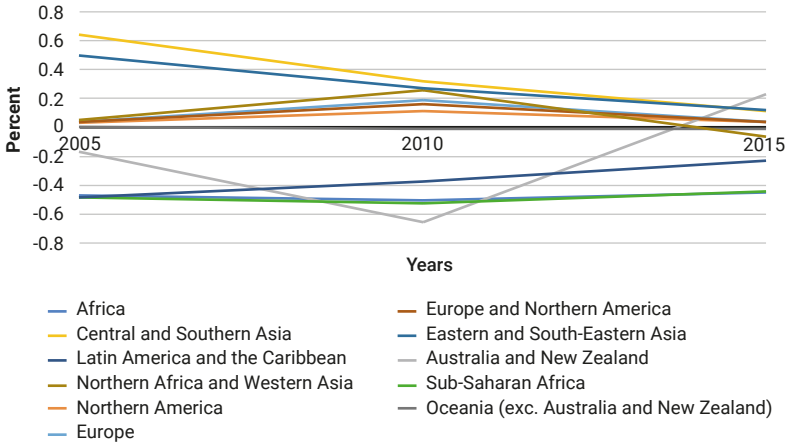
Source: UNEP 2018
Tier I; Custodian agency: UN Environment World Conservation Monitoring Centre (UNEP-WCMC), BirdLife International (BLI) and International Union for Conservation of Nature (IUCN)

The proportion of important sites for biodiversity that are covered by protected areas continues to increase in both terrestrial and freshwater ecosystems. As of January 2018, an average of 44 per cent of each freshwater and 47 per cent of each terrestrial Key Biodiversity Area was covered by protected areas. Coverage is highest in Europe and Northern America, and lowest in Oceania (excluding Australia and New Zealand). On average, protected area coverage of areas of particular importance for biodiversity, in both terrestrial and freshwater ecosystems globally, continue to grow at approximately the same rate (0.7 per cent per annum). The extent of protected area coverage varies between regions, with Europe and Northern America providing the highest average in both terrestrial and freshwater ecosystems as well as the highest average rate of growth (0.9 per cent and 1 per cent per annum in freshwater and terrestrial ecosystems, respectively). Additionally, mean protected area coverage of both freshwater and terrestrial Key Biodiversity Areas in North Africa and West Asia has more than doubled since 2000. All regions continue to increase the extent to which they officially protect areas of importance for biodiversity, and hence continue to increase the critical natural capital that supports human well-being and the resilience of communities.

Forest area annual net change rate (SDG 15.2.1)

Change in a positive direction

Progress towards sustainable forest management.



Source: UNSD 2015
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

Among all the sub-regions, South-East Asia and North Africa have presented worsening trends, with forest net change rate decreasing from -0.234 per cent to -0.36 per cent and -0.095 per cent to -0.559 per cent, respectively, between 2010 and 2015. On the other hand, while West Africa has recorded a -0.95 per cent net change in forest area in 2015, the highest loss among all sub-regions, the rate of loss has decreased from -0.963 per cent in 2005 to -1.022 per cent in 2010. As a contrast with indicator 15.1.1, indicator 15.2.1 on forest area net change rate is particularly useful in highlighting regions and countries with very high percentage loss, as well as trends of forest loss that are narrowing or widening. It is also possible to analyse forest area net change rate down to the country level. While most policy attention goes to countries with large tropical forest areas such as Brazil, Democratic Republic of Congo and Indonesia, these countries are not those with the highest annual net change rates. Countries with the highest annual net change rates in the period from 2010 to 2015 are Togo (-8.11 per cent), Uganda (-5.48 per cent), Nigeria (-5.01 per cent), Pakistan (-2.69 per cent), and Honduras (-2.43 per cent).

Land degradation (SDG 15.3.1)

Data will be available in the 2019 Global SDG reports and database

Proportion of land that is degraded over total land area.

Global map of land productivity trends

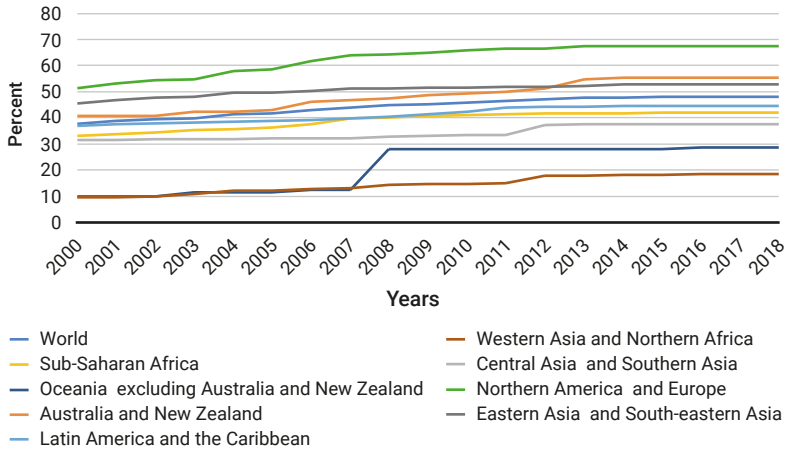
Source: Williams 2016
Tier II; Custodian agency: United Nations Convention to Combat Desertification (UNCCD)

Land degradation is defined as "the reduction or loss of the biological or economic productivity and complexity of rain fed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from a combination of pressures, including land use and management practices". Land productivity monitors land degradation processes and reflects the overall capacity of land to support biodiversity and provide ecosystem services. The degradation of soil and land continues due to heighten competition for land use, undermining the long-term security and development of all countries. From 1999 to 2013, approximately one-fifth of the Earth's land surface covered by vegetation showed persistent and declining trends in productivity, primarily due to poor land and water management. Globally, up to 24 million km^2 of land are affected (an area the size of China, India, and the U.S. combined), including 19% of cropland, 16% of forest land, 19% of grassland, and 28% of rangeland. South America and Africa are most affected by diminished productivity where, in some dryland areas, advanced stages of land degradation are leading to desertification. Reversing these worrying trends through sustainable land management is key to improving the livelihoods and resilience of over 1.3 billion people living off degraded lands.

Mountain protected areas (SDG 15.4.1)

Change in a positive direction

Coverage by protected areas of important sites for mountain biodiversity.



Source: UNEP 2018
Tier I; Custodian agency: UN Environment World Conservation Monitoring Centre (UNEP-WCMC), BirdLife International (BLI) and International Union for Conservation of Nature (IUCN)

The degree to which important sites for mountain biodiversity are covered by protected areas continues to increase, with mean protected area coverage reaching 48 per cent in January 2018, a 10 per cent increase since 2000. Protected area coverage of important sites for mountain biodiversity varies between regions, being highest in Europe and Northern America, and lowest in North Africa and West Asia. The proportion of mountain sites of particular importance for biodiversity covered by protected areas continues to increase at an average annual rate of 0.6 per cent globally. However, protected area coverage of these sites is not evenly distributed, being highest in Europe and Northern America, with 68 per cent of each important site covered by protected areas on average, and lowest in North Africa and West Asia (18.4 per cent). Oceania is the region with the fastest growth in protected area coverage of mountain Key Biodiversity Areas (one per cent change per annum on average) as well as the largest overall increase since 2000 (19 per cent). Mountains have unique biodiversity values and play an important function in regulating climate, as well as having multiple other ecosystem and cultural values that benefit people.

Mountain green cover (SDG 15.4.2)

Too little data

Mountain Green Cover Index

Source: Food and Agriculture Organization (FAO 2018)
Tier I; Custodian agency: Food and Agriculture Organization (FAO)

As of 2017, 76 percent of the world's mountain areas were covered by a form of green vegetation, including forests, shrubs, grassland, and cropland. Across regions, mountain green cover was lowest in North Africa and West Asia, with only 60 percent, and highest in Oceania, with 96 per cent. In most cases, the green coverage of mountain areas is associated with their state of health and to their capacity to fulfil their ecosystem roles (United Nations Economic and Social Council [ECOSOC] 2018). The Green Cover Index is meant to measure the changes of the green vegetation in mountain areas in order to ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits that are essential for sustainable development.

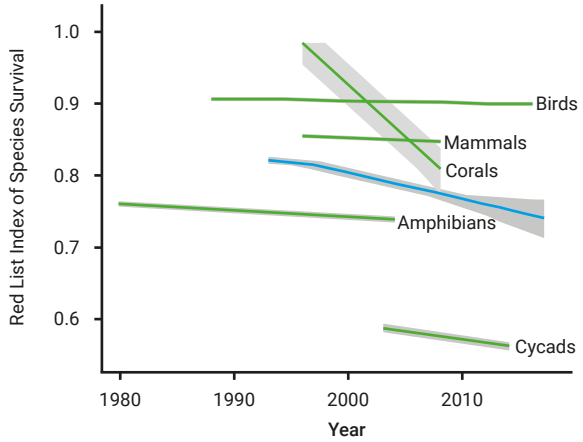
Data collected as a baseline for the Mountain Green Cover Index in 2017 offered a good starting point to provide an adequate measure of the status of conservation of mountain ecosystems through the identification of mountain vegetation changes over time.

Endangered species (SDG 15.5.1)

Change in a negative direction

Red list index.

Red List Index of species survival for birds, mammals, amphibians, corals and cycads, and an aggregate (in blue) for all species (The shading denotes 95 percent confidence intervals).



Source: IUCN (2017a), Hoffman et al. (2018).
Tier I; Custodian agency: International Union for Conservation of Nature (IUCN)

The Red List Index categorizes the conservation status of major species groups based on the risk of extinction (from Least Concern to Extinct) and measures trends in the proportion of species expected to remain extant in the near future without additional conservation action. The Index shows that all species groups with known trends are deteriorating in status, as more species move towards extinction than away from it. The evidence suggests an increase in risk of extinction for all groups individually and as an aggregate from 1993 to 2017. According to the IUCN's latest estimates, cycad species face the greatest risk of extinction with 63 per cent of species in this plant group considered threatened (International Union for Conservation of Nature Commission on Ecosystem Management [IUCN] 2017). The most threatened group of vertebrates are amphibians (41 per cent). Among well sampled invertebrate groups, reef-forming corals have the highest proportion (33 per cent) of species under threat.

Strategies for sharing biodiversity benefits (SDG 15.6.1)

Change in a positive direction

Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits.

Source: Geoff Whalan, 2017 (Flickr)
Tier I; Custodian agency: Secretariat of the Convention on Biological Diversity (CBD)

The Nagoya Protocol is the main legal instrument providing a transparent framework for the fair and equitable sharing of benefits arising from the use of genetic resources (Secretariat of the Convention on Biodiversity [CBD] 2014). The Protocol applies to genetic resources and associated traditional knowledge covered in the Convention on Biological Diversity (CBD) and to the benefits arising from their utilisation. A total of 109 countries have ratified the protocol, with Afghanistan, Austria, Central African Republic, and Palau being the latest countries to join (Lebada 2018). Germany, Malta, and Qatar published their reports on the use of genetic resources under the Nagoya Protocol in 2018. The Access and Benefit-sharing Clearing-House (ABSCH) is a platform allowing countries to share information on procedures for accessing genetic resources and monitor the utilisation of the resources along the value chain which enhances the legal certainty and transparency that both providers and users of genetic resources desire (CBD 2017a). As of November 2018, the ABSCH lists 315 legislative, administrative, or policy measures adopted at the domestic level to implement the access and benefit-sharing obligations of the CBD or/and the Nagoya Protocol (CBD 2017b). However, these measures are not equally split among countries: in 2012, only 26 countries had reported legislative measures to the ABSCH to implement the Nagoya Protocol.

Trade in poached of illicitly trafficked wildlife (SDG 15.7.1)

No data available

Proportion of traded wildlife that was poached or illicitly trafficked.

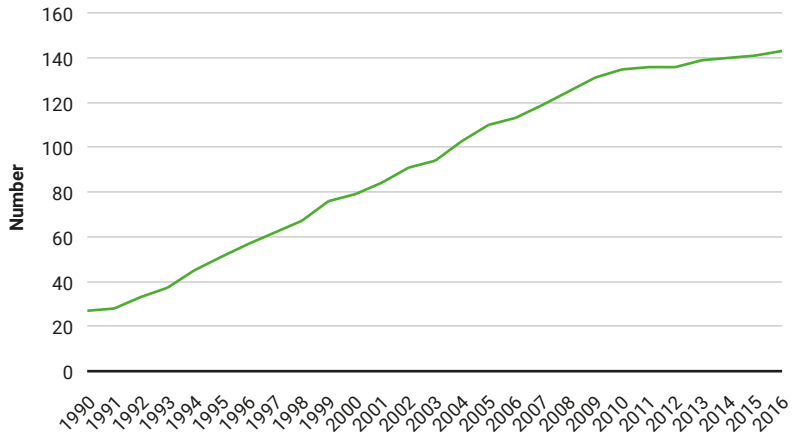
Source: Peter Prokosch, 2015 (GRID-Arendal)
Tier II; Custodian agency: United Nations Office on Drugs and Crime (UNODC) and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Ninety-five percent of the countries that responded to the rapid survey for Africa Asia-Pacific (2017) and Central and West Africa (2018) Symposiums have legislation and/or regulations for preventing, detecting, and penalizing illegal trade in protected wildlife and forest products (United Nations Inter-Agency Task Force on Illicit Trade in Wildlife and Forest Products [Task Force] 2017; Task Force 2018) . Eighty-three percent of these countries use wildlife, game, hunting law and regulations, 70 per cent use specialised laws and regulations relating to the Convention on the International Trade in Endangered Species of Wild Fauna and Flora, 90 per cent use forest law and regulations, 73 per cent use import and export laws and regulation, 63 per cent use biodiversity laws and regulations, 65 per cent use their penal codes, 68 per cent use protected species laws and regulations, 60 per cent use customs laws, and 70 per cent use protected areas laws and regulation. One hundred percent of the legal frameworks of the respondent countries require or enable authorities to involve communities in developing, implementing, and benefiting from policies and laws that ensure sustainable use of natural resources. Seventy percent of these legal frameworks provide financial and/or other support to communities to raise awareness.

Strategies for preventing invasive alien species (SDG 15.8.1)

No data available

Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species.



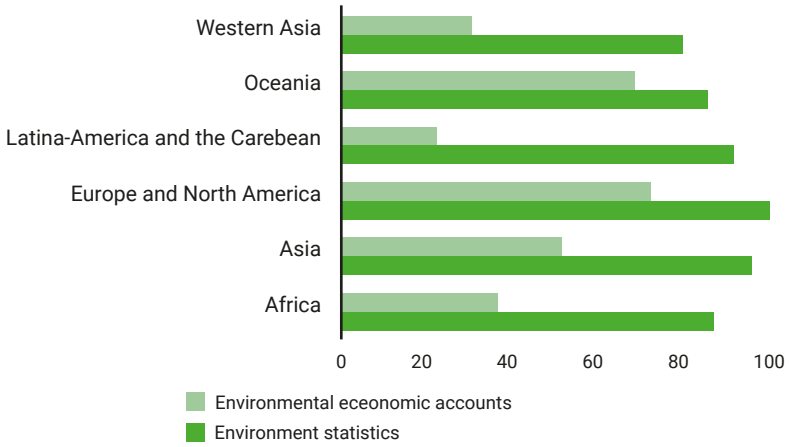
Source: The Sustainable Development report 2018 (UN 2018c)
Tier II; Custodian agency: International Union for Conservation of Nature (IUCN)

Invasive alien species (e.g. plants, animals, fungi, and microorganisms) are recognised as one of the most serious causes of biodiversity loss and decline, after habitat loss (UN 2018c). This indicator is to be achieved by 2020. Although the Metadata have already been developed, cumulative data for this indicator is not yet available. The data compiling agencies (International Union for Conservation of Nature (IUCN), Species Survival Commission and Invasive Species Specialist Group) are in the process of making data available for global, regional, and national use. According to the Sustainable Development Report 2018, the cumulative number of countries reporting to the CBD on national legislation relevant to the prevention or control of invasive alien species has been on a steady increase since 1990, with a 19 percent increase since 2010. However, it is not clear if national legislation has a positive correlation with the national allocation of resources towards the prevention or control of invasive alien species. The report equally states that over 88 per cent of 81 countries surveyed in 2017 have a government department or national agency responsible for managing invasive species; however, over a third of these countries have no allocated budget for this effort and have not accessed any global mechanism to seek funding.

Progress towards Aichi Biodiversity Target 2 (SDG 15.9.1)

No data available

Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020.



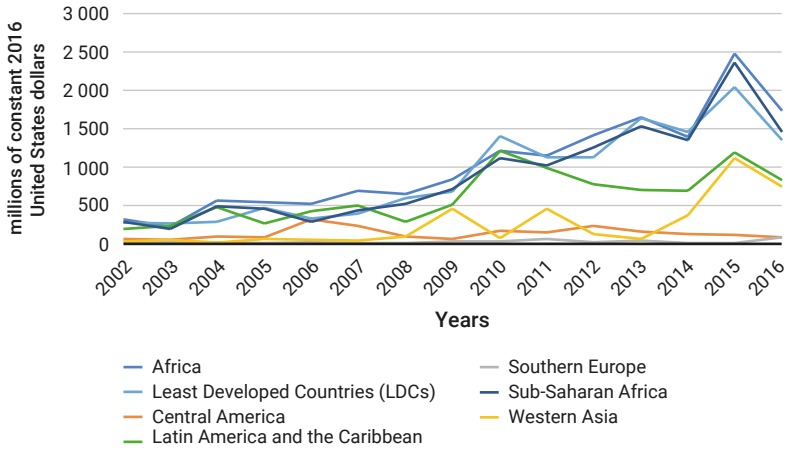
Source: UNCTAD 2007
Tier III; Custodian agency: Secretariat of the Convention on Biological Diversity (CBD) and United Nations Environment Programme (UNEP)

The Aichi Target 2 requires that biodiversity values be integrated into national and local development poverty reduction strategies and planning processes and be incorporated into national accounting, as appropriate, and reporting systems (UNEP 2015). As of November 2016, only four countries (Congo, Finland, Georgia, and Guinea) had their national targets commensurate with the Aichi Target 2; and only Guinea-Bissau had its national targets exceed the Aichi Target 2 (CBD 2016). As an overall conclusion, it can be said that the values of biodiversity are not widely reflected in decision making (Rode, Wittmer and Watfe 2012). There is a lack of global indicator monitoring progress towards this target under the CBD-mandated Biodiversity Indicators Partnership (The Biodiversity Indicators Partnership [BIP] 2018). Additionally, no data have been reported in the SDG-tracker platform (Ritchie and Mispy 2018). Several main recommendations of the TEEB Synthesis Report relate to Aichi Target 2: (1) make nature's value visible, (2) measure better to manage better, and (3) integrate into policy human dependence on ecosystem services as a lifeline for many poor households.

Investment in biodiversity and ecosystems (SDG 15.a.1)

Change in a positive direction

Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems.



Source: UNSD 2016
Tier I/III; Custodian agency: Organisation for Economic Co-operation and Development (OECD), United Nations Environment Programme (UNEP) and World Bank

ODA for biodiversity has increased worldwide by 357.7 per cent from 2002 to 2016. Assistance has been addressed in greater proportions to African and LDCs from 2009 to 2016. At its peak in 2016, African countries and LDCs obtained $2.5 billion and $2 billion, respectively. Investments in Western Asia have also steeply increased from less than $100 million in 2013 to over $1 billion in 2015. In 2015, the main donor countries were Australia and countries in North America and Western Europe. Countries receiving over $500 million 2015-valued-USD in that same year were Iraq, Turkey, Ukraine, DRC, and Colombia (Ritchie and Mispy 2018).

Investment in sustainable forests (SDG 15.b.1)

No data available

Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems.

Source: Peter Prokosch, 2014 (GRID-Arendal)
Tier I/III; Custodian agency: Organisation for Economic Co-operation and Development (OECD), United Nations Environment Programme (UNEP) and World Bank

Covering nearly a third of all land on Earth, forests are essential for livelihoods, species, soil and water conservation, as well as carbon capture and storage. Since 1990, the world has lost 129 million hectares of forests due to agricultural expansion, conversion to pasture land, infrastructure development, destructive logging and fires. At the current rate, 13 million hectares of forests are being lost every year. (UNEP 2018e). Albeit nearly 15 per cent of land is currently under protection, biodiversity is still at risk (World Bank 2018). The Forest Investment Program (FIP) is funded by the Strategic Climate Fund, one of the two Climate Investment Funds (CIF). FIP is designed to increase investments to help countries reduce greenhouse gas emissions from deforestation and forest degradation (REDD), and promote improved sustainable management of forests, leading to emission reductions and the protection of carbon reservoirs. As of 2018, 3.5 million hectares of land covered under sustainable land management practice or other FIP interventions, with a target fixed at 31 million hectares (Climate Investment Fund [CIF] 2017). CIF reports that FIP countries are making "good progress" – without quantifying it – towards enhanced biodiversity through forest loss reduction, forest conservation, and payment for ecosystem services. Overall, there is tangible progress towards mobilising resources to invest in sustainable forests.

Protection against poaching, trafficking and trade (SDG 15.c.1)

No data available

Proportion of traded wildlife that was poached or illicitly trafficked.

Source: Peter Prokosch, 2016 (GRID-Arendal)
Tier II; Custodian agency: United Nations Office on Drugs and Crime (UNODC) and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

This indicator is described under SDG 15.7.1

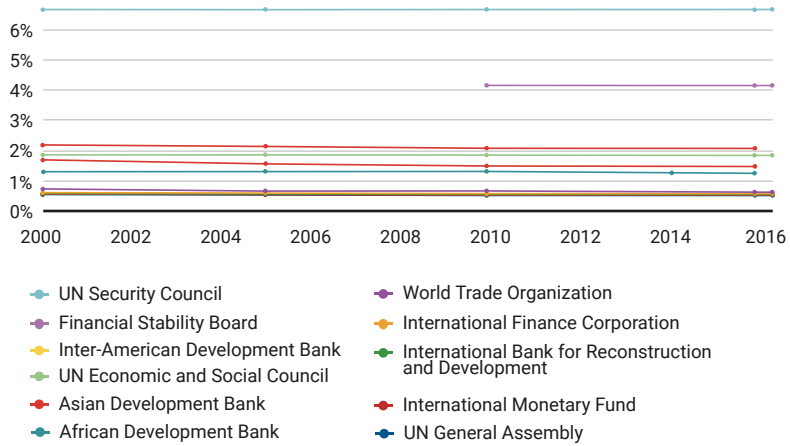
SDG 16: Peace and justice

Participation in global governance (SDG 16.8.1)

Too little data

Proportion of members and voting rights of developing countries in international organisations.

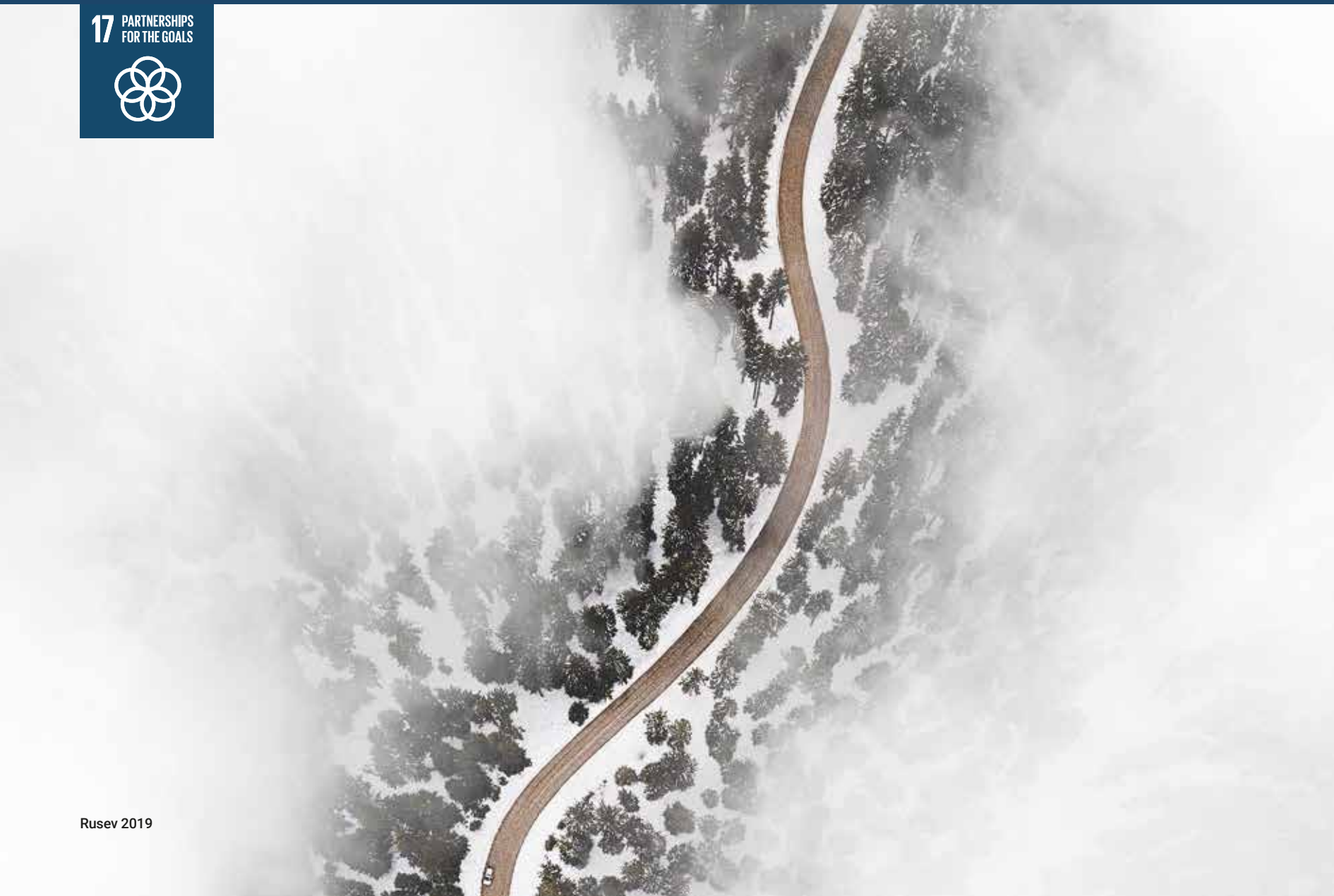
Share of members of international organizations defined as developing countries. Membership in their institutions are agreed by the Member States themselves. There will be only smal changes over time to reflect agreement on new States joining as Members of membership withdrawal.



Source: UNSD 2016
Tier I; Custodian agency: Financing for Development Office, DESA (FFDO)

The participation of developing countries in institutions of global governance is important as it may influence the inclusion of environment as an area of strategic importance in national policies. For example, environment is one of the five core areas of operations and environmental sustainability, as a strategic agenda and area of work, is increasingly integrated across Asian Development Bank (ADB) operations and forms an important part of ADB's assistance programs (ADB, 2018). The African Bank's environmental policy was approved by the Board in 1990. The importance of the environment evolved from the ADF-VI Lending Policy to a central pillar of development in the ADF-VIII Lending Policy. In that respect, the implementation of the Bank's Environmental Policy is of prime importance as one of the leading instruments of change in its Regional Member Country constituency (AfDB, 2000). The Inter-American Development Bank helps member countries address environmental challenges by financing activities to improve the management of protected areas, generate income opportunities for communities that depend on ecosystem services, manage coastal and marine resources, and support climate change and disaster risk management initiatives in critical watersheds (IADB, accessed 21/12/2018) (Inter-American Development Bank [IADB] 2018).

SDG 17: Partnerships and means of implementation



Rusev 2019

Science and technological cooperation (SDG 17.6.1)

No data available

Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation.

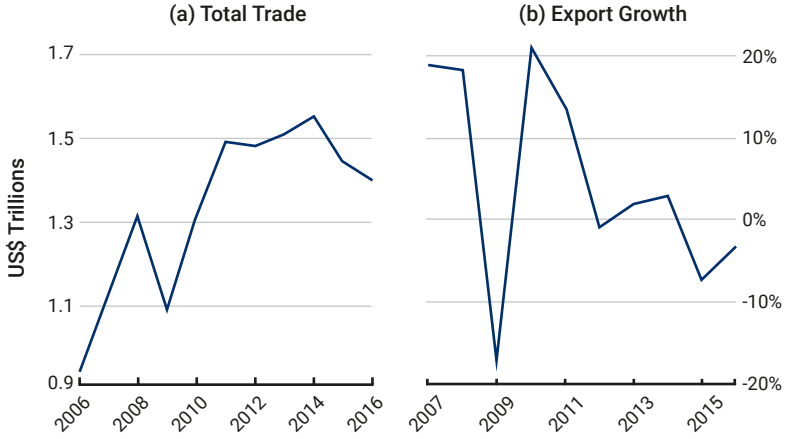
Source: United States Mission Geneva, 2014 (Flickr)
Tier III; Custodian agency: UNESCO Institute for Statistics (UIS)

Since the SDGs were adopted in 2015, the number of agreements and programmes that allow for targeted science and/or technology cooperation has increased considerably. This has happened especially in North-South, South-South, triangular regional, and international cooperation. Such cooperative programmes and agreements focus on topics like knowledge-sharing and access to science, technology, and innovation. The coordination among mechanisms already in place is one of the key nexus areas to focus on at the multilateral level in the run up towards 2030 – an example of such a nexus area being the synergies sought between various MEAs that address biodiversity: the CBD, the Convention on Conservation of Migratory Species, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Ramsar Convention on Wetlands, and the World Heritage Convention, among others. Another central piece of this indicator refers to the need for a global technology facilitation mechanism. Due to the lack of information on the global situation on this indicator, or its current state, still little is known about progress towards SDG target 17.6. It is hoped that soon countries will agree on the methodology and datasets to be used to evaluate progress towards achieving the global target of knowledge sharing and cooperation for access to science, technology, and innovation.

Funding for environmentally sound technologies (SDG 17.7.1)

No data available

Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies.



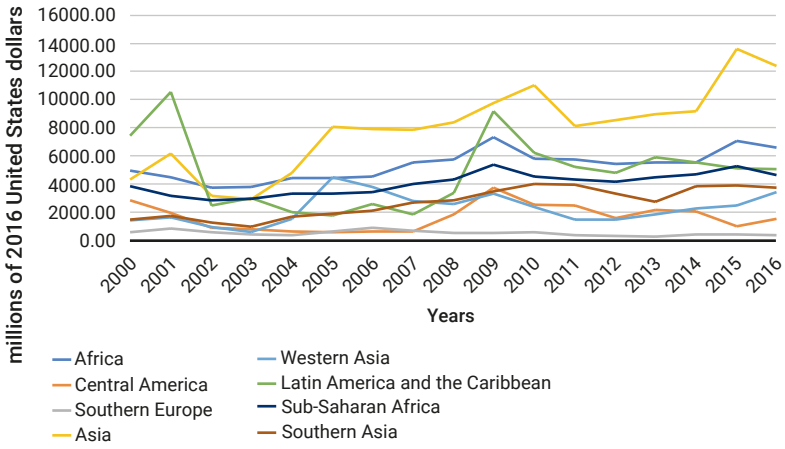
Source: UNEP 2019e[cl]
Tier III; Custodian agency:

Recently there has been an uptake of trade in Environmentally Sound Technologies (ESTs) globally. Global trade of ESTs has increased in the last decade, from $0.9 trillion in 2006 to around $1.4 trillion in 2016. Trade flows largely involved developed countries (more than half) and BRIC countries (about one-fourth) in 2016. China's imports and exports accounted for 71% and 93%, respectively, of BRIC's trade. From 2006 to 2016, developing countries accounted for a small, yet increasing, contribution to the world imports of ESTs. Imports increased from $0.07 trillion to $0.13 trillion, yet represented a lower share of world imports, 20% in 2006 and 18% in 2016. Developing countries as a group doubled the volumes of exports in ESTs since 2006, while in monetary terms, exports remain unchanged at $0.06 trillion. Between 2006 and 2016, LDCs only accounted for a minor fraction of global ESTs total trade, although increasing by more than $20 billion during that time frame. Renewable energy technologies comprise the most important flow of ESTs trade, accounting for more than $609 billion in 2011 at its peak, and $503 billion in 2016, suggesting a share of about 36% of total ESTs trade. Wastewater management and water treatment, in the second place, accounts for slightly less than $300 billion.

Funding for capacity building (SDG 17.9.1)

Change in a positive direction

Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries.



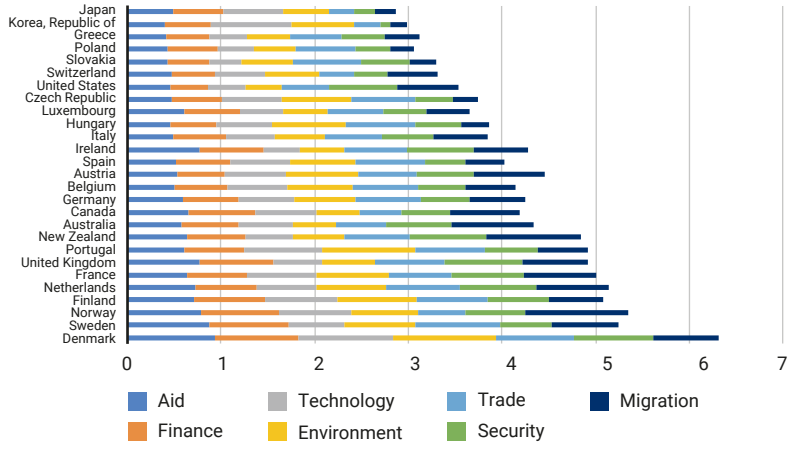
Source: UNSD 2016
Tier I; Custodian agency: Organisation for Economic Co-operation and Development (OECD)

Sub-Saharan Africa was the biggest recipient of the net ODA in 2016, accounting for more than 28 percent of ODA receipts. Total ODA specifically allotted for capacity-building and national planning amounted to $20.4 billion, of which Latin America and the Caribbean received $5.1 billion, Sub-Saharan Africa received $4.6 billion, and Southern Asia received $3.8 billion. The three main sectors assisted were the environment, energy, and public administration, which received a combined $10.2 billion (ECOSOC 2018). However, the share of ODA allocated for statistical capacity-building remains low, despite growing demands. This amount represents approximately only 0.3 percent of the total ODA, a percentage far less than what is necessary for countries in developing regions to implement and monitor their development agendas (UN 2018c); and more specifically to overcome the challenges faced in the implementation and monitoring of the environmental dimension of the SDGs. Continued and increased technical and financial support is needed to ensure implementation of effective and targeted capacity-building in developing countries to support national plans to achieve all the SDGs.

Mechanisms for enhancing policy coherence (SDG 17.14.1)

No data available

Number of countries with mechanisms in place to enhance policy coherence of sustainable development.



Source: UNCTAD 2015
Tier III; Custodian agency: United Nations Environment Programme (UNEP)

Enhancing policy coherence for sustainable development is important for achieving sustainable development in its three dimensions (economic, social and environmental) in a balanced and integrated manner; for ensuring coherence between policies at various levels of government; for ensuring that policies in different sectors are mutually supportive and do not work against each other; and for addressing the impacts of domestic policy internationally. Even though no comparable data on existing mechanisms are available today, many countries already have a wide variety of mechanisms in place that enhance policy coherence for sustainable development. Examples of existing mechanisms include inter-ministerial coordination mechanisms, strategies on policy coherence for sustainable development, a commissioner for future generations, mechanisms allowing participation of relevant stakeholders, etc. Currently, the developed methodology consists of a framework for a composite indicator combining several sub-indicators including explanatory guidance notes per sub-indicator. This approach addresses the complexity and variety of mechanisms that exist in the countries.

Annex 1

Environment relevant SDG targets and indicators in the SDG Global Indicator Framework

Note: Indicators for which UN Environment is Custodian Agency are marked in blue font.

Goal	Target	Indicator	Tier Classification
Goal 1. End poverty in all its forms everywhere	1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.2 Proportion of total adult population with secure tenure rights to land, with legally recognised documentation and who perceive their rights to land as secure, by sex and by type of tenure	Tier II
	1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	Tier II
		1.5.2 Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)	Tier II
		1.5.3 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	Tier I
		1.5.4 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	Tier II
Goal 2. End hunger achieve food security and improved nutrition and promote sustainable agriculture	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	Tier II
	2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities	Tier I
		2.5.2 Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction	Tier I

Goal	Target	Indicator	Tier Classification
Goal 3. Ensure healthy lives and promote well-being for all at all ages	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.1 Mortality rate attributed to household and ambient air pollution	Tier I
		3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	Tier I
		3.9.3 Mortality rate attributed to unintentional poisoning	Tier I
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (1/1/0)	4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment	Tier III
Goal 5. Achieve gender equality and empower all women and girls	5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure	Tier II
Goal 6. Ensure availability and sustainable management of water and sanitation for all	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services	Tier II
	6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated	Tier II
		6.3.2 Proportion of bodies of water with good ambient water quality	Tier II
	6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1 Change in water-use efficiency over time	Tier II
		6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	Tier I
	6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management implementation (0-100)	Tier I
		6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	Tier I
	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time	Tier I

Goal	Target	Indicator	Tier Classification
	6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	Tier I
	6.b Support and strengthen the participation of local communities in improving water and sanitation management	6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	Tier I
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	7.1.2 Proportion of population with primary reliance on clean fuels and technology	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Tier I
	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	Tier I
	7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP	Tier I
	7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	7.a.1 International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems	Tier II
	7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	7.b.1 Investments in energy efficiency as a proportion of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services	Tier III
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP	Tier III
		8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	Tier I
	8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	8.9.2 Proportion of jobs in sustainable tourism industries out of total tourism jobs	Tier III
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO_2 emission per unit of value added	Tier I

Goal	Target	Indicator	Tier Classification
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	Tier II
	11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate	Tier II
		11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	Tier II
	11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)	Tier III
	11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	Tier II
		11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters	Tier II
	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities	Tier II
		11.6.2 Annual mean levels of fine particulate matter (e.g. $PM_{2.5}$ and PM_{10}) in cities (population weighted)	Tier I
	11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	Tier II
	11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	11.b.1 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	Tier I
		11.b.2 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	Tier II

Goal	Target	Indicator	Tier Classification
	1.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials	Tier III
Goal 12. Ensure sustainable consumption and production patterns	12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries	12.1.1 Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies	Tier II
	12.2 By 2030, achieve the sustainable management and efficient use of natural resources	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP	Tier III
		12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	Tier I
	12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	12.3.1 (a) Global food loss index and (b) food waste index	Tier II (a)/ Tier III (b)
	12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment	12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement	Tier I
		12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	Tier III
	12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	12.5.1 National recycling rate, tons of material recycled	Tier III
	12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	12.6.1 Number of companies publishing sustainability reports	Tier III
	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	12.7.1 Number of countries implementing sustainable public procurement policies and action plans	Tier III
	12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	Tier III

Goal	Target	Indicator	Tier Classification
	12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	12.a.1 Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies	Tier III
	12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	12.b.1 Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools	Tier III
	12.c Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities	12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels	Tier II
Goal 13. Take urgent action to combat climate change and its impacts	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	Tier II
		13.1.2 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	Tier I
		13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	Tier II
	13.2 Integrate climate change measures into national policies, strategies and planning	13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)	Tier III
	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula	Tier III
		13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions	Tier III

Goal	Target	Indicator	Tier Classification
	13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalise the Green Climate Fund through its capitalization as soon as possible	13.a.1 Mobilised amount of United States dollars per year between 2020 and 2025 accountable towards the $100 billion commitment	Tier III
	13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalised communities	13.b.1 Number of least developed countries and small island developing States that are receiving specialised support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalised communities	Tier III
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development	14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	14.1.1 Index of coastal eutrophication and floating plastic debris density	Tier III
	14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches	Tier III
	14.3 Minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations	Tier II
	14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels	Tier I
	14.5 By 2020, conserve at least 10 percent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	14.5.1 Coverage of protected areas in relation to marine areas	Tier I
	14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation	14.6.1 Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	Tier II

Goal	Target	Indicator	Tier Classification
	14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	14.7.1 Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	Tier III
	14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	14.a.1 Proportion of total research budget allocated to research in the field of marine technology	Tier II
	14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want"	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	Tier III
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area	Tier I
		15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	Tier I
	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management	Tier I
	15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1 Proportion of land that is degraded over total land area	Tier II
	15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.1 Coverage by protected areas of important sites for mountain biodiversity	Tier I
		15.4.2 Mountain Green Cover Index	Tier I
	15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.5.1 Red List Index	Tier I

Goal	Target	Indicator	Tier Classification
	15.6 Promote fair and equitable sharing of the benefits arising from the utilisation of genetic resources and promote appropriate access to such resources, as internationally agreed	15.6.1 Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits	Tier I
	15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	15.7.1 Proportion of traded wildlife that was poached or illicitly trafficked	Tier II
	15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	15.8.1 Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species	Tier II
	15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	Tier III
	15.a Mobilise and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	15.a.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	Tier I/III
	15.b Mobilise significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	15.b.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	Tier I/III
	15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	15.c.1 Proportion of traded wildlife that was poached or illicitly trafficked	Tier II
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance	16.8.1 Proportion of members and voting rights of developing countries in international organisations	Tier I

Goal	Target	Indicator	Tier Classification
Goal 17. Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development	17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	17.6.1 Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation	Tier III
	17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	17.7.1 Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies	Tier III
	17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation	17.9.1 Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries	Tier I
	17.14 Enhance policy coherence for sustainable development	17.14.1 Number of countries with mechanisms in place to enhance policy coherence of sustainable development	Tier III
Total	**72**	**93**	

Annex 2

The SDG Regional Groupings[2]

Central & Southern Asia

Central Asia: Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan
Southern Asia: Afghanistan; Bangladesh; Bhutan; India; Iran (Islamic Republic of); Maldives; Nepal; Pakistan; Sri Lanka

Eastern and South-eastern Asia

Eastern Asia: China; China, Hong Kong SAR; China, Macao SAR; Democratic People's Republic of Korea; Japan; Mongolia; Republic of Korea
South-eastern Asia: Brunei Darussalam; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Myanmar; Philippines; Singapore; Thailand; Timor-Leste; Viet Nam

Europe and Northern America

Northern America: Bermuda; Canada; Greenland; United States of America
Europe
Eastern Europe: Belarus; Bulgaria; Czech Republic; Hungary; Poland; Republic of Moldova; Romania; Russian Federation; Slovakia; Ukraine
Northern Europe: Åland Islands; Channel Islands; Denmark; Estonia; Faroe Islands; Finland; Iceland; Ireland; Isle of Man; Latvia; Lithuania; Norway; Sweden; United Kingdom of Great Britain and Northern Ireland;
Southern Europe: Albania; Andorra; Bosnia and Herzegovina; Croatia; Greece; Italy; Malta; Montenegro; Portugal; San Marino; Serbia; Slovenia; Spain; The former Yugoslav Republic of Macedonia
Western Europe: Austria; Belgium; France; Germany; Liechtenstein; Luxembourg; Monaco; Netherlands; Switzerland

Latin America & the Caribbean

Caribbean: Anguilla; Antigua and Barbuda; Aruba; Bahamas; Barbados; Bonaire, Sint Eustatius and Saba; British Virgin Islands; Cayman Islands; Cuba; Curaçao; Dominica; Dominican Republic; Grenada; Guadeloupe; Haiti; Jamaica; Martinique; Montserrat; Puerto Rico; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Sint Maarten (Dutch part); Suriname; Trinidad and Tobago; Turks and Caicos Islands; United States Virgin Islands
Central America: Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama
South America: Argentina; Belize; Bolivia (Plurinational State of); Brazil; Chile; Colombia; Ecuador; Falkland Islands (Malvinas); French Guiana; Guyana; Paraguay; Peru; South Georgia & the South Sandwich Islands; Uruguay; Venezuela (Bolivarian Republic of)

Northern Africa and Western Asia

Northern Africa: Algeria; Egypt; Libya; Morocco; Sudan; Tunisia; Western Sahara
Western Asia: Armenia; Azerbaijan; Bahrain; Cyprus; Georgia; Iraq; Israel; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; State of Palestine; Syrian Arab Republic; Turkey; United Arab Emirates; Yemen

Oceania

Australia and New Zealand: Australia; Christmas Island; Cocos (Keeling) Islands; Heard Island & McDonald Islands; New Zealand; Norfolk Island

Oceania excluding Australia and New Zealand
Melanesia: Fiji; New Caledonia; Papua New Guinea; Solomon Islands; Vanuatu
Micronesia: Guam; Kiribati; Marshall Islands; Micronesia (Federated States of); Nauru; Northern Mariana Islands; Palau
Polynesia: American Samoa; Cook Islands; French Polynesia; Niue; Pitcairn; Samoa; Tokelau; Tonga; Tuvalu; Wallis and Futuna Island

Sub-Saharan Africa

Sub-Saharan Africa: Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; Congo; Côte d'Ivoire; Democratic Republic of the Congo; Djibouti; Equatorial Guinea; Eritrea; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Mayotte; Mozambique; Namibia; Niger; Nigeria; Réunion; Rwanda; Sao Tome and Principe; Senegal; Seychelles; Sierra Leone; Somalia; South Africa; South Sudan; Sudan; Swaziland; Tanzania; Togo; Uganda; Zambia; Zimbabwe

2 Based on the official SDG regions: https://unstats.un.org/sdgs/indicators/regional-groups/. Data for all regional and sub-regional groupings is available for download from the Environment Live Platform (https://environmentlive.unep.org).

Annex 3

Original Data sources

Data in the UN Environment Live database and in the Global SDG Indicators Database are based on data from a variety of UN entities and other sources. This Annex will include an elaboration of all data which were used to produce the graphics in this report. All indicators presented in this report are also available on the Environment Live website (environmentlive.unep.org). Full information on the sources of data, the metadata, the aggregation procedures and the update schedule can be found on that site. The below is a list of the original sources that have been used to develop the Environment Live Global database on Environment Live.

Access and Benefit-Sharing Clearing-House (https://absch.cbd.int), **Secretariat of the Convention on Biological Diversity**
Countries that have legislative, administrative and policy framework or measures reported to the Access and Benefit-Sharing Clearing-House (1 = YES; 0 = NO) (15.6.1): The indicator is defined as the number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits. It refers to the efforts by countries to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2010) and the International Treaty on Plant Genetic Resources for Food and Agriculture (2001).

AQUASTAT (http://www.fao.org/nr/aquastat), **Food and Agriculture Organization of the United Nations (FAO)**
Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (%) (6.4.2): The ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after taking into account environmental water requirements. Main sectors, as defined by ISIC standards, include agriculture; forestry and fishing; manufacturing; electricity industry; and services. This indicator is also known as water withdrawal intensity.

Creditor Reporting System (https://stats.oecd.org), **World Health Organization (WHO), United Nations Environment Programme (UNEP), Organisation for Economic Cooperation and Development (OECD)**
Total official development assistance (gross disbursement) for water supply and sanitation, by recipient countries (millions of constant 2016 United States dollars) (6.a.1): Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan is defined as the proportion of total water and sanitation-related Official Development Assistance (ODA) disbursements that are included in the government budget.

Total official development assistance for biodiversity, by donor countries (millions of constant 2016 United States dollars) (15.a.1, 15.b.1): The Gross disbursements of total ODA from all donors for biodiversity.

Total official development assistance for biodiversity, by recipient countries (millions of constant 2016 United States dollars) (15.a.1, 15.b.1): The Gross disbursements of total ODA to all recipients for biodiversity.

Development Finance Data (http://www.oecd.org/dac), **Organisation for Economic Cooperation and Development (OECD)**
Total official development assistance (gross disbursement) for technical cooperation (millions of 2016 United States dollars) (17.9.1): Gross disbursements of total ODA and other official flows from all donors for capacity building and national planning.

Domestic Animal Diversity Information System (http://www.fao.org/dad-is), **Food and Agriculture Organization of the United Nations (FAO)**
Number of local breeds for which sufficient genetic resources are stored for reconstitution (2.5.1): The conservation of animal genetic resources for food and agriculture (GRFA) in medium or long term conservation facilities (ex situ in genebanks) represents the most trusted means of conserving genetic resources worldwide. Animal GRFA conserved in these facilities can be easily used in breeding programmes as well, even directly on-farm. The measure of trends in ex situ conserved materials provides an overall assessment of the extent to which we are managing to maintain and/or increase the total genetic diversity available for future use and thus protected from any permanent loss of genetic diversity which may occur in the natural habitat, i.e. in situ, or on-farm. The two components of the indicator, plant and animal GRFA, are separately counted. The animal component is calculated as the number of local breeds stored within a genebank collection with an amount of genetic material stored which is required to reconstitute the breed (based on the Guidelines on Conservation of Animal Genetic Resources, FAO, 2012).

Proportion of local breeds classified as being at unknown level of risk of extinction (%) (2.5.2): The indicator presents the percentage of livestock breeds classified as being of unknown risk of extinctions at a certain moment in time, as well as the trends for those percentages.

Proportion of local breeds classified as known being at risk (%) (2.5.2): The indicator presents the percentage of livestock breeds classified as being at risk of extinctions at a certain moment in time, as well as the trends for those percentages.

Proportion of local breeds classified as known being not at risk (%) (2.5.2): The indicator presents the percentage of livestock breeds classified as being not at risk of extinctions at a certain moment in time, as well as the trends for those percentages.

Environment Live (https://environmentlive.unep.org/), **United Nations Environment Programme (UNEP)**
Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement (% average value) (12.4.1): The indicator refers to the number of parties (=countries that have ratified, accepted, approved or accessed), to the following Multilateral Environmental Agreements (MEAs): (1) The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention); (2) The Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade (Rotterdam Convention); (3) The Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention); (4) The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol); (5) Minamata Convention on Mercury (Minamata Convention).

Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels (12.c.1): In order to measure fossil fuel subsidies at the national, regional and global level, three sub-indicators are recommended for reporting on this indicator: 1) direct transfer of government funds; 2) induced transfers (price support); and as an optional sub-indicator 3) tax expenditure, other revenue foregone, and underpricing of goods and services. The definitions of the IEA Statistical Manual (IEA, 2005) and the Agreement on Subsidies and Countervailing Measures (ASCM) under the World Trade Organization (WTO) (WTO, 1994) are used to define fossil fuel subsidies. Standardised descriptions from the United Nations Statistical Office's Central Product Classification should be used to classify individual energy products. It is proposed to drop the wording "as a proportion of total national expenditure on fossil fuels" and thus this indicator is effectively "Amount of fossil fuel subsidies per unit of GDP (production and consumption)".

FAO Collect Earth (http://www.openforis.org), **Food and Agriculture Organization of the United Nations (FAO)**
Mountain Green Cover Index (15.4.2): The Green Cover Index is meant to measure the changes of the green vegetation in mountain areas - i.e. forest, shrubs, trees, pasture land, crop land, etc. – in order to monitor progress on the mountain target. The index will provide information on the changes in the vegetation cover and, as such, will provide an indication of the status of the conservation of mountain environments.

FAO Global Forest Resource Assessment (http://www.fao.org/forest-resources-assessment), **Food and Agriculture Organization of the United Nations (FAO)**
Proportion of forest area with a long-term management plan (%) (15.2.1): "Sustainable forest management" (SFM) is a central concept for Goal 15 and target 15.1 as well as for target 15.2. It has been formally defined, by the UN General Assembly, as follows: dynamic and evolving concept [that] aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations" (Resolution A/RES/62/98). The indicator is composed of five sub-indicators that measure progress towards all dimensions of sustainable forest management. The environmental values of forests are covered by three sub-indicators focused on the extension of forest area, biomass within the forest area and protection and maintenance of biological diversity, and of natural and associated cultural resources. Social and economic values of forests are reconciled with environmental values through sustainable management plans. The subindicator provides further qualification to management of forest areas, by assessing areas which are independently verified for compliance with a set of national or international standards.

FAOSTAT (http://www.fao.org/faostat), **Food and Agriculture Organization of the United Nations (FAO)**
Proportion of fish stocks within biologically sustainable levels (not overexploited) (%) (14.4.1): Proportion of fish stocks within biologically sustainable levels measures the sustainability of the world's marine capture fisheries by their abundance. A fish stock of which abundance is at or greater than the level, that can produce the maximum sustainable yield (MSY) is classified as biologically sustainable. In contrast, when abundance falls below the MSY level, the stock is considered biologically unsustainable.

Forest area (thousands of hectares) (15.1.1): Forest area as a proportion of total land area.

Global Environment Monitoring System for Water (GEMS/Water) (https://gemstat.org), **United Nations Environment Programme (UNEP)**
Proportion of bodies of water with good ambient water quality (%) (6.3.2): Ambient water quality refers to natural, untreated water in rivers, lakes and groundwaters and represents a combination of natural influences together with the impacts of all anthropogenic activities. The indicator relies on water quality data derived from in situ measurements and the analysis of samples collected from surface and groundwaters. Water quality is assessed by means of core physical and chemical parameters that reflect natural water quality related to climatological and geological factors, together with major impacts on water quality. The continuous monitoring of all surface and groundwaters is economically unfeasible and not required to sufficiently characterize the status of ambient water quality in a country. Therefore, countries select river, lake and groundwater bodies that are representative and significant for the assessment and management of water quality to monitor and report on indicator 6.3.2. The quality status of individual water bodies is classified based on the compliance of the available water quality monitoring data for the core parameters with target values defined by the country. The indicator is computed as the proportion of the number of water bodies classified as having good quality (i.e. with at least 80 % compliance) to the total number of assessed water bodies, expressed as a percentage.

Global Health Observatory Data Repository (https://www.who.int/gho), **World Health Organization (WHO)**
Age-standardized mortality rate attributed to household and ambient air pollution (deaths per 100,000 population) (3.9.1): The mortality attributable to the joint effects of household and ambient air pollution can be expressed as: Number of deaths, Death rate. Death rates are calculated by dividing the number of deaths by the total population (or indicated if a different population group is used, e.g. children under 5 years). Evidence from epidemiological studies have shown that exposure to air pollution is linked, among others, to the important diseases taken into account in this estimate: (1) Acute respiratory infections in young children (estimated under 5 years of age); (2) Cerebrovascular diseases (stroke) in adults (estimated above 25 years); (3) Ischaemic heart diseases (IHD) in adults (estimated above 25 years); (4) Chronic obstructive pulmonary disease (COPD) in adults (estimated above 25 years); and (5) Lung cancer in adults (estimated above 25 years).

Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (deaths per 100,000 population) (3.9.2): The mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) as defined as the number of deaths from unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe WASH services) in a year, divided by the population, and multiplied by 100,000.

Mortality rate attributed to unintentional poisonings, by sex (deaths per 100,000 population) (3.9.3): The mortality rate attributed to unintentional poisoning as defined as the number of deaths of unintentional poisonings in a year, divided by the population, and multiplied by 100,000.

Annual mean levels of fine particulate matter in cities, urban population (micrograms per cubic meter) (11.6.2): The mean annual concentration of fine suspended particles of less than 2.5 microns in diameters ($PM_{2.5}$) is a common measure of air pollution. The mean is a population-weighted average for urban population in a country and is expressed in micrograms per cubic meter [$\mu g/m^3$].

Global Ocean Science Report (https://en.unesco.org/gosr), **Intergovernmental Oceanographic Commission of UNESCO**
National ocean science expenditure as a share of total research and development funding (%) (14.a.1): Marine technology as defined in the IOCCGTMT refers to instruments, equipment, vessels, processes and methodologies required to produce and use knowledge to improve the study and understanding of the nature and resources of the ocean and coastal areas.

Global Surface Water Explorer (https://global-surface-water.appspot.com/) **United Nations Environment Programme (UNEP)**
Water body extent (permanent and maybe permanent) (% of total land area) (6.6.1): The indicator includes five categories: 1) vegetated wetlands, 2) rivers and estuaries, 3) lakes, 4) aquifers, and 5) artificial waterbodies. For purposes of this methodology, the text refers only to these five ecosystem category terminologies. To address its complexity, Indicator 6.6.1 has been divided into 5 SubIndicators to capture the various data sources and methodologies required for monitoring components of the Indicator. Data sources come from a combination of ground sampling and earth observations. Depending on the type of ecosystem and the type of extent being measured, the data collection methodology can also differ greatly.

INDSTAT (https://stat.unido.org/), **International Energy Agency (IEA), United Nations Industrial Development Organization (UNIDO)**
CO_2 emission per unit of value added (9.4.1): Carbon dioxide (here after, CO_2) emissions per unit value added is an indicator computed as ratio between CO_2 emissions from fuel combustion and the value added of associated economic activities. The indicator can be computed for the whole economy (total CO_2 emissions/GDP) or for specific sectors, notably the manufacturing sector (CO_2 emissions from manufacturing industries per manufacturing value added (MVA). CO_2 emissions per unit of GDP are expressed in kilogrammes of CO_2 per USD constant 2010 PPP GDP. CO_2 emissions from manufacturing industries per unit of MVA are measured in kilogrammes of CO_2 equivalent per unit of MVA in constant 2010 USD.

International Disaster Database (https://www.emdat.be), **United Nations Office of Disaster Reduction (UNISDR)**
Number of directly affected persons attributed to disasters per 100,000 population (number) (1.5.1, 11.5.1, 13.1.1): This indicator measures the number of people who died, went missing or were directly affected by disasters per 100,000 population.

Direct economic loss attributed to disasters relative to GDP (%) (1.5.2, 11.5.2): This indicator measures the ratio of direct economic loss attributed to disasters in relation to GDP.

IWRM Data Portal (http://iwrmdataportal.unepdhi.org), **UN Environment-DHI Center on Water and Environment (UN Environment-HDI)**
Degree of integrated water resources management implementation (%) (6.5.1): The indicator is currently being measured in terms of different stages of development and implementation of Integrated Water Resources Management (IWRM). The definition of IWRM is based on an internationally agreed definition and is universally applicable. IWRM was officially established in 1992 and is defined as “a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.” (GWP 2010).

Material Flows Database (http://www.resourcepanel.org), **United Nations Environment Programme (UNEP), International Resource Panel (IRP)**
Domestic material consumption, by type of raw material (tonnes) (8.4.2, 12.2.2): Domestic Material Consumption (DMC) is a standard material flow accounting (MFA) indicator and reports the apparent consumption of materials in a national economy.

Material footprint (Total) (8.4.1, 12.2.1): Material Footprint (MF) is the attribution of global material extraction to domestic final demand of a country. The total material footprint is the sum of the material footprint for biomass, fossil fuels, metal ores and non-metal ores.

SDG Indicators Global Database (https://unstats.un.org/sdgs/indicators/database), **United Nations Department of Economic and Social Affairs (UN DESA)**

Proportion of transboundary aquifers with an operational arrangement for water cooperation (%) (6.5.2): The proportion of transboundary aquifers area within a country with an operational arrangement for water cooperation. It is derived by adding up the surface area in a country of those transboundary aquifers that are covered by an operational arrangement and dividing the obtained area by the aggregate total area in a country of all transboundary aquifers. The result is multiplied by 100 to obtain it expressed as percentage share.

Proportion of transboundary basins (river and lake basins and aquifers) with an operational arrangement for water cooperation (%) (6.5.2): The proportion of transboundary basins area within a country with an operational arrangement for water cooperation. It is derived by adding up the surface area in a country of those transboundary surface water basins that are covered by an operational arrangement and dividing the obtained area by the aggregate total area in a country of all transboundary basins. The result is multiplied by 100 to obtain it expressed as percentage share.

Proportion of transboundary river and lake basins with an operational arrangement for water cooperation (%) (6.5.2): The proportion of transboundary basins area within a country with an operational arrangement for water cooperation. It is derived by adding up the surface area in a country of those transboundary surface water catchments and transboundary aquifers (i.e. ‘transboundary’ basins) that are covered by an operational arrangement and dividing the obtained area by the aggregate total area in a country of all transboundary basins (both catchments and aquifers). The result is multiplied by 100 to obtain it expressed as percentage share.

Proportion of members of developing countries in international organizations, by organization (%) (16.8.1): The indicator is calculated independently for eleven different international institutions: The United Nations General Assembly, the United Nations Security Council, the United Nations Economic and Social Council, the International Monetary Fund, the International Bank for Reconstruction and

Development, the International Finance Corporation, the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, the World Trade Organisation, and the Financial Stability Board.

Proportion of voting rights of developing countries in international organizations, by organization (%) (16.8.1): The indicator is calculated independently for eleven different international institutions: The United Nations General Assembly, the United Nations Security Council, the United Nations Economic and Social Council, the International Monetary Fund, the International Bank for Reconstruction and Development, the International Finance Corporation, the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, the World Trade Organisation, and the Financial Stability Board.

Sendai Monitor (https://sendaimonitor.unisdr.org), **United Nations Office of Disaster Reduction (UNISDR)**
Score of adoption and implementation of national DRR strategies in line with the Sendai Framework (1.5.3, 11.b.1, 13.1.2): An open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly (resolution 69/284) is developing a set of indicators to measure global progress in the implementation of the Sendai Framework. These indicators will eventually reflect the agreements on the Sendai Framework indicators.

Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (%) (1.5.4, 11.b.2, 13.1.3): The Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted by UN Member States in March 2015 as a global policy of disaster risk reduction. One of the targets is: "Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020". In line with the Sendai Framework for Disaster Risk Reduction 2015-2030, disaster risk reduction strategies and policies should mainstream and integrate disaster risk reduction within and across all sectors, across different timescales and with targets, indicators and time frames. These strategies should be aimed at preventing the creation of disaster risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience.

Number of damaged critical infrastructure attributed to disasters (number) (11.5.2): Direct economic loss: the monetary value of total or partial destruction of physical assets existing in the affected area. Direct economic loss is nearly equivalent to physical damage. An open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly (resolution 69/284) is developing a set of indicators to measure global progress in the implementation of the Sendai Framework. These indicators will eventually reflect the agreements on the Sendai Framework indicators.

Number of disruptions to basic services attributed to disasters (number) (11.5.2): Direct economic loss: the monetary value of total or partial destruction of physical assets existing in the affected area. Direct economic loss is nearly equivalent to physical damage. An open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly (resolution 69/284) is developing a set of indicators to measure global progress in the implementation of the Sendai Framework. These indicators will eventually reflect the agreements on the Sendai Framework indicators.

UN-Global Analysis and Assessment of Sanitation and Drinking-water (GLAAS) (https://www.who.int/water_sanitation_health/monitoring), **World Health Organization (WHO), United Nations Environment Programme (UNEP), Organisation for Economic Cooperation and Development (OECD)**
Proportion of countries with clearly defined procedures in law or policy for participation by service users/communities in planning program in water resources planning and management (6.b.1): The indicator assesses the percentage of local administrative units (as defined by the national government) that have an established and operational mechanism by which individuals and communities can meaningfully contribute to decisions and directions about water and sanitation management. The indicator is currently being measured by the Proportion of countries with clearly defined procedures in law or policy for participation by service users/communities in planning program in water and sanitation management, and hygiene promotion.

Proportion of countries with high level of users/communities participating in planning programs in water resources planning and management (6.b.1): The indicator assesses the percentage of local administrative units (as defined by the national government) that have an established and operational mechanism by which individuals and communities can meaningfully contribute to decisions and directions about water and sanitation management. The indicator is currently being measured by the Proportion of countries with high level of users/communities participating in planning programs in water and sanitation management, and hygiene promotion.

UN-Habitat Urban Data (http://urbandata.unhabitat.org/), **United Nations Human Settlements Programme (UN Habitat)**
Municipal Solid Waste collection coverage, by cities (%) (11.6.1): Proportion of municipal solid waste regularly collected and with adequate treatment and disposal out of total municipal solid waste generated. The goal of this indicator aims to generate the proportion of municipal solid waste regularly collected and that is adequately treated and disposed out of all the total municipal waste generated by the city.

WHO Global Ambient Air Quality Database (https://www.who.int/airpollution/data), **World Health Organization (WHO)**
Annual mean levels of fine particulate matter in cities, urban population (micrograms per cubic meter) (11.6.2): The mean annual concentration of fine suspended particles of less than 2.5 microns in diameters ($PM_{2.5}$) is a common measure of air pollution. The mean is a population-weighted average for urban population in a country and is expressed in micrograms per cubic meter [$\mu g/m^3$].

WHO/UNICEF Joint Monitoring Program (https://washdata.org), **World Health Organization (WHO), United Nations International Children's Fund (UNICEF)**
Proportion of population using safely managed drinking water services, by urban/rural (%) (6.1.1): Proportion of population using safely managed drinking water services is currently being measured by the proportion of population using an improved basic drinking water source which is located on premises, available when needed and free of faecal (and priority chemical) contamination. 'Improved' drinking water sources include: piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tubewells; protected dug wells; protected springs; packaged water; delivered water and rainwater.

World Database on Protected Areas (https://www.protectedplanet.net/), **United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), BirdLife International (BLI), International Union for Conservation of Nature (IUCN)**
Protected marine area (Exclusive Economic Zones) (square kilometres) (14.5.1): Coverage of protected areas in relation to marine areas shows temporal trends in the mean percentage of each important site for marine biodiversity (i.e., those that contribute significantly to the global persistence of biodiversity) that is covered by designated protected areas.

Average proportion of Terrestrial Key Biodiversity Areas (KBAs) covered by protected areas (%) (15.1.2): Proportion of important sites for terrestrial biodiversity that are covered by protected areas shows temporal trends in the mean percentage of each important site for terrestrial biodiversity (i.e., those that contribute significantly to the global persistence of biodiversity) that is covered by designated protected areas.

Average proportion of Freshwater Key Biodiversity Areas (KBAs) covered by protected areas (%) (15.1.2): Proportion of important sites for freshwater biodiversity that are covered by protected areas shows temporal trends in the mean percentage of each important site for freshwater biodiversity (i.e., those that contribute significantly to the global persistence of biodiversity) that is covered by designated protected areas.

Average proportion of Mountain Key Biodiversity Areas (KBAs) covered by protected areas (%) (15.4.1): Coverage by protected areas of important sites for mountain biodiversity shows temporal trends in the mean percentage of each important site for mountain biodiversity (i.e., those that contribute significantly to the global persistence of biodiversity) that is covered by designated protected.

World Energy Balances (https://www.iea.org/statistics), **International Energy Agency (IEA), United Nations Statistics Division (UNSD), United Nations' Interagency Mechanism on Energy (UN Energy), International Renewable Energy Agency (IRENA)**
Renewable energy share in the total final energy consumption (%) (7.2.1): The renewable energy share in total final consumption is the percentage of final consumption of energy that is derived from renewable resources.

Energy intensity measured in terms of primary energy and GDP (7.3.1): Energy intensity is defined as the energy supplied to the economy pet unit value of economic output.

World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (http://www.fao.org/wiews), **Food and Agriculture Organization of the United Nations (FAO)**
Plant breeds for which sufficient genetic resources are stored (number) (2.5.1): The conservation of plant genetic resources for food and agriculture (GRFA) in medium or long term conservation facilities (ex situ in genebanks) represents the most trusted means of conserving genetic resources worldwide. The two components of the indicator, plant and animal GRFA, are separately counted. The plant component is calculated as the number of accessions of plant genetic

resources secured in conservation facilities under medium or long term conditions, where an 'accession' is defined as a distinct sample of seeds, planting materials or plants which is maintained in a genebank. Genebank Standards for Plant Genetic Resources for Food and Agriculture, set the benchmark for current scientific and technical best practices for conserving plant genetic resources, and support key international policy instruments for the conservation and use of plant genetic resources. These voluntary standards have been endorsed by the FAO Commission on Genetic Resources for Food and Agriculture at its Fourteenth Regular Session.

10YFP National Focal Points (http://www.oneplanetnetwork.org/), **United Nations Environment Programme (UNEP)**

Countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or target into national policies (1 = YES; 0 = NO) (12.1.1): This indicator allows for the quantification and monitoring of countries making progress along the policy cycle of binding and non-binding policy instruments aimed at supporting Sustainable Consumption and Production.

References

African Development Bank Group (2000). *Evaluation of the Performance and Effectiveness of the African Develpoment Bank's Environmental Policy and Environmental Assessment Procedure* https://www.afdb.org/fileadmin/uploads/afdb/Documents/Evaluation-Reports-_Shared-With-OPEV_/00157919-EN-EVALUATION-ENVIRONMENTAL-POLICY.PDF.

African Union, Economic Commission for Africa, African Development Bank and United Nations Development Programme (2017). *2017 Africa Sustainable Development Report: Tracking Progress on Agenda 2063 and the Sustainable Development Goals.* Addis Ababa. https://www.uneca.org/sites/default/files/PublicationFiles/en_agenda2063_sdg-web.pdf.

American Red Cross. (2012). *Vietnam Disaster Risk Reduction Programming* https://www.flickr.com/photos/americanredcross/8284538457/. Accessed 07 February 2019.

Angel, S., Blei, A.M., Parent, J., Lamson-Hall, P. and Sánchez, N.G. (2016). *Atlas of Urban Expansion—2016 Edition, Volume 1: Areas and Densities.* New York: New York University, United Nations Human Settlements Programme, Lincoln Institute of Land Policy

Ashden. (2010). *Mbale Solar Now Shop - Stephen Meana demonstrates lamps to potential customer – 2.* The Rural Energy Foundation. https://www.flickr.com/photos/ashdenawards/4799393910/. Accessed 06 February 2019.

Asian Development Bank (2018). *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific.* Mandaluyong City https://www.adb.org/sites/default/files/institutional-document/435391/strategy-2030-main-document.pdf

Breitburg, D., Levin, L.A., Oschlies, A., Grégoire, M., Chavez, F.P., Conley, D.J., Garçon, V., Gilbert, D., Gutiérrez, D., Isensee, K. and Jacinto, G.S. (2018). Declining Oxygen in the Global Ocean and Coastal Waters. *Science* 359(6371) 10.1126/science.aam7240.

Bringezu, S., Clement, J., Hatfield-Dodds, S., Hellweg, S., Oberle, B., Schandl, H. and Cabernard, L., Che, N., Droz-Georget , H., Ekins, P., Fischer-Kowalski, M., Flörke, M., Frank, S., Froemelt , A., Geschke, A., Haupt , M., Havlik, P., Hufner, R., Lenzen, M., Lieber, M., Lu, Y., Lutter, S., Mehr , J., Miatto, A., Newth, D., Oberschelp , C., Obersteiner, M., Pfister, S., Piccoli, E., Schaldach, R., Schüngel, J., Sonderegger, T., Sudheshwar, A., Tanikawa, H., van der Voet, E., Walker, C., West, J., Wang, Z. (2019) *Global Resource Outlook 2019: Natural Resources for the Future We Want*. United Nations Environment Programme.

Burnett R, Chen H, Szyszkowicz M, Fann N, Hubbell B, Pope CA 3rd *et al.* (2018). Global estimates of mortality associated with long-term exposure to outdoor fine particulate matter. *PNAS* 115(38), 9592-9597 10.1073/pnas.1803222115.

Caldeira, K. and Wickett, M.E. (2003). Oceanography: Anthropogenic Carbon and Ocean pH. *Nature* 425(6956), 365. 10.1038/425365a

Carothers, T. and Brechenmacher, S. (2014). *Accountability, Transparency, Participation, and Inclusion: A New Development Consensus?* Washington, D.C.: Carnegie Endowment for International Peace https://carnegieendowment.org/files/development_consensus_brief.pdf.

Champions 12.3 (2018). *SDG Target 12.3 on Food Loss and Waste: 2018 Progress Report* https://champions123.org/wp-content/uploads/2018/09/18_WP_Champions_ProgressUpdate_final.pdf.

Climate Investment Fund (2017). Forest Investment Program Results. https://www.climateinvestmentfunds.org/results/fip-results.

Climate Policy Initiative, https://www.oecd.org/environment/cc/OECD-CPI-Climate-Finance-Report.pdf

Condor Trekkers. (2015). *Non-profit Organization, Condor Trekkers, touring in Sucre, Bolivia* https://www.flickr.com/photos/visitorg/33764505483/. Accessed 07 February 2019.

Dalberg (2017). *System-Wide Outline of the Functions and Capacities of the UN Development System* United Nations. https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/en/qcpr/sg-report-dalberg_unds-outline-of-functions-and-capacities-june-2017.pdf.

Dave. (2017). *Sprouting Trillium.* https://www.flickr.com/photos/stayamused/33404925926/in/photolist-STSYEJ-27g2B4f-2bEbugw-7CDBgi-Y4ghxC-8Fq9ho-aDg1fg-dAAfEH-29f3USs-Mc8Zbk-dTdfpB-2ceCwGp-2bs9wFh-aQeGUe-CGe6x-bBtDes-FcYFLa-29Zs8CJ-bhebW8-KDA8b7-27g1B85-Jujnux-2cFEfrs-aJ69zX-U883HV-YMj7YY-nggddg-S1vcth-JdRcQ-87iw8b-aZhPm8-Y1T5jL-8dDgZ7-2dfoKrA-byXoep-r3WvZu-bEqp3h-MfUPdg-HQ14Rt-6et3cu-LAxNBN-2beU7am-dc274x-2bnxEcp-9JsLKq-ZEXGcb-2cHU8nW-RutJnL-5k6MwL-2eC73EW. Accessed 28 February 2019.

Department of Foreign Affairs and Trade. (2012). *Disaster Recovery.* https://www.flickr.com/photos/dfataustralianaid/10692636716/. Accessed 28 February 2019.

Duxbury, N., Hosagrahar, J. and Pascual, J. (2016). *Why must culture be at the heart of sustainable urban development?* Agenda 21 for culture Barcelona: United Cities and Local Governments. http://www.agenda21culture.net/sites/default/files/files/documents/en/culture_sd_cities_web.pdf.

Dyck, A.J. and Sumaila, U.R. (2010). Economic impact of ocean fish populations in the global fishery. *Journal of Bioeconomics* 12, 227-243. 10.1007/s10818-010-9088-3

European Commission's Joint Research Centre (2014). *Land Productivity Dynamics*. [https://wad.jrc.ec.europa.eu/landproductivity.

European Environment Agency (2018). *Environmental indicator report 2018 In support to the monitoring of the Seventh Environment Action Programme.* Luxembourg. https://www.eea.europa.eu/publications/environmental-indicator-report-2018.

European Union (2017). *Sustainable Development in the European Union Overview of progress towards the SDGs in an EU context.* Luxembourg. https://ec.europa.eu/eurostat/documents/4031688/8461538/KS-01-17-796-EN-N.pdf/f9c4e3f9-57eb-4f02-ab7a-42a7ebcf0748.

Eurostat (2018). Sustainable Development Publications [https://ec.europa.eu/eurostat/web/sdi/publications.

Feely, R.A., Sabine, C.L., Lee, K., Berelson, W., Kleypas, J., Fabry, V.J. and Millero, F.J. (2004). Impact of Anthropogenic CO_2 on the CaCO3 System in the Oceans. *Science* 305(5682), 362-366.

Food and Agriculture Organization of the United Nations (2011). Global food losses and food waste – Extent, causes and prevention. Rome. http://www.fao.org/3/a-i2697e.pdf.

Food and Agriculture Organization of the United Nations (2012). Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security. Rome. http://www.fao.org/docrep/016/i2801e/i2801e.pdf..

Food and Agriculture Organization of the United Nations (2014). *Building a common vision for sustainable food and agriculture Principles and Approaches.* Rome. http://www.fao.org/3/a-i3940e.pdf.

Food and Agriculture Organization of the United Nations (2015). Food Wastage Footprint and Climate Change. Rome. http://www.fao.org/3/a-bb144e.pdf.

Food and Agriculture Organization of the United Nations (2016). *FAO yearbook: Fishery and aquaculture statistics.* Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/3/i9942t/I9942T.pdf.

Food and Agriculture Organization of the United Nations (2017). FAO and the SDGs Indicators: Measuring up to the 2030 Agenda for Sustainable Development. Rome. http://www.fao.org/3/a-i6919e.pdf.

Food and Agriculture Organization of the United Nations (2018). *Sustainable Development Goals Mountain Green Cover*. [Food and Agriculture Organization of the United Nations http://www.fao.org/sustainable-development-goals/indicators/1542/en/.

Food and Agriculture Organization of the United Nations and United Nations Water (2018). Progress on Water-use Efficiency: Piloting the monitoring methodology and initial findings for SDG indicator 6.4.1.

Framework Convention on Climate Change FCCC/SBI/2018/INF.8 (2018). Compilation and synthesis of third biennial reports of Parties included in Annex I to the Convention United Nations. https://unfccc.int/sites/default/files/resource/inf8.pdf

Frankfurt School of Finance and Management (2018). *Global Trends in Renewable Energy Investment 2018.* http://www.iberglobal.com/files/2018/renewable_trends.pdf.

Freire, C. (2017). *Splash.* https://www.flickr.com/photos/crisfreirefoto/27564403819/. Accessed 28 February 2019.

Ginsu, Y. (2016). *Volcano Ash Cloud.* https://unsplash.com/photos/qexZLgMcbPc/info. Accessed 27 February 2019.

Government of Alberta. (2014). *Flood Mitigation Project.* https://www.flickr.com/photos/governmentofalberta/16823111100/. Accessed 06 February 2019.

Green Climate Fund (2018). *Resource Mobilization*. Incheon https://www.greenclimate.fund/how-we-work/resource-mobilization

Haas, W., Krausmann, F., Wiedenhofer, D. and Heinz, M. (2015). How Circular is the Global Economy?: An Assessment of Material Flows, Waste Production, and Recycling in the European Union and the World in 2005. *Journal of Industrial Ecology* 19(5), 765-777. 10.1111/jiec.12244

Haque, U., Hashizume, M., Kolivras, K.N., Overgaard, H.J., Das, B. and Yamamoto, T. (2012). *Reduced death rates from cyclones in Bangladesh: what more needs to be done?* Table 1. Cyclone severity and deaths in Bangladesh 1960–2010Bulletin of the World Health Organization 90:150-156.

Hoffmann, M., Brooks, T.M., Butchart, S.H.M., Gregory, R.D., and McRae, L. (2018). Trends in Biodiversity: Vertebrates Reference Module in Earth Systems and Environmental Sciences. *Encyclopedia of the Anthropocene* 3, 175-184. https://doi.org/10.1016/B978-0-12-809665-9.09963-8.

Inter-American Development Bank (2018). Environment in Latin America and the Caribbean. [https://www.iadb.org/en/topics/environment/environment-in-latin-america-and-the-caribbean%2C1663.html.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2018). *Summary for Policymakers of the IPBES Regional Assessment Report on Biodiversity and Ecosystem Services for Asia and the Pacific* Bonn.

International Council for Science (2017). *A Guide to SDG Interactions: from Science to Implementation.* Paris. https://council.science/cms/2017/05/SDGs-Guide-to-Interactions.pdf.

International Energy Agency (2018a). *Market Report Series: Energy Efficiency 2018 Analysis and Outlooks to 2040.* http://www.sipotra.it/wp-content/uploads/2018/11/Energy-efficiency-2O18.pdf.

International Energy Agency (2018b). https://webstore.iea.org/world-energy-balances-2018.

International Union for Conservation of Nature (2017). *Marine Protected Areas and Climate Change* https://www.iucn.org/sites/dev/files/mpas_and_climate_change_issues_brief.pdf.

International Union for Conservation of Nature Commission on Ecosystem Management (2017). IUCN Red List of Ecosystems. [http://iucnrle.org/assessments/ (Accessed: 5 October 2017.

Ishan. (2017). *City of the Future.* https://unsplash.com/photos/xnABlJs2D7k. Accessed 28 February 2019.

Jace and Afsoon. (2016). *Bicycles in Amsterdam.* https://unsplash.com/photos/VEXIwDcY1gw. Accessed 06 February 2019.

Janssens-Maenhout, G., Crippa, M., Guizzardi, D., Muntean, M., Schaaf, E., Olivier, J.G.J. *et al.* (2017). *Fossil CO_2 and GHG emissions of all world countries.* Luxembourg. http://edgar.jrc.ec.europa.eu/booklet2017/CO_2_and_GHG_emissions_of_all_world_countries_booklet_online.pdf.

Jon (2013). *Emissions in front of Mt. Baker, Washington, Weaverling Spit on the Tommy Thompson Trail Causeway.* https://www.flickr.com/photos/-jon/11091350446/in/photolist-hU7557-ggv5a1-KZctPS-oGLuA4-au2Xek-GxTc1t-atTqic-dDrgnF-dDrm1M-aqJVpT-2ehh51G-nZFQUU-aAdNwp-fQ6jto-WqbPBJ-pZAJYY-dRUbwa-Sh6FTm-4hSYsA-dyBvDe-oVyHA6-nSn8jR-VbYw6a-HuVdjR-GgYxPh-21RmiE3-dDobAJ-o99YHR-b3b1Az-fuBNRn-95boTR-WY4LHg-hJBgnr-8kR3To-Cyzfry-UApRpP-e1tjms-nTgXjt-rdEY4i-cBwCLU-qB8bER-cZ6cGN-p2KX96-ht4eVn-CpqKvF-fb2aQ7-7K3MEa-iHUHAA-oxH5Bk-L9Q8oP. Accessed 06 February 2019.

Jun-ho, K. (2018). Prohibited use of disposable envelopes from New Year's ... Penalty of 3 million won. [WebDaily http://m.webdaily.co.kr/view.php?ud=20181231134753772 59d488cea5c_7#_enliple2019).

Kaza, S., Yao, L.C., Bhada-Tata, P. and Van Woerden, F. (2018). *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050.* Washington, D.C. https://openknowledge.worldbank.org/handle/10986/30317.

Kershaw, P., Katsuhiko, S., Lee, S., Leemseth, J. and Woodring, D. (2011). Plastic Debris in the Ocean. UNEP year book: emerging issues in our global environment.

Krivec, A. (2014). *Timber in a Forest* https://unsplash.com/photos/Bb4C0IwSoW4/info. Accessed 28 February 2019.

Kumar, R., Quan, J. and Mboup, G. (2017). *A multi-country capacity assessment of national statistical offices preparedness to report on SDG indicator 1.4.2, Global status on land tenure security data collection, analysis and on comparable indicators in the SDGs.* Chatham: United Nations Human Settlements Programme, http://gala.gre.ac.uk/20134/7/20134%20QUAN_A%20Multi-Country_Capacity_Assessment_of%20NSO_Preparedness_to%20Report_on_SDG_2021.pdf.

Land Portal (2014). Restricted Resources and Entitlements - Woman Access to Land. Social Institutions and Gender Index. Organisation for Economic Co-operation and Development, https://landportal.org/book/indicators/indoecd11-0

Land Portal (2017). *% of Indigenous and Community Lands - Not formally recognised*. [https://landportal.org/book/indicator/lmm-picl-3nfr.

Lebada, A. (2018). *First Countries Report on Genetic Resources Use under Nagoya Protocol*. [International Institute for Sustainable Development https://sdg.iisd.org/news/first-countries-report-on-genetic-resources-use-under-nagoya-protocol/.

Lewis, E. (2017). *Updated analysis of the extent to which marine ecoregions are covered by protected areas*. [United Nations Environment Programme World Conservation Monitoring Center and International Union for Conservation of Nature www.protectedplanet.net (Accessed: December 2018.

McCullough, R. (2019). *Untitled.* https://unsplash.com/photos/UObdhwSso5o/info. Accessed 28 February 2019.

Mora, C., Wei, C.L., Rollo, A., Amaro, T., Baco, A.R., Billett, D., Bopp, L., Chen, Q., Collier, M., Danovaro, R. and Gooday, A.J. (2013). Biotic and Human Vulnerability to Projected Changes in Ocean Biogeochemistry over the 21st Century. 10 edn: PLoS Biology. 10.1371/journal.pbio.1001682

Ness, J. (2016). Untitled. https://unsplash.com/photos/JcFdDK73NBI/info. Accessed on 28 February 2019.

Nilsson, M., Griggs, D. and Visbeck, M. (2016). Policy: Map the interactions between Sustainable Development Goals. Nature 534(7607), 320-322. https://www.nature.com/news/policy-map-the-interactions-between-sustainable-development-goals-1.20075.

Not an Atlas (2018). The Environmental Justice Atlas: Mapping Global Environmental Conflicts and Spaces of Resistance. https://www.notanatlas.org/maps/the-environmental-justice-atlas/?pdf=3063.

Online Education. (2006). *Education.* https://www.flickr.com/photos/online_education/6368447587/. Accessed 28 February 2019.

Organisation for Economic Co-operation and Development (2015). *Climate Finance in 2013-14 and the USD 100 billion goal*. Organisation for Economic Co-operation and Development

Organisation for Economic Co-operation and Development and International Energy Agency (2017). *Energy Access Outlook 2017: from Poverty to Prosperity*

Parra, A. (2017). *Coffee Plantation.* https://www.flickr.com/photos/148273886@N08/34598432720/in/photolist-UHm1E5-8AVzYT-2dt5Zqf-bj64iZ-28nMwXj-aAefXi-bd6EGp-8dVr7i-Rg8kJG-bBgWyX-eRLPw9-g4AYhE-dWo8bZ-7aAh3A-as5om7-qDWgDk-HVpYQF-DTAwfD-gYbJNL-btruoD-9CVtcA-9vaai4-2ca8zBy-dFMgpB-ZqpwtF-RR7S3W-9numyE-bErirq-sJAVR-8Bys7X-4CELMJ-VM5E3b-hTuHHe-JGcLr-2esvnvK-YQptJL-WuFGfw-V29bpf-bSXHxr-dFSFSA-H9wGCF-bxbuNE-nArn2Y-dFMev4-2dUxNVw-eRnnZj-dFMdJp-66wgur-9sWZYi-9sWZKH Accessed 06 February 2019.

Pauly, D. and Lam, V.W.Y. (2016). Chapter 6.1: The status of fisheries in large marine ecosystems 1950-2010. In *Large Marine Ecosystems: Status and Trends.* Nairobi: United Nations Environment Programme. chapter 6.1. 113-137.

Phartiyal, S. and Jadhav, R. (2018). *Amazon, HandM and other multinationals pressing to soften Indian state's plastic ban*. [Reuters https://www.reuters.com/article/us-india-plastic-ban/amazon-hm-and-other-multinationals-pressing-to-soften-indian-states-plastic-ban-idUSKBN1JP0BU2019).

Pregadio, J. (2018). *Untitled.* https://unsplash.com/photos/7XrTzdZkP6E. Accessed 28 February 2019.

Prokosch, P. (2019). *Photo Library*. [GRID-Arendal http://old.grida.no/photolib/portfolio/0c67cdc9-0590-459e-a428-1a1a34e811c3?p=10.

Rabalais, N.N., Cai, W.-J., Carstensen, J., Conley, D.J., Fry, B., Hu, X. *et al.* (2015). Eutrophication-Driven Deoxygenation in the Coastal Ocean. *Oceanography* 27(1), 172-183 10.5670/oceanog.2014.21

Rawpixel (2018). *Sustainable Research*. https://unsplash.com/photos/ij3DVxU7qbc. Accessed 11 February 2019.

Rawpixel. (2018). *Untitled.* https://unsplash.com/photos/w9YHKTK-wLo. Accessed 28 February 2019.

Renewable Energy Policy Network for the 21st Century (2018). *Renewables 2018 Global Status Report* Paris http://www.ren21.net/wp-content/uploads/2018/06/17-8652_GSR2018_FullReport_web_-1.pdf.

Revision Byte. (2019). *Economy.* https://www.flickr.com/photos/160439602@N07/32717768538/. Accessed 28 February 2019.

Ritchie, R., Mispy, Ortiz-Ospina (2018). Measuring progress towards the Sustainable Development Goals, Goal 15. https://sdg-tracker.org/biodiversity

Rochman, C.M., Browne, M.A., Underwood, A.J., Franeker, J.A.V., Thompson, R.C. and Amaral-Zettler, L.A. (2016). The ecological impacts of marine debris: unraveling the demonstrated evidence from what is perceived. *Ecology* 97(2), 302-312. https://www.ncbi.nlm.nih.gov/pubmed/27145606.

Rode, J., Wittmer, H., Watfe, G. (2012). *Implementation Guide for Aichi Target 2 – A TEEB perspective.* German Federal Agency for Nature Conservation (BfN) http://www.teebweb.org/publication/implementation-guide-for-aichi-target-2-a-teeb-perspective/.

Rusev, C. (2019). *Unnamed Road.* https://unsplash.com/photos/Fs_Ed1Mf_Oo/info. Accessed 28 February 2019.

Ryan, P.G. (2015). A Brief History of Marine Litter Research Bergmann, M., Gutow, L. and Klages, M. *Marine Anthropogenic Litter* Springer, 1-25 https://link.springer.com/chapter/10.1007/978-3-319-16510-3_1

Sandner, D. (2013). *Sun.* https://www.flickr.com/photos/96831880@N05/8926001598/. Accessed 28 February 2019.

Schwaerzler, J. (2017). *Road After a Sandstorm.* https://unsplash.com/photos/H1jf2rrg2BI/info Accessed 06 February 2019.

Schwanen, T., Lucas, K., Akyelken, N., Solsona, D.C., Carrasco, J.-A. and Neutens, T. (2015). Rethinking the links between social exclusion and transport disadvantage through the lens of social capital. Transportation Research Part A: Policy and Practice 74, 123-135. http://eprints.whiterose.ac.uk/83769/1/Schwanen%20et%20al%202015.pdf.

Sea Around Us (2016). Fisheries, Ecosystems, and Biodiversity. [University of British Columbia http://www.seaaroundus.org

Secretariat of the Convention for Biodiversity (2014). *About the Nagoya Protocol*. [United Nations Environment Programme https://www.cbd.int/abs/about/.

Secretariat of the Convention for Biodiversity (2016). *Analysis of Targets Established by Parties and Progress Towards the Aichi Biodiversity Targets.* Nairobi: United Nations Environment Programme. https://www.cbd.int/doc/c/e24a/347c/a8b84521f326b90a198b1601/sbi-02-02-add2-en.pdf.

Secretariat of the Convention for Biodiversity (2017a). *Types of Information Available*. [United Nations Environment Programme https://absch.cbd.int/about/infoTypes.

Secretariat of the Convention for Biodiversity (2017b). Legislative, Administration, Policy Measure. [United Nations Environment Programme https://absch.cbd.int/search/nationalRecords?schema=measure.

Shutov, M. (2018). *Boardwalk* https://unsplash.com/photos/e7CGJYYqoCY/info. Accessed 28 February 2019.

Spratt, A. (2016). *Tropical Mother and Child.* https://unsplash.com/photos/1YnBzhJlSg4. Accessed 28 February 2019.

Statistics Canada (2018). *Environmental indicators*. [https://www.canada.ca/en/environment-climate-change/services/environmental-indicators.html.

Sweet Ice Cream. (2016). *NYC Pyramid.* https://unsplash.com/photos/QotTbY0b4YM/info. Accessed 28 February 2019.

Tatiana. (2019). *Globe.* https://www.flickr.com/photos/168991807@N06/31994734077/. Accessed 28 February 2019.

The Biodiversity Indicators Partnership (2018). *Biodiversity Indicators Partnership*. [BIP Secretariat https://www.bipindicators.net/.

The British Columbia Council for International Cooperation (2018). *Measuring Up: How Does Canada Compare on Sustainable Development?* [https://www.bccic.ca/measuring-up/.

The International Energy Agency, The International Renewable Energy Agency, The United Nations Statistics Division, The World Bank and The World Health Organization (2018). *Tracking SDG 7 Progress Report*. [https://trackingsdg7.esmap.org/2019).

The Roaming Platypus. (2017). *Warm & Cold.* https://unsplash.com/photos/EJ4qfFp1g8Q. Accessed 28 February 2019.

The Sustainable Development Goals Center for Africa and Sustainable Development Solutions Network (2018). *Africa SDG Index and Dashboards Report 2018.* Kigali, New York. http://unsdsn.org/wp-content/uploads/2018/07/AFRICA-SDGS-2018-Complete-Report-WEB.pdf.

Transboundary Waters Assessment Programme (2019). *One Shared Ocean*. [http://onesharedocean.org/lmes.

United Nations (2002). *Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects.* http://www.un.org/depts/los/global_reporting/Background_to_the_Regular_Process.pdf.

United Nations (2015). *Paris Agreement.* https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

United Nations (2016). *Mobilizing Sustainable Transport for Development: Analysis and Policy Recommendation from the United Nations Secretary-General's High-Level Advisory Group on Sustainable Transport.* New York City. https://sustainabledevelopment.un.org/content/documents/2375Mobilizing%20Sustainable%20Transport.pdf.

United Nations (2018a). *Tier Classification for the SDG Indicators.* New York, NY. https://unstats.un.org/sdgs/files/Tier%20Classification%20of%20SDG%20Indicators_31%20December%202018_web.pdf.

United Nations (2018b). Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean. Escazu https://repositorio.cepal.org/bitstream/handle/11362/43583/1/S1800428_en.pdf

United Nations (2018c). *Sustainable Development Goals Report 2018.* Nairobi: United Nations. https://unstats.un.org/sdgs/files/report/2018/TheSustainableDevelopmentGoalsReport2018-EN.pdf.

United Nations Office for Disaster Risk Reduction (2017). *Sendai Framework for Disaster Risk Reduction* [https://sendaimonitor.unisdr.org/analytics/global-target/13/6.

United Nations and Economic Commission for Latin America and the Caribbean (2018). *Social Panorama of Latin America.* Santiago. https://repositorio.cepal.org/bitstream/handle/11362/42717/6/S1800001_en.pdf.

United Nations and The United Nations Educational, Scientific and Cultural Organization (2018). Progress on Transboundary Water Cooperation for SDG indicator 6.5.2. United Nations Educational, Scientific and Cultural Organization, Paris

United Nations Committee of Experts on Global Geospatial Information Management (2017). IAEG-SDGs: Working Group on Geospatial Information Results of Analysis of the Global Indicator Framework with a "geographic-location" lens. http://ggim.un.org/ggim_20171012/docs/meetings/GGIM7/Agenda%2012%20-%20Initial%20short-list%20(Review%20of%20global%20indicator%20framework%20with%20geographic%20lens).pdf.

United Nations Conference on Trade and Development (2007). *Target 15.9: Ecosystems and biodiversity*. [https://stats.unctad.org/Dgff2016/planet/goal15/target_15_9.html#ref_SecretariatOfTheConventionOnBiologicalDiversity2014.

United Nations Conference on Trade and Development (2015). Target 17.14: Policy coherence. https://stats.unctad.org/Dgff2016/partnership/goal17/target_17_14.html.

United Nations Conference on Trade and Development (2016). *Target 14.7: Sustainable use of marine resources*. [https://stats.unctad.org/Dgff2016/planet/goal14/target_14_7.html.

United Nations Convention on the Law of the Sea, 1982 (United Nations). http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

United Nations Economic and Social Commission for Asia and the Pacific (2017). *Regional Road Map for Implementing the 2030 Agenda for Sustainable Development in Asia and the Pacific.* Bangkok. https://www.unescap.org/sites/default/files/publications/SDGs-Regional-Roadmap.pdf.

United Nations Economic and Social Commission for Asia and the Pacific (2018). *Statistical Perspectives 2018: Sustainable Energy in Asia and the Pacific.* Bangkok. https://www.unescap.org/sites/default/files/Statistical%20Perspective%202018%20WEB.pdf.

United Nations Economic and Social Council (2018). *Progress Towards the Sustainable Development Goals.* https://sustainabledevelopment.un.org/content/documents/18541SG_SDG_Progress_Report_2018_ECOSOC.pdf.

United Nations Economic Commission for Europe (2016a). *Greening the economy in the pan-European region*. [https://www.unece.org/fileadmin/DAM/env/greeneconomy/GreenEconomy_1page_July_2016/ece.batumi.conf.2016.4.e.pdf.

United Nations Economic Commission for Europe (2016b). *Batumi Action for Cleaner Air (BACA)* [https://www.unece.org/environmental-policy/environment-for-europe/initiatives/baca.html.

United Nations Educational Scientific and Cultural Organization (2018). *Progress on Education for Sustainable Development and Global Citizenship Education.* Paris. https://unesdoc.unesco.org/ark:/48223/pf0000266176.

United Nations Educational Scientific and Cultural Organization (1974). *Recommendation concerning education for international understanding, co-operation and peace and education relating to human rights and fundamental freedoms.* Paris. http://www.unesco.org/education/nfsunesco/pdf/Peace_e.pdf.

United Nations Educational Scientific and Cultural Organization (2017). *Education for Sustainable Development Goals Learning Objectives.* Paris. https://unesdoc.unesco.org/ark:/48223/pf0000247444.

United Nations Educational Scientific and Cultural Organization (2009). *2009 UNESCO Framework for Cultural Statistics.* Montreal. http://uis.unesco.org/sites/default/files/documents/unesco-framework-for-cultural-statistics-2009-en_0.pdf.

United Nations Educational Scientific and Cultural Organization (2016a). *The Sixth Consultation on the implementation of the Recommendation concerning Education for International Understanding, Cooperation and Peace and Education relating to Human Rights and Fundamental Freedoms (1974).* https://unesdoc.unesco.org/ark:/48223/pf0000245155.

United Nations Educational Scientific and Cultural Organization (2016b). *The Sixth Consultation on the implementation of the Recommendation concerning Education for International Understanding, Cooperation and Peace and Education relating to Human Rights and Fundamental Freedoms (1974).* https://unesdoc.unesco.org/ark:/48223/pf0000245155.

United Nations Educational Scientific and Cultural Organization (2010). *Climate Change Education for Sustainable Development.* Paris. https://unesdoc.unesco.org/ark:/48223/pf0000190101.

United Nations Educational Scientific and Cultural Organization (2016c). *The Leapfrogging Opportunity: Role of Education in Sustainable Development and Climate Change Mitigation.* https://unesdoc.unesco.org/ark:/48223/pf0000245615.locale=en.

United Nations Educational Scientific and Cultural Organization (2018b). *Global Reporting on Climate Change Education.* Paris. https://en.unesco.org/sites/default/files/climate_change_edu_n_chopin.pdf.

United Nations Environment Assembly of the UNEP UNEP/EA.2/Res.4 (2016). Delivering on the 2030 Agenda for Sustainable Development United Nations Environment Programme. http://wedocs.unep.org/bitstream/handle/20.500.11822/11179/K1607137_UNEPEA2_RES4E.pdf?sequence=1andisAllowed=y

United Nations Environment Assembly UNEP/EA.3/INF/5 (2017). Combating marine plastic litter and microplastics: An assessment of the effectiveness of relevant international, regional and subregional governance strategies and approaches United Nations Environment Programme. https://papersmart.unon.org/resolution/uploads/unea-3_mpl_assessment-2017oct05_unedited_adjusted.pdf

United Nations Environment Programme (2015). *Target 2 Aichi Biodiversity Targets*. [United Nations Environment Programme https://www.informea.org/en/goal/target-2-0

United Nations Environment Programme (2016a). *Sustainable Development in Practice: Applying an integrated approach experiences in Latin America and the Caribbean.* Panama City http://www.pnuma.org/documentos/UNEP_Sustainable%20Development%20ENG%20WEB%20OK.pdf.

United Nations Environment Programme (2016b). *GEO-6 Regional Assessment for North America.* Nairobi.

United Nations Environment Programme (2016c). *GEO-6 Regional Assessment for Latin America and the Caribbean.* Nairobi.

United Nations Environment Programme (2016d). *A Snapshot of the World's Water Quality: Towards a global assessment.* Nairobi. https://uneplive.unep.org/media/docs/assessments/unep_wwqa_report_web.pdf.

United Nations Environment Programme (2016e). *Transboundary River Basins Status and Trends.* Nairobi. http://wedocs.unep.org/bitstream/handle/20.500.11822/19666/GEF_TWAPRB_TableOfContents.pdf?sequence=1andisAllowed=y.

United Nations Environment Programme (2017a). *Asia Waste Management Outlook.* http://www.rrcap.ait.asia/Publications/Asia%20Waste%20Management%20Outlook.pdf.

United Nations Environment Programme (2017b). *Factsheets on sustainable public procurement in national governments.* Nairobi. http://www.oneplanetnetwork.org/resource/factsheets-sustainable-public-procurement-national-governments.

United Nations Environment Programme (2017c). *2017 Global Review of Sustainable Public Procurement.* Nairobi. http://web.unep.org/ourplanet/october-2017/unep-publications/2017-global-review-sustainable-public-procurement.

United Nations Environment Programme (2018a). Committee of Permanent Representatives Subcommittee Meeting *Committee of Permanent Representatives*. 20 September. Nairobi https://www.unenvironment.org/events/subcommittee-meetings/committee-permanent-representatives-subcommittee-meeting-14

United Nations Environment Programme (2018b). *The Integrated Approach and the Environmental Dimension in the 2030 Agenda.* Panama City http://cepei.org/wp-content/uploads/2018/10/Cepei_UN-Enfoque-integrado-IN-V03-1-1.pdf.

United Nations Environment Programme (2018c). *Progress on Ambient Water Quality, Piloting the monitoring methodology and initial findings for SDG indicator 6.3.2, 2018.* Nairobi.

United Nations Environment Programme (2018d). *2018 Emissions Gap Report.* http://wedocs.unep.org/bitstream/handle/20.500.11822/26896/EGR-KEYMESSAGES_2018.pdf?sequence=1andisAllowed=y.

United Nations Environment Programme (2018e). *Goal 15 Life on Land*. [United Nations Environment Programme https://www.un.org/sustainabledevelopment/biodiversity/.

United Nations Environment Programme (2019a) *Global Environmental Outlook - GEO 6: Healthy Planet, Healthy People*.

United Nations Environment Programme (2019b) *Environment Live* [https://environmentlive.unep.org/.

United Nations Environment Programme (2019c) *UNEP Live Global database aggregation methods.* United Nations Environment Programme. https://uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf.

United Nations Environment Programme (2019d) *Measuring Gender and Environment*.

United Nations Environment Programme (2019e) *Trade in Environmentally Sound Technologies: Implications for Developing Countries*. United Nations Environment Programme

United Nations Environment Programme and Centro de Pensamiento Estratégico Internacional (2018). *Environmental Governance and the 2030 Agenda Progress and Good Practices in Latin America and the Caribbean.* Panama City. https://wedocs.unep.org/bitstream/handle/20.500.11822/26756/Governance_2030_LAC.pdf?sequence=4andisAllowed=y.

United Nations Environment Programme and United Nations Economic Commission for Europe (2016). *GEO-6 Assessment for the pan-European region (rev. 1).* Nairobi. https://uneplive.unep.org/media/docs/assessments/GEO_6_Assessment_pan_European_region.pdf.

United Nations Environment Programme and World Tourism Organization (2005). *Making Tourism More Sustainable: A Guide for Policy Makers* Paris, Madrid. http://www.unep.fr/shared/publications/pdf/dtix0592xpa-tourismpolicyen.pdf.

United Nations Framework Convention on Climate Change (2017). *Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015–2030.* https://unfccc.int/resource/docs/2017/tp/03.pdf.

United Nations Framework Convention on Climate Change United Nations Climate Change [https://unfccc.int/ (Accessed: 19/12 2018).

United Nations General Assembly (2017a). Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development: resolution / adopted by the General Assembly A/RES/71/313. New York http://ggim.un.org/documents/A_RES_71_313.pdf

United Nations General Assembly (2017b). Preparatory process of the United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development. http://www.un.org/ga/search/view_doc.asp?symbol=A/71/733andLang=E.

United Nations General Assembly (2018). *Gaps in international environmental law and environment-related instruments: towards a global pact for the environment.* https://wedocs.unep.org/bitstream/handle/20.500.11822/27070/SGGaps.pdf?sequence=3andisAllowed=y.

United Nations Human Settlements Programme (2018a) *The first Arab Land Conference.* Arab Land Conference. Arab Land Conference Arab Land Conference. Dubai, 26 – 28 February.

https://arabstates.gltn.net/2018/10/09/first-arab-land-conference-2018-report/

United Nations Human Settlements Programme (2018b). *SDG 11 Synthesis Report 2018: Tracking progress towards Inclusive, Safe, Resilient and Sustainable Cities and Human Settlements.* Nairobi. https://unhabitat.org/sdg-11-synthesis-report-2018-on-cities-and-communities/.

United Nations Human Settlements Programme (2018c). *Developing Public Space and Land Values in Cities and Neighbourhoods.* Nairobi. https://unhabitat.org/developing-public-space-and-land-values-in-cities-and-neighbourhoods/.

United Nations Industrial Development Organization (2017). Industrial Development Report 2018. Demand for Manufacturing: Driving Inclusive and Sustainable Industrial Development. Overview Vienna. https://www.unido.org/sites/default/files/files/2017-11/IDR2018_FULL%20REPORT.pdf.

United Nations Inter-Agency Task Force on Illicit Trade in Wildlife and Forest Products (2017). *Africa-Asia Pacific Symposium on Strengthening Legal Frameworks to Combat Wildlife Crime.* Bangkok. https://www.unodc.org/documents/southeastasiaandpacific/Publications/wildlife/Africa-AsiaPac-Wildlife-law-symposium-REPORT-FINAL-SHARE.PDF.

United Nations Inter-Agency Task Force on Illicit Trade in Wildlife and Forest Products (2018). *Symposium on Strengthening Legal Frameworks to Combat Wildlife Crime in Central and West Africa* Abidjan.

United Nations International Children's Emergency Fund. (2013). *Typhoon Haiyan/Yolanda 14.* https://www.flickr.com/photos/unicefphils/10834106103/in/photolist-hvnChP-pMkvhD-qrG9MK-qPbyNB-qyApUZ-qMkqeY-hbEJLd-6LqAk9-pM7gaY-quVVma-qyr39U-gmTY34-qyzDKB-bRFuiK-aq4BnV-hvmcFQ-qFP8cw-aBreXR-qP71BC-hWrfTZ-qrEEkP-ngrydB-nxDkEe-hWqgN8-e1by6D-kHSqXa-7neVrZ-hWrc5X-hWqeYX-hWricX-kHRSYH-96oGMX-96azDL-hWqJRq-9Gic3w-hWqGY7-gmTYLZ-hWqQVj-hWquSe-hWqQeQ-qrF92R-qwJcoK-aBreT4-7neVoD-pMkdDi-pP2uDz-pP4A9N-nxDkQK-7neWpk-qwJnkt. Accessed 28 February 2019.

United Nations International Strategy for Disaster Reduction. (2012). *Disaster Risk Reduction in an urbanizing World.* https://www.flickr.com/photos/isdr/8756920743/. Accessed 28 February 2019.

United States Agency for International Development. (2006). *Health Care for Sick Babies.* https://www.flickr.com/photos/usaidafrica/5686758533/in/photolist-5FZWpN-5Gn18h-aqYzD5-aor6CM-7FV1Ps-7FR53n-945Xsx-945Z1v-a5RVNN-9MdzkU-9Ew8bV-9GgiTW-99t4HD Accessed 06 February 2019.

United States Government (2019) *U.S. National Statistics for the U.N. Sustainable Development Goals*. [https://sdg.data.gov/.

Valentin, S. (2017). *Colors of the Market.* https://unsplash.com/photos/2w42JGUOuLs/info. Accessed 28 February 2019.

Valentiny, I. and Rodriguez, J. (2016). *Poor air quality and climate change are the two greatest threats to human health in the pan-European region - says new UN report* 8 June https://www.unenvironment.org/news-and-stories/press-release/poor-air-quality-and-climate-change-are-two-greatest-threats-human.

Vasconcellos, W. J. (2018). *The Shore.* https://unsplash.com/photos/QkwonKi6zcY/info. Accessed 28 February 2019.

Wallace, J.S. (2000). Increasing agricultural water use efficiency to meet future food production. *Agriculture, Ecosystems and Environment* 82(1-3), 105-119. https://pdfs.semanticscholar.org/cdcb/d4447f604b2e1c95c513edab6d0a004224d9.pdf.

Weitz, N., Carlsen, H., Nilsson, M. and Skånberg, K. (2018). Towards systemic and contextual priority setting for implementing the 2030 Agenda. In Sustainability Science 13(2):531-548

Williams, D. (2016). Untitled. https://unsplash.com/photos/Kpepu2WpBTs. Accessed 01 March 2019.

Wilson, R. (2018). Untitled. https://unsplash.com/photos/HkF6feHrGBE. Accessed on 28 February 2019.

World Bank (2018). *Terrestrial Protected Areas (% of total land area)*. [The World Bank https://data.worldbank.org/indicator/ER.LND.PTLD.ZS.

World Bank. (2010). *Thermo-Solar Power Plant.* Morocco. https://www.flickr.com/photos/worldbank/4842166516/. Accessed 06 February 2019.

World Health Organization (2006). *Air Quality Guidelines.* http://www.euro.who.int/__data/assets/pdf_file/0005/78638/E90038.pdf?ua=1.

World Health Organization and United Nations Human Settlements Programme (2018). Progress on safe treatment and use of wastewater: piloting the monitoring methodology and initial findings for SDG indicator 6.3.1. Geneva. http://www.unwater.org/publications/progress-on-wastewater-treatment-631/

World Resources Institute. (2016). *Reforestation in Costa Rica.* https://www.flickr.com/photos/worldresourcesinstitute/32436039614/ Accessed 06 February 2019.

World Tourism Organization (2017). Sustained growth in international tourism despite challenges. http://www2.unwto.org/press-release/2017-01-17/sustained-growth-international-tourism-despite-challenges.

World Tourism Organization and United Nations Development Programme (2017). *Tourism and the Sustainable Development Goals – Journey to 2030.* Madrid. https://www.e-unwto.org/doi/pdf/10.18111/9789284419401.

World Travel and Tourism Council (2018). *Travel and Tourism Economic Impact 2018.* https://www.wttc.org/-/media/files/reports/economic-impact-research/regions-2018/world2018.pdf.

Zaval, L. and Cornwell, F.J. (2016). *Effective Education and Communication Strategies to Promote Environmental Engagement: The Role of Social-Psychological Mechanisms.* https://unesdoc.unesco.org/ark:/48223/pf0000245628.locale=en.

广博 郝J. (2017). *Untitled.* https://unsplash.com/photos/6XcziMmkNgQ. Accessed 28 February 2019.